Management for Professionals

Claudio A. Saavedra

The Marketing Challenge for Industrial Companies

Advanced Concepts and Practices

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Preface (Mandatory Reading)

At some point in the history of business, manufacturers came down with the same illness that afflicts merchants: they were taught to believe that the purpose of what they were doing was to make money. Merchants, like banks, buy cheap in order to sell high. For merchants, this is done through goods, while banks go through this same process using money. No doubt, both of these figures are central to the world as we know it today.

The manufacturer, however, brings something into the world that doesn't previously exist. At some point in their creative and vocational process, manufacturers have to be passionate about something that isn't money. New products are created precisely because they have to be; they're created in order to become a part of something larger, something that ultimately improves other people's lives and makes the designer proud. There is an element of artistry involved in this process.

One of the twentieth century's greatest thinkers on the subject of management, Peter Drucker, was firmly opposed to Milton Friedman's ideas of economy and business. Friedman argued that, "a business has a sole responsibility: economic performance." In numerous publications, however, Drucker stated that, "the purpose of a business is to create and serve customers." Money, he would add later, is a necessity.

As anyone intuitively knows, a company needs money in order to grow; and, in order to get money, a company has to be profitable. Yet, money cannot and should not be the *purpose* of a business; this is true even when a business's products and services are so technical that they are by and large overlooked by the everyday consumer. I am referring to industrial products and services. On the contrary, the more hidden these products, ingredients, and components, the greater their impact and responsibility to other industries, businesses, and people. From vacuum tubes to transistors, changes in technology have had wide-reaching impacts on the way hundreds of companies do business, leading to improvements in thousands of products and bettering the lives of millions of people.

Even small or incremental improvements to an industrial product or service can have huge effects on its end user applications. Because of this, I firmly believe that the *purpose* of a company should be strictly related to world progress.

Yet, starting at the end of the twentieth century and continuing on into the twenty-first century, business academies have completely standardized their business doctrine. In today's world, either implicitly or explicitly, teaching business strategy is about teaching ways to "make more money." Some of us believe that this is not a legitimate objective for a business strategy. For us, it is as inappropriate as a Field Marshal who says their sole strategy is to "gain ground."

Business literature is filled with ideas about how to benefit short-term stockholders, which is the type of person the Stock Exchange is teeming with. Too much focus is put on the word *profit*. There are far too many ideas and concepts about *profit-seeking*.

Greed—an uncontrollable desire about which Gordon Gekko[1] said, "it's good; it's necessary and it works"—has done more than simply generate some of the worst financial crises in the history of business. On a day-to-day basis, the anxiety to increase revenue destroys the creative drive to develop a better product, it stifles potential, or it simply leaves a product by the wayside; meanwhile, greed and competitiveness are what ultimately become the markers of a profitable "business model." Put simply, passion for money and passion for technological creation do not go hand in hand in the typical business environment. In today's world, it would seem as if a company's value or its reputation stems from its level of sales or from its profitability, rather than from the objective or demonstrable good that its products provide.

The academe of business has even started to "evangelize" its hopeful audience with case studies of companies that use corporate ingenuity to increase their bottom-line, never mind that in many instances this involves introducing a mediocre product into the world. This ingenuity has been turned into a business model, and its various mechanisms have been singled out and named by its authors: to wit, "built-in obsolescence," "customer lock-in," "network lock-in," "customer recruitment and retention," etc. These ideas are flawed in two ways: they underestimate the customer's intelligence and they do so from the comfort of the office.

For the most part, the conceptual tools that are taught and presented in MBA programs are founded on these ideas and objectives. For decades, academic courses on strategy, marketing, finance, and operations have attempted to systematize ways of getting customers to "fall" into traps—traps set by cunning and predatory businesspeople who find it unnecessary to immerse themselves in the inconveniences of fieldwork. Their business courses have taught them how to use a variety of key decision-making techniques, techniques that are employed from the upper floors of a corporate building. Young people who graduate from these academic programs arrive at their companies with a more theoretical outlook that shows little, if any, empathy: they superimpose a "business model" onto the realities and complexities of the field. The hundreds of case studies these students have been presented with over the course of their academic programs drive them to make fate-altering decisions for their company with very little effort. What they ignore is that these case studies obscure a story that is far less glamorous and synthesized: that is, that

[1] Businessman and the main character featured in the films *Wall Street* (1987) and *Wall Street: Money Never Sleeps* (2010); both films were produced and directed by Oliver Stone.

these businesses have arrived at a successful business model after years of trial and error. What academic case studies don't show are the numerous instances of companies that failed, despite having followed the exact same protocols.

Likewise, marketing has also fallen prey to this complacent and abstract view. Marketing is discussed as if it were an "office-game," one characterized by unilateral methods in which the customer is seen more as a victim rather than as a participant. The most precarious form of market research (and thus the most commonplace) has companies using segmentation programs and the "Four Ps" to try to get customers to give conditioned responses, much the same as in Dr. Pavlov's clever experiment.

Fortunately, sociological approaches don't work for getting an industrial customer to purchase a product/service. An industrial customer is a *colleague*. The customer's personnel may be just as knowledgeable about engineering, just as executive, and just as much of a leader as the suppliers. Dealing with a colleague requires field experience, scientific preparedness, respect, iteration, as well as a certain degree of humility. Industrial suppliers should think of marketing as a science, one that is both conceptual and technical. Marketing creates a mutual understanding between supplier and customer and, furthermore, it allows this understanding to be articulated within the company. This understanding allows an organization to institute important changes (in areas such as investments, engineering, infrastructure, etc.), which also let a company provide demonstrably better offers. In all likelihood, this process accounts for the greatest difference between consumer marketing and industrial marketing. Consumer marketing frequently uses elements of social science to make an offering appealing to customers' psychological phenomena.

While inter-organizational relationships between industrial companies are not free from psychological phenomena, they are nonetheless far more scientific in nature. In fact, they are *increasingly* scientific. This represents a growing trend, one overlooked by company strategists: that is, products and services are becoming increasingly complex and sophisticated. In the past, it would have been sufficient to design and manufacture products solely using metallurgical knowledge; today, designing and manufacturing have to incorporate other sciences, such as electronics, chemistry, magnetism, and data processing, to name a few. As such, it's inconceivable for an industrial marketer not to understand their own products. Perhaps industrial marketing should actually be called engineering marketing. Fully grasping the problems and needs of a clientele, as well as introducing new products, requires scientific and linguistic competencies.

Modern-day executives shouldn't forget that flimsy academia will try to eschew what it does not understand and will, in turn, only promote paradigms of what it does understand. Unfortunately, what academia doesn't grasp might turn out to be an essential ingredient for a business's success. Some of the ingredients that are not covered under social sciences include product engineering, the assorted functionalities that a technical product has for different users, or the various *types* of attributes that a customer looks for in a properly designed product.

The Science of a Product and the Precision of Language

Throughout the twentieth century, one of marketing's greatest flaws was its lack of linguistic precision. Or, to be fair, we should say that language was used carefully for *branding* different marketing concepts, but very little attention was paid to how managers interpreted those concepts over time.

Take, for instance, the word "value." For decades, the word "value" has been used within academia and business literature, as well as by consultants and seminar speakers in every field of business. Perhaps when it first appeared it was a precise term whose sole meaning was immediate and universally understood by all. Today, however, the word "value" is frequently used by those who either don't know or don't care to specify what it means. Given how widely its meaning varies and how often it is subjected to simplistic interpretations, it is not even useful as a metaphor or generalization. What exactly does it mean when someone proposes creating a "value-based strategy" for a customer? What tangible and demonstrable benefits can a customer expect to receive from that sort of statement? Does it provide a good foundation for a research and development department to design technical specifications?

In other contexts, the word "value" is used to refer to benefits accrued by the company itself. When management says that "executives are here in order to add value to the company," it's plausible that what they're referring to is how to increase the company's selling price. In this context, is the word "value" just a euphemism so as to avoid using the word "money"?

In the present volume, we will replace the word "value" with the term "benefits to customers." Throughout these chapters, it will become clear that this benefit has an economic aspect to it and that, furthermore, the economic benefit that an industrial customer receives is an excellent indicator of their purchase intention. Perhaps the word "benefit" is no more precise than the word "value" once was when it was first used by modern-day managers; however, in today's world, the word "benefit" is subject to fewer interpretations. At some point, when the word "benefit" becomes confusing, nebulous, or euphemistic, it will be necessary to search for a new term that provides even greater precision.

Another term that is commonly misused in a business-to-business context is "customer loyalty", which has come to mean unconditional customer loyalty. It is incorrect to think of "loyalty" as an irreversible exchange, one that guarantees a steady and indefinite flow of money from loyal customers. In fact, it can be funny to listen to people who have such an alluring notion of loyalty: they think that eventually, they'll be able to *convert* a customer. It's not just that this idea is bad—which, for the most part, it is—but experienced executives will often insist on taking this leap of faith. In an industrial context at least, marketing strategists should just assume that there's no such thing as customer loyalty. A customer company will continue to purchase from a supplier until a supplier makes a decision that makes them stop. Hence, there was never any loyalty. Or at least, there wasn't the kind of loyalty that inspired Shakespeare to write Sonnet 116. Even if customer loyalty were possible, it would be better for an executive at an industrial company to assume that it wasn't. It's troubling to realize that what really drives suppliers is finding ways to ensure sales over time. If it were possible to ensure industrial customers' loyalty, suppliers might settle on merely providing mediocre, arrogant, and monopolistic offers. In the real world, however, an industrial strategist strives day by day to retain their company's customers. Technical progress is by and large the result of customers' disloyalty.

Another term that industrial products and services suppliers should think twice about is "differentiation." It was very insightful of James Hlavacek to point out that differentiation is an ambiguous goal for an industrial company to have. Industrial customers don't purchase a technical product because it's "different." Conversely, this isn't the case in consumer markets, where customers are interested in products that are distinctive. An industrial customer buys a product or service because it's "better or more apt." The product or service must be functional and technically suitable. Perhaps the word "differentiation" should be exchanged for the word "adaptation." Naturally, differentiation is the result of an industrial product or service being the most proficient of its kind; this is similar to Darwin and Wallace's theory, in which a new species is different because its ancestors underwent changes in order to adapt to their environment. Once again, the word "adaptation" seems more precise and operational than the word "differentiation."

The word "innovation" has also joined the burgeoning world of imprecise language. Today, it's nearly impossible to find a company that doesn't refer to itself as "innovative." For now, there are no studies that show just how many companies really think this about themselves; using the word has become a "me-too" type situation. In second and third world countries, it's very common to find businessmen and women who claim to be innovative solely because they buy new machinery for production. Others tout themselves as "innovative" because they import or assemble products designed in more developed countries. Even within the world of academia, there is no clear consensus about what "innovative" means. For those who are most knowledgeable on this subject, there are essentially three types of innovation: that is, a new product, an improved product, and changes to administrative/operational processes. Classifying innovation in this way is helpful to companies; it allows them to be more conscious about how they innovate or how they might innovate later on. Nonetheless, given that the word "innovation" is subject to varied interpretations, this volume will avoid its use. Instead, it will simply be replaced by the term "new product development." The following chapters will discuss the scope of this development within industrial companies; it will discuss the creation of radically new products as well as incremental improvements to preexisting ones.

The redefinitions outlined above aren't something that this author has done on a whim. Engineering marketing deserves greater language precision so that it will not fall prey to spur-of-the-moment interpretations. It's right to think about how company executives and directors interpret academic concepts; this is because they make and implement decisions based on these interpretations. It is academia, consultants, and business literature that are all responsible for the surplus of definitions that exist for the above terms. Academia shouldn't throw terms around as if it were releasing a flock of white doves into the open air. The wide range of interpretations for words is because each person's mental processes are different. For some executives, the meaning of a word is clearly visible in the word itself (e.g., "to segment" means "to partition"); others, however, have been conditioned by the business culture they live in (e.g., "customer behavior" is defined as "customer purchasing behavior").

"We Were Infected by a Commodity"

It's not wrong to differ somewhat from Ted Levitt when he says, "commodities only exist in the minds of the inept."

Commodities do exist, and they are *conceived of* by the inept. To grasp this idea, one should consider the birth of a new product: why does the company that invented this new product allow it to mature into a commodity? Here, we have to be especially careful about what we say. A good product that is imitated extensively naturally reaches its maturity as a commodity. Hence, the question should be: why do companies that create a new product allow for its current design to mature into a commodity?

The following chapters are based on the premise that managerial behavior is directly responsible for the emergence of a commodity. Or, perhaps better said, a commodity is the direct result of managerial oversight. This can also be understood as: in order for commodities to exist, there must first be minds that think like commodities. After a commodity has infected a company or an industry, something even worse begins to take shape: Commodity Culture. Commodity Culture is a generalized infection that affects the business organization as a whole. In this case, exploratory market research is pushed aside and more resources are devoted to advertising, sales, and production; meanwhile, the company gets fixated on large-volume customers, the research and development department is forced to close due to costs, and members from the board of directors show up each month to review the balance sheet and go over sales figures. Additionally, this infection also sows fear and uncertainty within the organization.

Of course, there are commodities and there are commodities. There are some commodities whose physical makeup is immutable (PTC—*periodic table commodities, see* Chap. 3) or commodities that are more chemically complex and are therefore changeable (CCC—*chemically complex commodity*). Examples of the former include lithium, copper, iron, tin, etc. Examples of the latter include petroleum, cellulose, as well as a vast array of chemical compounds. A lot has been said and written about the difficulties of decommodifying these products. With regard to either of these cases, we will be discussing some of the ways that a company can "cure itself" of true commoditization: that is, the commoditization of a product.

This issue will be discussed at several points throughout this book; specifically, what may have seemed like a good idea in the beginning of times (decommoditizing a commodity by providing a more multifarious offer, e.g., services) has ultimately sent a bad message to company executives: a physical product can be put aside in favor of creating more supplementary services. These services include improvements to logistics, communications, financing, etc. and they are by and large much simpler to implement than a physical improvement to a product. And, of course, customers will undoubtedly take their business to a commodity supplier that offers more services while still maintaining *competitive price*s. Yet, there is an almost mathematical and indisputable truism: regardless of whatever peripheral services there may be, so long as a physical product remains the same, then the benefits of using it remain the same. This inconvenient truth is compounded by another troubling possibility: if it's fairly easy for a supplier to invent peripheral services for their commodity, then it will be just as easy for their quick-witted competitors to do so as well.

The rule of thumb of this book is this: so long as the benefits of a product have been *conceptually* understood, then the possibility of making tangible improvements to a product should never be disregarded. This is true no matter what. After all, the product is what lives on long after the sales transaction and any service benefits have faded into the past. The product is the *raison d'être* for the relationship between customer and supplier; and, in the long run, the benefits of using a product are what interest a customer, or the customer's customer, or the customer's customer's customer, etc. In an industrial context, the product is king! Long live the product!

Customer Behavior or Customer Purchasing Behavior?

All companies have to make sales in order to live, survive, grow, or fulfill their true potential. Each case is different. However, when a company's goal is essentially to "make money," then "achieving sales" becomes an urgent goal. Sales are vital, but they shouldn't be considered essential (the essence).

Like it or not, in the business world critical issues are not necessarily the most important ones. In fact, as the cliché states, obsessing over critical issues can mean setting important ones aside. Yet, what few managers realize is that disregarding important elements exacerbates critical ones, and from here, this vexing cycle of incompetence only gets worse. The company either goes under or gets bailed out at a very high price. Sales are critical. And, as a result, customer purchasing behavior is both *critical* and pressing. Product functionality is *important* and so, understandably, *user behavior* is important as well. As we'll see later on, functionality is essentially the product of a product; functionality is the reason why a product is used and, it follows, why it's bought. Unfortunately, a lot of industrial company directors don't understand this simple logic; this is because in a varied and sometimes prosaic world, customers tend to be far away, dispersed, or simply unknown.

From an intellectual or operational perspective, the higher-ups at a majority of industrial companies spend their time and energies trying to understand their immediate customers' purchasing habits. This is true even when their immediate customer is also a user. Any other type of phenomenon (for instance, product use) is considered too abstract, too long term, and calls for information that the sales force doesn't know and can't find out. There just isn't time. The sales force has time to research information or data that might threaten or improve sales: seasonal variation in sales, sales logistics, money earned from sales, customer complaints, competitor behavior, etc. Similar to T. Levitt's description of a marketing myopia,[2] it's also possible to talk about a sales myopia. One in which the director of an industrial company can only see purchase orders and paid invoices. In so doing, they cultivate one of the key ingredients for a perfect storm: they mistake customer behavior with customer purchasing behavior.

For someone standing safely at a look-out point, it would seem as if the other ingredients for a perfect storm were all interdependent variables in the same algorithm: that is, short-term thinking, commoditization, sales culture, and a lack of knowledge about the user.

Too Many Names for Marketing

Not surprisingly, confusing customer behavior with customer purchasing behavior has discredited marketing, so that now many people see it as a social science purely dedicated to creating manipulative and cunning advertising. In the Garden of Eden, Eve could well have fallen victim to a snake that studied marketing.

The idea that marketing is essentially a promotional tool is the result of an organization's "sales culture" and the sales culture at academies where these executives studied. This type of marketing has many faces, some of which go in and out of vogue: direct marketing, relationship marketing, content marketing, digital marketing, guerrilla marketing, viral marketing, internal marketing, etc. Now well into the twenty-first century, some authors list over 130 terms for marketing. At the risk of sounding too conservative, this author maintains that there are only two types of customers: natural persons (and their plants and animals) and organizations made up of people. Here, this book proposes combining all of the various terms in order to arrive at two forms of marketing: marketing for mass consumption and industrial marketing (or engineering marketing). The reader is asked to distance themselves from what they've read and studied about different types of marketing and to really reflect on what each type of marketing stands for: does it have a promotional objective? Is it primarily for communication purposes? Is it inspired by Pavlovian theory of customers' conditioned responses?

Take for instance the type of marketing known as "relationship marketing." Who can properly define relationship marketing without mentioning things that are really the responsibility of a proactive sales force? Furthermore, all of this is based on the premise that people who design and implement relationship marketing have win-win intentions. Once again, when academia fails to provide a precise definition for a term, management steps in with its own meaning. In today's world, it's easy to find company directors who believe that relationship marketing is just a mix of activities

[2] Marketing Myopia. Theodore Levitt. HBR September-October, 1975.

that are meant to "smooth out the relationship" with their most important customers. In this context, very few people would draw a line between relationship marketing, a loyalty program, company dinners, rounds of golf, and corporate gifts. It's easy to see how appealing relationship marketing is for company directors and executives who think that social activities will increase their sales! For them, sales executives are hired precisely because they are extroverted, charming, and good-natured people.

When industrial marketing is properly understood, it becomes clear that promotional techniques are just the last in a long line of activities, all of which are much more complex and fundamental. This type of marketing understands that success largely hinges on iterating, understanding, and translating a customer's needs into technical language so that they can be articulated in an intelligent way within a company. Companies with this mindset assume the responsibility (and everything else this implies) to design and develop an adequate product/service. If this initial phase is done well, then it's industrial marketing's turn to take the stage; industrial marketing allows a new product to be properly understood by customers that might chose to adopt it. Meanwhile, the sales force carries out iterative activities with customers to determine which product is right for each case. Lastly, industrial marketing is responsible for the performance promise and consistently studies how the product is being used by the customer. When understood correctly, industrial marketing is about caring for the most powerful long-term relationship that exists with a customer: the relationship between a customer and the benefits of the product.

The End User Is the Real Customer!

Whether it's a company or a household, the end user is responsible for setting the entire industrial and logistical chain in motion. When the end user demonstrates a preference for a particular product or service, it's because the benefits they provide are the ones most suited to that user's needs. Benefits consist of functionalities and attributes. These functionalities and attributes are made possible due to engineering, including the engineering that goes into developing ingredient and component products at other industrial companies.

The end user, however, is more than just derived demand or a pull strategy for components and ingredients. Derived demand or pull strategy is for people who only think of marketing in terms of promotional marketing.

The end user should be seen as a source of information and insights, one that facilitates functional and engineering improvements to a finished product. This lets industrial companies know what they need to do, whether it's improving a product or developing a new product. This is also true for those who wish to engage in disruptive innovation.[3] To put it another way, once a company has developed a product

[3] The Innovator's Dilemma. Clayton M Christensen. Harper Business; Reprint edition. October 4, 2011.

that benefits end users (and cost permitting), there should be nothing that keeps these customers from adopting it. Intermediaries (e.g., distributors, constructing companies, contractors, integrators) can be powerful, but the end user is even more powerful.

Intermediaries will not necessarily know very much about the end user. They are not a good source of information for learning about what goes on between an end user and an integrated product. If some of these intermediaries have been infected by commodity culture, they simply will not be interested in finding out what goes on beyond their company's front door. In other cases, however, a manufacturer can team up with a more progressive intermediary (e.g., an integrator) to learn about the final customer. Or it can be done with a supplier. Or it can be done by all three.

Naturally, some modifications to a product's ingredients and components might benefit an intermediary without actually benefiting the end user. These benefits could, for instance, have a positive effect on an intermediary's productivity, or they might facilitate its stock, transport, or integration operations. These are all good ideas and they could give a manufacturer a competitive edge… but only so long as their competitors ignore the end user. In the long run, a company that improves its product solely for the benefit of an intermediary cannot compete with a company whose product improvements benefit the end user. Ideally, however, a manufacturer should concern itself with all the aspects of a product: those that benefit the intermediary as well as those that benefit the end user. What benefits one may not benefit the other, and the present volume will make a first attempt at classifying these elements so that they can be more easily understood.

The Organization of an Industrial Company: Culture, Change, and Fear

The present volume contains an array of concepts, tools, and techniques for industrial companies that are looking to modernize their marketing. But it also contains a forceful call for cultural change within an organization. All of the concepts that are presented in this book are based on the assumption that a business or company exists for one particular reason: to serve customers. Profitability is understood as an outcome, not as a purpose. For those that disagree, many of the concepts and tools presented in this book will make them uneasy.

Industrial companies must develop an awareness of themselves. These days, they are afflicted by a paradoxical malaise: these companies are self-absorbed but they are not self-aware.

The list of distractions keeps growing: the obsession with reaching a sales quota and the enormous amount of "how-to-do" tools are two things that plague talented executives on a day-to-day basis. Company's "what-to-do" have gotten buried under other "impostors," such as growth goals, "top-line goals," and "bottom-line goals." Furthermore, these are all goals that are common to any company within the same industry. Thus, their "what-to-do" is just as faulty as that of their competitors.

Of course, profitability ratios are real and they're necessary, but they shouldn't be the starting-off point for defining what a company needs to do. Stockholders' profit objectives are no longer inspiring. Perhaps they never were. The following dialogue should never take place at any progressive company or business unit:

General manager: Stockholders need a X% ROI this year. I need each and every one of you to bring me an activity proposal and a budget that lets us meet this goal.

Executives: That goal is way too high for the state of the current economy. Our markets aren't growing.

General manager: Stockholders don't care about that. You'll figure out what you need to do. Sell more, lower the costs, or increase the prices! Or do all three!

There are two problems here. On the one hand, there's a time-based mentality. Companies that organize their *objectives* quarterly, biannually, or annually are the same companies that lower their defenses and are at risk of being infected by commodity culture. Management control might be able to work on this schedule, but a company's goals shouldn't have to.

Secondly, the above dialogue shows just how few variables these types of companies work with: sales, prices, and costs. For pundits at these companies, this is all they're allowed to think about; thus they end up asking themselves, "What am I doing here? Shouldn't there be a better place for me to put my talents to work? How can I take the leap?"

In this author's experience, companies whose projects have a beneficial impact on the world are naturally able to motivate their employees. The ongoing development of interesting products has a huge effect on employee productivity and creativity. Conversely, at companies that get stuck doing the same thing over and over again, where the only novelties are customer complaints or breakthroughs made by competitors, leaders have a hard time motivating their personnel and overcoming personnel's resistance to new performance goals. It's these type of companies that make use of motivational, leadership, and "soft" skills workshops. They are plagued by fear and/or resignation.

There is both good news and bad news for people who work at a company infected by commodification. The good news is more good than the bad news is bad. Nevertheless, it's important to realize that the bad news is still quite bad.

The good news is that there is a solution for this situation. This volume hopes to contribute to that solution. The bad news is that it takes time and, possibly, changes to the head of the company. That is, either change what's in the head or change the head itself.

Hamburg, Germany Claudio A. Saavedra

Contents

1 The Fight Against Corporate Autism in Industrial Companies

Someone who's absorbed in administrative duties and day-to-day events won't be able to comprehend the huge and hidden changes that affect the marketplace. The human mind seems to have evolved so that people can learn from repetitive events that occur throughout the year and make plans for the future. Immediate dangers and repetitive events have prompted people to live in groups, and to organize and protect one another. This helps explain people's sense of belonging, and subsequently, language and culture.

The invention of agriculture further precipitated these phenomena. With the domestication of plants and animals came population density, division of labor, centralized government, and the idea of property. For the first time, human beings began to bury their dead in one place.

The first small settlements began to grow larger and before long, word spread about the height of their towers and the wealth of their inhabitants. These stories turned into fables. In order for these cities to protect themselves from their wild surroundings and control who came in and out, they began to construct magnificent walls. This is when society quickly started to became more complex. People began to depend on one another, and life within the city walls began to seem self-contained. Social castes started to distance themselves from each other and they erected monumental temples in honor of their deities. The first organizations began to emerge and with them, government and politics. Children were told stories about strange things that went on just beyond the city walls and adults entertained themselves with gossip about their neighbors. From day to day, a routine emerged. Then it was month to month. Then year to year.

Yet, there was an underlying danger, one that was even greater for those that felt safest behind the walls of their fortress. Outsiders coveted their apparent wealth, and the most densely populated cities began to suffer from some of the worst winters, plagues and droughts.

The fact of the matter is that these calamities were only detected once they were already imminent. Absorbed as they were in their struggle to stay alive or prosper (whichever the case may be), these magnificent and sometimes beautiful cities were

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incapable of understanding what lay outside of their city walls. Once a crisis began, a city's organizational deficiencies only exacerbated the onslaught of plagues, hunger and enemies.

Despite their use of carrier pigeons, ambassadors and spies, these walled cities were ignorant of their environment.

Now, thousands of years later, a different type of administratively complex and self-absorbed human community is undergoing a similar hardship: a vast amount of modern-day business organizations do not understand their environment. In all likelihood, many of them don't even know how to understand their environment. Companies that sell consumer products have the advantage of being familiar with their customers and their customers' habits; yet, this doesn't necessarily mean that these companies understand what has, does and will happen. The situation is even worse for industrial companies who find themselves 'hidden' at the back of a logistics chain of integration and distribution.

A lot of industrial companies spend their time dealing with whatever production and sales issues come up. They're pulled along by the macroeconomic tide, completely dependent on favorable demand conditions.

Perhaps one of the main reasons that helps explain why industrial companies are unfamiliar with their environment, don't ask the right questions, or don't even realize that they should ask questions is this: *officism*. Officism is a relatively new phenomenon; yet, it's so familiar and deep-rooted that a lot of industrial company executives falsely believe that they're working on key business issues when what they're really doing is spending time in the office attending to administrative tasks.

The greater the size and administrative complexity of a company, the greater its risk of succumbing to officism. No doubt, the office is an attractive place for an executive: it's comfortable and it builds habits. It's a reference point outside the home, it's where executives go to show that they're 'at work', it's where they feel useful and get things done. And, if there's not much to do, they'll invent things to do unconsciously.

What's more, the office allows for coordination, intellectual synergy, personal communication, and it provides a collection of different tools that help make tasks more productive.

Nonetheless, a customer's experience of a product takes place outside of a supplier's office. If a company's key decision-makers spend the majority of their time in the office, then they'll have to rely on third-person accounts, rumors, publications and, well, theories from other office workers for perspective on their company's environment, customers, market, and competitors.

Make no mistake about the above statements. No doubt, important intellectual iterations take place in the office, some of which may affect the future of a company, or even an entire industry. However, excessive officism means that a company is neglecting certain responsibilities that impact upon the benefits customers need. As a sickness, officism means wasted time.

In order to understand an environment, companies first need to look for questions, not answers.

A Company's 'How-to-Do' and 'What-to-Do'

If we take a large sample of industrial companies and look at what employees spend their time on, we'd find that employees spend the majority of their time on operational and administrative improvement projects. These types of activities can be regarded as 'how-to-do' activities. Some contemporary examples of these 'how-to-do' tools include: Balanced Score Card, ISO9011, ABC costing, Outsourcing, TQM, EVA, Six-Sigma, competency-based management, activity-system maps, the use of ERP software, systematic canvassing for innovation purposes, etc.

Many of these tools are compelling and well-intentioned. However, if a company embarks on one of these projects without a clear sense of direction—without a 'what-to-do'—it ends up thinking "project-wise". Thus, the organization is limited to self-perfecting each of its various mechanisms in isolation, unaware of its own surroundings. This is what this author refers to as 'corporate autism'.

Generally, the market refers to 'how-to-do' practices as 'best practices'. And, just as its name suggests, many of these practices have positive effects on productivity, costs, quality, coordination, and company profitability. Companies can make these improvements even when they're unclear or misguided about 'what-to-do'. And this is precisely the problem. Companies that get fully absorbed by these improvements end up going "offer-obsolete"; they go under and take their impeccable administrative mechanisms with them. Other companies survive, unaware of the opportunities that lie just beyond their front door. For the most part, companies that aren't sure about the direction they're headed are lucky enough to have products with a prolonged period of maturation. These companies survive and are profitable because they offer their customers installed capacity and credit lines.

Unfortunately, 'what-to-do' isn't something that companies can buy. A sense of direction comes from consistently observing and analyzing one's environment: its past, its present and, hence, its future. A company's 'what-to-do' depends on their products and customers; 'what-to-do' shouldn't be confused with the type of generic interests that are common to any company. Sales growth objectives, profitability goals, or a vague declaration about leadership—none of these constitute a functional definition of 'what-to-do'.

A Company's Vision and Industrial Marketing

Tetra-Pak is a Swedish food processing and packaging company. They're vision statement reads as follows:

> "We commit to making food safe and available, everywhere".

This vision statement is remarkable for five reasons:

1. It's short. In contrast to the long and tedious vision statements that can be found in a lot of companies' entrance halls, Tetra-Pak's vision statement is brief and can be easily memorized by any company member.

2. It's operational. Perhaps this statement's greatest virtue is that it relays a lot of information in just a few words. This information says a great deal about what the company does and doesn't do, so much so that it's able to structure discussions on possible new business ventures.
3. It's challenging. Tetra-Pak has done more than any other company to make food safe and available in places that were previously thought to be inaccessible. But the challenge is 'everywhere'. There's still a lot to be done, and this fact alone is part of what energizes the company and inspires it to work.
4. It's based around an 'other'. This might be this vision statement's most distinguishing characteristic and the one that best encompasses a modern philosophical approach to industrial marketing. This statement is not about the company's goals for itself, rather, it is based around benefiting others. Conversely, the vast majority of vision statements are predicated on turning a company into a 'leader' (possibly one of the most frequently used clichés in the history of business) or into a 'reference company' for its customers and competitors.
5. It's cultural. A vision statement like the above—so long as it is consistently reiterated and talked about—is an important element in creating an identity. When a vision statement is authentic enough to create and support culture within a company, it ultimately brings the members of an organization together.

While other companies focus on 'growth' or on achieving $XYZ sales, Tetra-Pak's 'what-to-do' is about making more food safe, or bringing food to parts of the world where it would otherwise go bad early on. Yet, Tetra-Pak's products and services are by no means cheap.

An autistic organization doesn't know that it's autistic and is hardly self-aware. Many of them stagger along the path towards commoditization and they blame customers for their own internal organizational suffering. A lot of executives think that "they (the customers) are always comparing them to their competitors, prefer to purchase from other suppliers, push for lower prices, complain at any hour of the day and for any number of petty reasons." For an autistic organization, it's natural to refer to customers as 'accounts'. Customers that buy the most are considered key accounts and companies have to get their 'loyalty' at all costs. (N.A.: It's hard to pinpoint the origin of the term 'account'; however, it wouldn't be surprising to learn that it stems from the world of banking. Whoever coined the term might have thought that with a large number of customers, "they deserve to be treated like a statistic.")

Tetra-Pak's vision statement is a lesson about marketing's responsibility and impact within an organization. After all, if a vision statement explicitly or implicitly references the customer, it's because marketing was there to help write it. Marketing should be seen as a type of knowledge, not as a department. Marketing should be part of the company directors' and employees' *weltangschauung*. When it is properly understood, marketing works as an antibiotic against corporate autism. It is essential to a company's consciousness.

Market Paradigms

No one should consider themselves a good marketing strategist unless they've at least tried to grasp, analyze, comprehend and talk to their the organization about market changes that could affect their customers, or their customer's customers. The essence of good marketing is exploration, understanding the phenomena that affect markets and customers, and articulating these things within an organization so that an organization can adequately respond to these changes.

In order to understand what goes on outside of a company, a marketing strategist will inevitably need conceptual tools that help them understand the complexities of the world around them. Crucially, a marketing strategist should not only be familiar with, but also master and use the concept of 'paradigm'. Why? Because paradigms are what ultimately drive the adoption of new products and services.

An industrial marketing strategist should do whatever possible to pinpoint paradigm shifts in the market; they should ask themselves why these shifts occur and why many of them go unnoticed. Not asking the right questions may mean that a company doesn't find out about a paradigm until it's too late. A lot of business organizations ask themselves: what's the most likely thing to occur? However, their first question should really be: which past events will shape the future?

Paradigms are a human phenomenon. They are mental models (archetypes) used to interpret the phenomena of the world. For example, over the past few decades, business schools have taught students under the paradigm of teamwork: a good executive is one that knows how to work in a team. Thus, students create a mental model for themselves, a guide as to how work should be conceived, executed and taught. Very few people question the fact that this is a paradigm and that, as such, it's appropriate for certain circumstances. Other situations require genius: a man or woman with a superior idea. No matter how much time they had, a team would probably never produce that kind of idea.

Coherent paradigms mean coherent behavior.

Some examples of business paradigms include: teamwork, customer orientation, company growth, corporate structuring models, soft-skills, etc. Some examples of scientific paradigms include: Newtonian physics and the theory of relativity, etc.

What's the relationship between a more reflective and thorough type of marketing and the concept of a 'paradigm'?

Paradigms, or paradigm shifts, are what account for customers preferring one industrial technology over another. Paradigms can be contagious and many of them are incredibly enticing (however, they do not necessarily lead to human progress). They can be taught or imitated (even if they're not recognized as paradigms). Some people suggest that when a paradigm is in vogue, it's good. When it's not, it's bad.

Whatever the case may be, the majority of paradigms share one thing in common: they are largely unnoticed. Which is to say, the vast majority of people's notions about reality are just interpretations that they believe to be true.

Of course, this doesn't mean that the events themselves are being overlooked, but the fact that a given event stems from a particular paradigm frequently is. Just look what happens if ask the reader: what are your personal paradigms? Many readers would have to spend a long time reflecting before he/she could arrive at a clear understanding of what their paradigms are.

As a result, when people adopt a new paradigm without realizing that it's a paradigm, they can easily assume that it's some 'new and eternal truth'.

An industrial marketer should also ask themselves (and try to answer): how is a paradigm shift produced? To answer this question, we can use an analogy about a heap of sand. A person can make a pile of sand grain by grain. Little by little, the tension will increase until, at some point, adding the next grain will cause part of the structure to collapse. Paradigm shifts are similar. An 'invisible tension' builds up within a previous paradigm and it eventually emerges as a crisis. Obviously, crises are far more difficult to ignore, and they can actually be an incredibly useful tool for an industrial marketing strategist. A huge crisis can give way to a huge paradigm shift; likewise, a small crisis can give way to a small paradigm shift.

The French Revolution was a clearly visible crisis. It lead to impressive paradigm changes (decolonization, unprecedented individual liberties, models of social equality, etc.), so much so, that they are still felt today. Indeed, the true extent of its effects are still unknown. When one industrial technology substitutes another this is also the result of a crisis. It could be an immediate crisis, such as an increase in the price of raw materials that makes certain technologies unfeasible. Or, it could be the result of an indirect crisis, such as changes in the downstream industrial chain that affect how products are used or consumed. Recent paradigm shifts in cell phones—the switch from push-button technology to touch-screens—has had dramatic implications for several industrial suppliers.

An industrial marketing strategist should be aware that customers develop mental attachments to paradigms. Because this type of mental processing is unconscious, many people assume that what's new as a paradigm is what's true; they either ignore or deny that eventually, this truth could end up going obsolete. For a lot of people, paradigms function as personal or professional tools for success. Just thinking about the possibility of one's beliefs going obsolete is hard. Yet, market forces (the kind that simmer just below the surface) can be nearly impossible to navigate. Indeed, it's much easier to promote new paradigms (to add the next grain of sand to the pile, such as in the example described above) than it is to extend the life of a paradigm that is on its way out.

As a result, an industrial marketing strategist should always try to ask and respond to the following questions:

- Which market paradigms currently create demand for our product?
- What paradigm shifts are currently underway that might affect this industry and this company?
- What are my personal business paradigms and are they up-to-date? What are the paradigms of other company members and are those paradigms up-to-date?

The first two questions are there to help an industrial marketing strategist understand their company's surrounding environment (the marketplace). The last two questions concern another of marketing's responsibilities (assuming it's done well):

make sure the organization remains firmly grounded in the reality of the marketplace. Organizational paradigms produce organizational behavior and an organizational culture. One efficient way (or, at least, one of the most efficient ways) of analyzing an organization's paradigms, is to identify and debate the various *assumptions* that influence a company's business decisions.

Business Assumptions

In 1994, Peter Drucker coined a concept that, although it was greatly discussed by academics and practitioners at the time, today seems to have largely been forgotten. Drucker said that every member of an organization "understands their business through a set of assumptions."[1]

Assumptions are thoughts or judgments that are considered true without any sort of verification. In contrast to paradigms—which can be thought of as a 'navigational chart'—assumptions make it possible to arrive at conclusions and make decisions in the heat of the moment. In their day-to-day work, business organizations are brimming with assumptions; assumptions underlie how people think and what they say. Often, assumptions are the 'visible face' of a person's paradigms.

The problem with assumptions is that they can become detached from reality. As such, Drucker caused some controversy when he asked company directors the following question: what are the assumptions you use to understand your business? Fully grasping the essence of this message requires a degree of humility that many modern-day executives don't have. The idea behind this statement is that even the most talented businessperson will feel some degree of self-doubt when it comes to describing the state of the market, or their organization, or even the future of their company or industry.

On the contrary, for most companies, it would seem as if this kind of self-doubt didn't exist. It's disheartening to hear upper managers at different industrial companies say things like:

"*Customers want x, y, z*" (said by a senior executive who hasn't gone to visit a single customer in two years, and for whom its been eight years since they visited a customer in order to *explore customer needs*).

"*We have a reputation for doing things well*" (said by a business owner who doesn't realize that most of his customers think the opposite).

"*There will always be demand for what we provide. The world is headed in that direction*" (said by another business owner who is four steps removed from the end-user, and is ignorant of paradigms and trends affecting the end-user). Companies should always have some degree of doubt. Doubt is what helps professional men and women spring into action and evaluate the real world. This kind of executive disapproves of categorical statements made by members of their organization, especially if these statements concern their surrounding environment. They find these

[1] Management in a Time of Great Change. Peter F. Drucker. HBRP. 1995.

statements to be hollow, arrogant, complacent or negative. This type of executive is rightfully irritated by statements that are really just shots in the dark.

As such, this author holds that: most of the time, it's irresponsible for a company to make categorical statements about its customers and the business environment.

Unfortunately, they are very common. It's as if making categorical statements (without verifying them) were indicative of power and skill. With this in mind, it's amazing to think about how diligent and precise scientists are when they're presenting their ideas or discoveries. Scientific precision is not just mathematical, it's also linguistic. This is true even when discussing an as yet unconfirmed idea; scientists use plenty of words like 'maybe', 'it's possible that', 'it could be that', and frame sentences in the conditional tense. If language were used more correctly, this alone would save any number of businesses from failure.

There can be grave consequences for an organization whose assumptions are out of sync with reality. The most common is for the business to collapse ('collapse' in the sense that it is understood today). There are as many examples of this in the history of business as there have been wars in human history. Rather than cite specific examples, it's better to outline the phenomenon as a whole: each new product potentially means another obsolete product (since the new product is probably replacing a mature one). In the majority of cases, this obsolescence occurs suddenly, unexpectedly and disastrously for suppliers, as well as their stockholders and employees. Organizations that succumb to obsolescence are the kind of organizations that are self-absorbed; they're overcome by corporate autism, and as a result, they have a misguided business theory. Their full attention is focused on their own administrative and productive mechanisms, on achieving (and being rewarded for) short-term goals; an autistic organization does not question its own products, services, market definitions, and business model.

An autistic organization focuses on its internal tasks, on whether or not things are done on time, on the ingenuity of employees who reach their quotas and on the passivity of those that don't. This company may have a general idea about what their customers think of them; however, customers opinions aren't important to them. Or, even if they are important, the company won't do anything about it. Anything that happens outside of the company is governed by fate or luck.

How does business theory relate to an industrial company that sells its products and services to another company?

Globally, there are a significant number of large industrial manufacturers that fit the description of an autistic organization. These companies' business theory (or their lack thereof) usually leads to one of the following statements:

1. "The key to our success is increasing productivity and lowering costs. The customer wants lower prices and that's why they come to us."
2. "We need to protect our industry from untrustworthy competitors, both here and abroad."
3. "Our strength is in our customer orientation. Since our product is a commodity, we've started providing enticing services that help set us apart."

4. “The future belongs to those who know how to build complex, inter-industrial networks (or nodes). This is what we call a sophisticated strategy; it will keep us from being copied by bad competitors.”
5. “What distinguishes us is our financial discipline, our professionalism, and our honesty. Our values have kept us safe through hard times, and it has rewarded us during good times.”
6. “Why do our customers buy from us? Because they know that behind our brand is a multinational network of technical support and financial backing; moreover, customers know that if they have any sort of problem with our product or service, we’ll be able to respond in a way that lives up to their standards.”

At first glance, many of these statements seem honorable. And, in fact, some of them are. The first problem with these statements is that they’re made by people who rarely check to see if they correspond with reality. Quite often, senior executives will resort to cliché or ‘politically academic’ statements when they’re asked such basic questions as: what does your organization excel at? Why do your customers buy from you? What steps have you taken that account for your company’s growth?

Only the more exemplary managers and business owners think about these questions, do their own fastidious research into the reasons behind their company’s successes and failures, and are able to answer them in ways that are clear, distinctive, and lucid.

The second problem is that none of the above statements constitute a fully-developed business theory. A comprehensive business theory requires a realistic understanding of the organization’s environment, how to confront the future, and what talents the organization has that will help it succeed in its environment and in the future.

The third problem is that even if all of the above statements came from a single organization, collectively they do not constitute a compelling business theory. At each stage in history, there have been successful business theories that match up with what the market wants. That is, not only should a business theory be as realistic and comprehensive as possible, but it should also be bold and take risks.

What is it that keeps many industrial manufacturers from forming a realistic, comprehensive and risk-taking business theory? To be fair, manufacturers have to deal with the following phenomena, many of which may be at least partly to blame:

1. Physical and intellectual distance between the manufacturer and end-user.
2. The manufacturer’s physical and intellectual proximity to production plants and logistical and administrative problems.
3. Dependency on expensive technologies and high fixed costs; an obsession with large volume purchase orders.
4. A ‘hope for the best’ culture: let’s cross our fingers and hope that this month’s revenues turn out well.

Corporate autism can be cured.

The best remedy is to develop a good marketing culture.

2 Misinterpreting Customer Orientation

Introduction

One has to face the fact that over the past few decades, academia, business literature and consultants have contributed to a false dichotomy that's used to mentor executives: namely, that customer orientation is good and product orientation is bad.

In practice, very few directors or executives are product oriented. Far more common are executives and directors that are completely consumed by 'how-to-do' tools such as the ones discussed in the previous chapter. For instance, in the majority of MBA programs a business strategy amounts to a compilation of technical and conceptual tools outlined on presentation slides. MBA students should ask their professors if companies have been successful as a result of these business models, or if these business models have been successful as a result of tenacious and experienced companies.

With regards to the above, experienced managers increasingly seem to believe that 'canvassing', 'diagrams', 'positioning maps', 'value drivers', 'corporate matrices', 'scorecards', and so on are fun to discuss and fill out; yet, none of these have any short or long-term impact on a company's customers. The reader shouldn't get the wrong impression. Some of these tools are very inventive and well-intentioned; however, the creators of these tools have neglected how they've been interpreted and used within the world of management.

Indeed, the use of these tools has meant that generations of entrepreneurs, company directors, and executives are disconnected from what customers really need: the solution to a problem or challenge.

The only way to deliver this solution is through a product or service.

Few people seem to remember that the only reason a company exists is because customers buy its products in order to *use them*. In this chapter, the author will discuss how the customer orientation paradigm has been misinterpreted by industrial organizations. Moreover, the victim in this scenario is actually the protagonist: that is, the product and the product's real benefits.

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_2

No one knows for sure when the customer orientation paradigm came into being. In all likelihood, it never appeared, it just always was. What's clear, however, is that following the Second World War, and with the creation of thousands of business schools worldwide, this paradigm became incredibly popular.

Since then, the customer orientation paradigm has been passionately endorsed by opinion leaders, academics, and—from the 1970s onward—by business consultants. It has introduced new terminology: keep close to customers, listen to customers, customer focus, voice of the customer, customer-driven, market-driven, etc. And executives everywhere have raced to gather customer information and share their discoveries with their organization. There are numerous customer orientation models that companies can refer to for this kind of project.

Unfortunately, customer orientation quickly found its antagonist in what academics and consultants refer to as 'product orientation'. According to popular belief, product orientation is considered a mental illness, one that makes a company focus on what it produces or sells. It didn't take long before people started seeing product orientation as a sickness that plagues organizations, keeping them in the dark and underdeveloped. This is the case for many industrial companies.

What's even more unfortunate is how businesspeople and executives have interpreted this duality (customer orientation *versus* product orientation). Trapped in a disheartening commodity culture, when these businesspeople were told that 'product orientation' was misguided, they turned to 'soft' ways of satisfying customers. Many of them neglected their product and thought of their product as an 'indistinguishable commodity'. Today, as a result, it's common to hear comments like:

> Our products are commodities. The only way to ensure a sale at a good price is by offering complementary services.

This way of thinking about an offer is represented in Fig. 2.1.

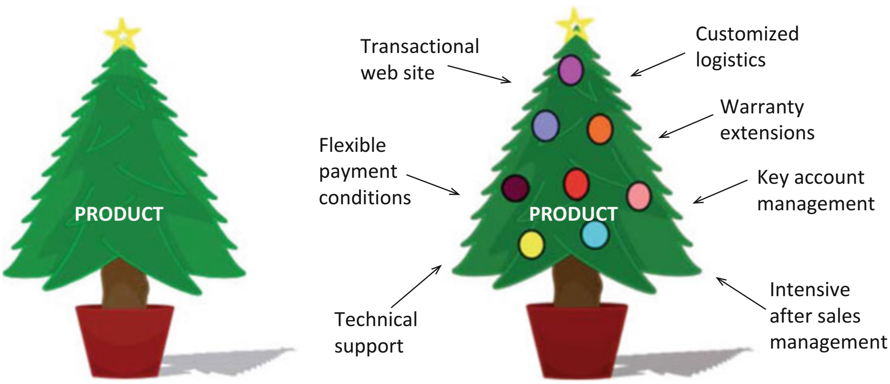

Fig. 2.1 The tree depicted on the left represents the product itself. The tree on the right shows the same product, only now the product is decorated with complementary services. These services, many of which may be necessary for customers, tend to have their greatest impact during customers' purchasing experience

There is a wide range of services that are used to set a product apart and make it 'distinguishable' from other products of its kind. These services will probably be similar to, if not identical, to those offered by competitors. They include:

- Better delivery times
- Improved delivery punctuality
- Special price promotions
- Improved stock and mix management
- Allocation of executives to manage 'key accounts'
- Creation of an online store
- Organized technical support (in case of complaints)
- Invitations to technical seminars
- Merchandising for distributors
- Others

Some of these focus on logistics, others focus on sales or promotion. What's the problem with these initiatives? In the medium and/or long-term, none of these are strategically advantageous for a supply company. That is, the majority of these ideas are meant to assist a customer during the purchasing process.

This chapter proposes that an industrial marketer should figure out which complementary services are required by each customer and think of these services as a *hygienic base* from which to begin benefiting the customer. This conceptual foundation underpins a reality that is generally overlooked by most suppliers: that a customer will own their product over time. Customers will use the product, and, over the years, they'll form an opinion of the supplier or the supplier's technology based on the benefits they receive from the product. In fact, many industrial suppliers have simply forgotten that *a product is bought in order to be used and benefited from.*

When customer orientation is misinterpreted, the first victim is the product itself. It's not an exaggeration to say that in several organizations, the customer orientation paradigm has effectively 'killed the product'. The consequences were immediate. For authors that promote 'customer orientation' as an upper state of mind over 'product orientation', one of the most extensively example used is the automobile Saturn. During the early 1990s, when the Saturn Corporation first began, it seemed promising. Originally, this subsidiary of General Motors chose to offer interesting and good-quality automobiles; moreover, they were backed by a solid and diligent network of distributors. For the first time, their assembly line permitted 'flexible manufacturing', a method of manufacturing that originated in Japan and that Saturn Corporation imitated and improved upon. As the years passed, Saturn kept investing more resources in creating 'friendly and diligent dealerships' as its main "differentiation strategy".

Until here, the story works in favor of the "customer orientation" case. It was in 1999 that, in the words of Jeff Nelson of Curbside Classic, Saturn began "a long and tragic fall into irrelevancy and failure." In simple terms, one could say that this was attributable to a misguided business 'model'. Complementary services were given priority over and above the product's characteristics that customers look for in a good product (the car). By mid 2000, the only thing left of Saturn was an excellent network of distributors. In 2009, the brand closed its doors for good; they left for posterity the added failure of not being able to sell the company.

A further problem with how customer orientation has been taught and understood by industrial companies is this: in their attempts to gain an edge over competitors, executives have become far too creative at inventing 'services' and 'soft' forms of offers. Just look at the following example of a pharmaceutical laboratory that launched a 'customer loyalty program' for customers it considered 'strategic'. Figure 2.2 shows how several new services were launched that were 'standard' for these customers. Transactional clients were not as fortunate; for them, many of these services were either optional or unavailable.

What was the outcome of this so-called customer orientation? That after 2 years, this company was offering practically all of these services to all of their customers. See Fig. 2.3.

If the reader wants to learn more about dramatic examples of customer orientation gone wrong, they should look at industrial manufacturers. In many cases, industrial manufacturers' product (be it a component or an ingredient) travels down a stream of intermediary companies before it arrives at the end-user. A lot of these manufacturers focus on serving their immediate customer (the one who pays the bills) as well as possible. These immediate customers might be a distributor, a contractor, or an integrator.

Driven by good intentions, these industrial manufacturers have asked their immediate customers about their needs, ignoring the importance of learning about the requirements and needs of the most strategic customer of all: the end-user.

	ELEMENTS OF THE OFFER	SEGMENT	
		Transactional customer	Strategic customer
Services			
	Product returns	Standard	Standard
	Technical assistance	Standard	Standard
	Single point of contact	Not offered	Standard
	Future incident forecast	Not offered	Optional
Programs			
	Price promotions	Standard	Standard
	Financial incentive type I	Not offered	Standard
	Executive insights	Not offered	Standard
	Consolidated purchase report	Not offered	Standard
	CRM program	Not offered	Optional
	Corporate consulting	Not offered	Optional
Systems			
	Express order entry system	Standard	Standard
	Key IT supplier assessment	Not offered	Standard
	No stock inventory program	Optional	Optional
	Key IT supplier asset management	Optional	Optional

Fig. 2.2 Example of a complementary service program run by a pharmaceutical laboratory. This design provides basic services to a group of 'transactional' customers; meanwhile, 'strategic' customers receive a wider range of services

ELEMENTS OF THE OFFER		SEGMENT	
		Transactional customer	Strategic customer
Services			
	Product returns	Standard	Standard
	Technical assistance	Standard	Standard
	Single point of contact	Standard	Standard
	Future incident forecast	Standard	Standard
Programs			
	Price promotions	Standard	Standard
	Financial incentive type I	Standard	Standard
	Executive insights	Standard	Standard
	Consolidated purchase report	Standard	Standard
	CRM program	Standard	Standard
	Corporate consulting	Standard	Standard
Systems			
	Express order entry system	Standard	Standard
	Key IT supplier assessment	Standard	Standard
	No stock inventory program	Standard	Standard
	Key IT supplier asset management	Standard	Standard

Fig. 2.3 Two years after the implementation of this complementary service program, it's clear that the offer has been homogenized and transactional customers receive the same services as strategic customers. Competitors have done the same thing and each service program has only made the product more expensive for the end-user

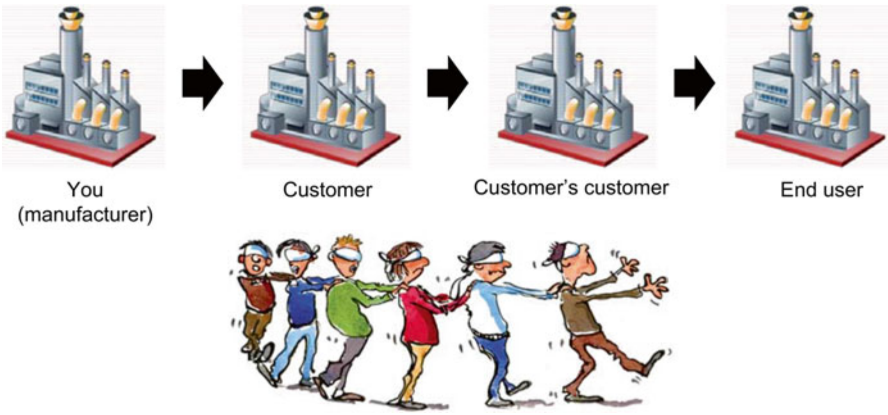

Fig. 2.4 The danger of simply 'listening' to the customer. In industrial markets, the downstream industrial chain is key to creating a reliable business strategy. However, direct customers aren't always the best source of information since they may not know much about their own customers' needs. This continues until arriving at the end-user

This is where a phenomenon that can be named as 'systemic chain blindness' comes into play. In 'systemic chain blindness', a company's business is built around 'listening' to customers that are ignorant of their own customers, and on and on down the industrial chain. See Fig. 2.4.

Listening to customers about their needs can be dangerous if companies don't use appropriate concepts and an appropriate method. As a general rule, customers answer well-meaning questions with an eye to their own 'immediate' concerns. Experience shows that in an industrial context, immediate customers usually request lower prices from suppliers; in addition, the supplier is asked to comply with any technical standards governing the offering, and fulfill logistics requirements. As discussed earlier, none of these initiatives are strategically advantageous to an industrial supplier. Quite the opposite. None of them require much creativity or talent, and yet, fully complying with these kinds of expectations is grueling, not to mention unprofitable.

A company that fails at customer orientation is not necessarily product oriented. As a paradigm, product orientation is probably less common than one would think. This is because naïve consultants and academics tend to confuse 'product orientation' with 'operations orientation' or 'office orientation'. Or, they might confuse it with the type of corporate autism discussed in the previous chapter.

People who can't see the forest for the trees are drawn to productive and administrative operations. Worse yet, these types of activities tend to be self-perpetuating since a lot of executives invent more office tasks to show hard work and results.

Some 'how-to-do' tools (such as ERP software, or the implementation of ISO 9011 standards) are catalysts for officism or corporate autism. A company that makes improvements solely based on customer complaints, or on complying with technical standards, is a company that underestimates the importance of its product and its product's benefits.

On the other hand, if a company is truly product oriented, it will care about what its product does for the user. Above all, a supplier should understand that their entire business, operations, administration, sales and finances exist for a single, unequivocal reason: customers buy their product in order to use it and benefit from that use.

This chapter will focus on product user experience.

Understanding Customer Orientation

An industrial customer and supplier should consider that their relationship lasts (at least) as long as a product's service life. That is, assuming that a supplier wants to be seen as proactive. This relationship goes through three important stages:

1. The purchasing/selling stage: here, a supplier has researched potential capital expenditure projects, contacted customers to inform them of the offering and provide technical advice, and, additionally, provide customers with information about the commercial, logistics and production conditions of supply. Their potential customers have asked questions, learned about the technology, and compared the performance of various offerings. This stage might include involvement with distributors. More information on this intense iteration between customer and industrial supplier can be found in Chap. 8.
2. The product integration or assembly stage: at this point, a product is installed wherever it will be performing its ultimate function(s). This installation might require that a product be combined or integrated into a more complex product.

It could be the manufacturer, a contractor, or the customer themselves who is responsible for carrying out this stage. Whatever the case may be, the product should comply with technical standards, be tested prior to its use, and suppliers should train users on how to safely use and maintain the product.

3. Product use: during this stage—which, for most products, is the longest-lasting of these three—a product is 'turned on' (a reference to pressing the 'on' button) and a customer uses a product for the purposes for which they bought it. The relationship between supplier and customer continues if there are after-sale and maintenance services. Additionally, a supplier may decide to do strategic follow-up on product performance and use (e.g. this is useful for developing a better product, etc.). Finally, when a product has completed its useful service life for a given customer, it can either be resold, discarded, or recycled.

The three stages in the industrial customer-supplier relationship can be represented graphically, as shown in Fig. 2.5.

With these definitions in mind, it should be perfectly clear that the ultimate purpose of a technical product is to perform a task for the user; moreover, the benefits a customer receives when this task is performed (the *product of the product*) is the reason why the product was originally purchased.

Paradoxically, of the three stages described above, the purchasing/selling stage is the one that most industrial suppliers are committed to exploring and being creative about. It's here that, in an attempt to stand out, suppliers have devised various activities and have used up a large portion of their commercial resources. See Fig. 2.6.

It's not hard to realize that if a short-term minded supplier thinks that the first stage (purchasing/selling) is the most important one, then their research on customer needs will focus on this stage. What do customers usually ask for when they give feedback to suppliers?

1. Improved delivery times and/or availability
2. Improved technical assistance
3. Better payment periods or increased credit lines
4. Correction of x, y, z defect
5. Lower prices
6. Improved communication between companies
7. Other similar feedback

Executives are familiar with the results of these conventional iterations between industrial customer and supplier: attempts to improve logistics, cost reduction programs, bringing a product up to par with technical standards, etc. Unfortunately, it's easier to reproduce these types of initiatives than it is to design, manufacture and sell a new product.

This implies that a supplier's competitors will also focus their energies on purchasing/selling or assembly/integration; meaning that any improvement carried out by one supplier, will rapidly be imitated by others (offers become homologous

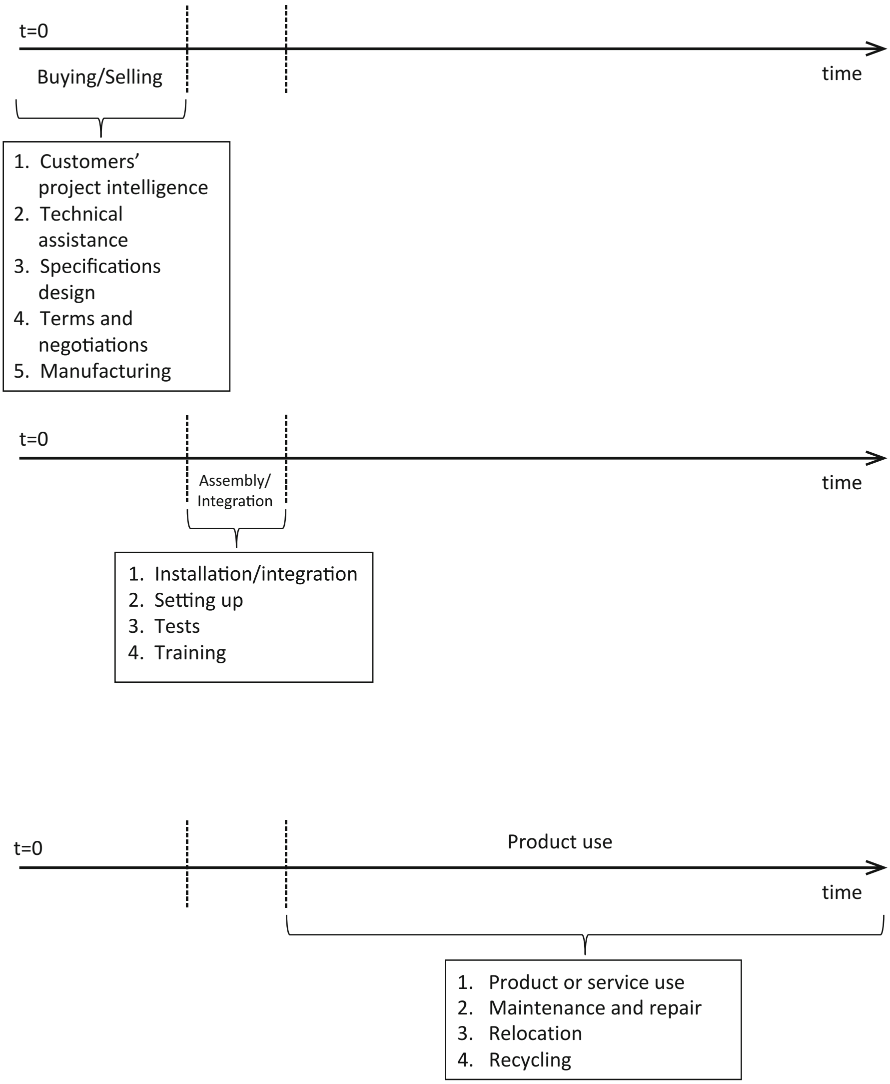

Fig. 2.5 *Top*. Purchasing/selling experience. This timeline depicts three basic experiences between a supplier and industrial buyer. The purchasing/selling experience begins following t=0, along with typical supplier-customer iterations. *Center*. Assembly/integration experience. Following the purchasing/selling experience, the product/service must be installed, assembled or integrated. *Bottom*. Product use experience. After the assembly/integration experience, the product/service is put to use. This diagram shows the common activities that take place during this phase

during the purchasing/selling and/or assembly/integration stages). The effect, which is clearly visible in several modern-day industries, is an over-abundance of complementary services that don't single out any one supplier, but that nonetheless make the entire industrial chain more expensive. As a result, a supply company that began

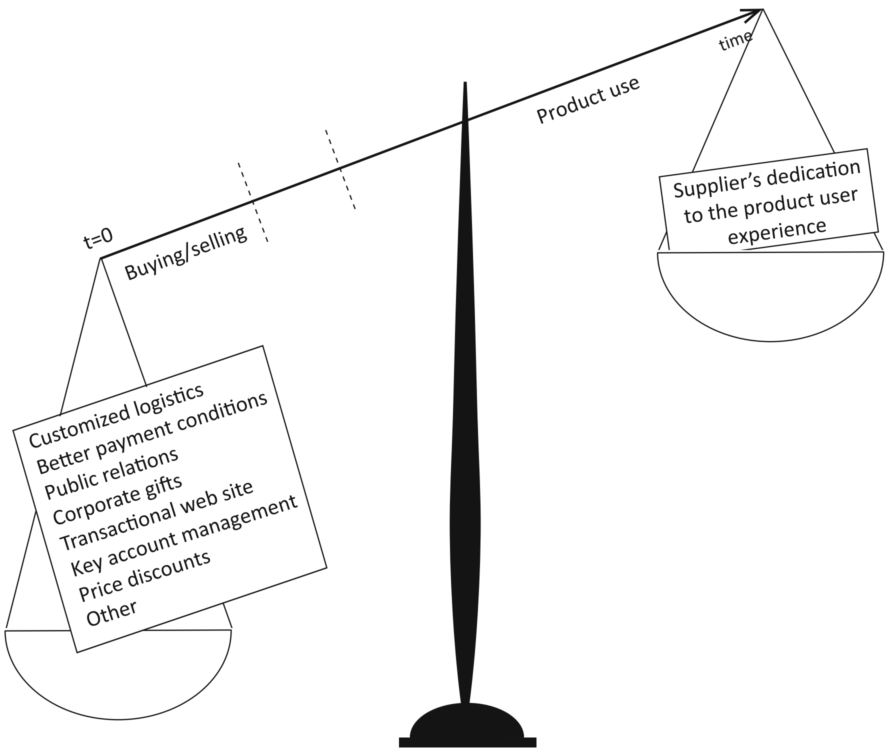

Fig. 2.6 Most industrial suppliers' efforts and energies have centered on pursuing 'differentiation' during the purchasing/selling stage. The remaining stages (assembly/integration and product use) are usually only taken into consideration when something 'fails' or if the possibility exists to generate more sales (replacement parts, maintenance or repair services)

with a single commoditized product ends up with two commodities: both the product and its complementary services.

This can be incredibly frustrating for executives who adhere to this paradigm. Frustrating and exhausting. Organizations that think of business in this way, are breeding grounds for mental illnesses and are, moreover, terrible professional schools. Academia is partly to blame for this sort of frustration; academia has likewise confused *customer behavior* with *customer purchasing behavior*.

When Excellence Doesn't Get Past the Hygienic Base

It wouldn't be fair to just write-off the logistics efforts and complementary services that suppliers offer industrial customers (and that, in fact, customers need); as such, it's a good idea to identify these needs and think of them as a *hygienic base* for an offer. This can be seen in Fig. 2.7.

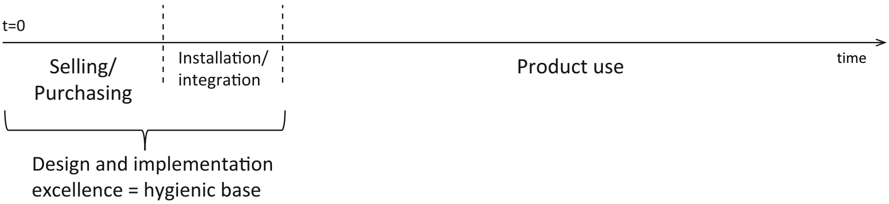

Fig. 2.7 The identification of customer needs during the purchasing and assembly/integration stages should motivate a supplier to design and implement activities impeccably. Only once this type of excellence has been achieved, can an offer be said to have acquired its "hygienic base". As a rule, progressive suppliers should consider that this hygenic base provide a competitive edge only in circumstantial situations

Nonetheless, having a hygienic base is a bare minimum. From here, a company can begin to build up its true competitive edge: improving the benefits of product *use*. This hygienic base is necessary, but it's not sufficient. It's basic, but it's not outstanding. A supplier will only stand out for these things if their competitor's performance is inadequate during the purchasing/selling stage. This occurs when the products on offer are similar (if not identical), and the only thing that makes one supplier stand out over another is their ability to provide a better hygienic base.

With this in mind, it's important to understand what goes on during the third stage of the industrial supplier-customer relationship: product user experience.

In order to explain the importance of this stage, it's necessary to refer back to the following inescapable premise: *a product is bought in order to be used and benefited from*. As a result, all of the stages that are prior to product use (contact between customer and supplier, promise of sale agreement, transaction, assembly/integration), are just a way for a customer to obtain a product under appropriate circumstances and, with time, benefit from its use. The key word here is 'time'. For the vast majority of products and services, product use is the stage that lasts the longest. At this stage, the relationship between *end-user* and *product* is fully realized; it is a relationship that, for the most part, takes place in the absence of manufacturers or suppliers. For the end-user, the product and its function are ambassadors of sorts; they represent the supplier that designed, manufactured, and delivered them.

This makes marketing activities more complex for an industrial manufacturer whose products go through several intermediaries before arriving at the end-user: now, the manufacturer has to focus on the end-user. The degree of complexity depends on a manufacturer's proximity to them.

Not surprisingly, the end-user is often seen in abstract terms by ingredient and component product manufacturers. And yet, this is the most strategic customer in the entire industrial chain. From a conceptual point of view, the end-user is *the customer*.

It's not an exaggeration to propose a new strategic goal: that industrial manufacturers understand their 'real business' as the relationship between end-user and product. In other words, business begins as soon as the product is 'turned on' (when the 'on' button is pushed) and begins to provide the use and benefits it was designed for. Everything that comes before that—including the purchasing and assembly/

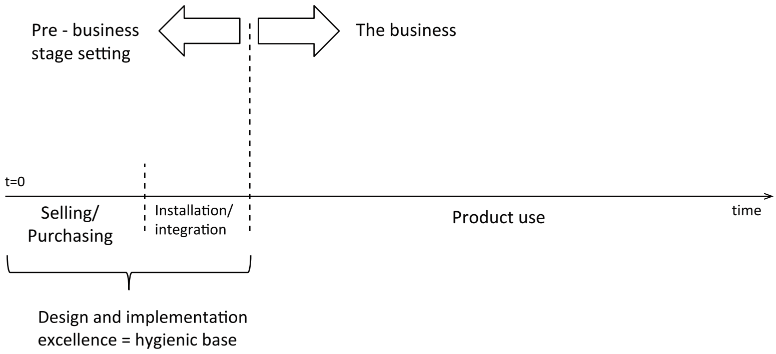

Fig. 2.8 An industrial manufacturer can think of product use as a new strategic goal. The word 'business' can now refer to how a product is used by an end-user. The activities that come prior to product use (in the purchasing/selling and assembly/integration stages) can be thought of as pre-business

integration stages—can be thought of as pre-business. This is represented in Fig. 2.8.

This line of thought differs from the traditional definition of a 'business'. The majority of executives or businesspeople define a business as a transaction in which an offering is exchanged for money. Others define a business as the physical place where goods and services are produced. The redefinition proposed here—one founded on a unique vocabulary—can be used to foster a significant conceptual change; it is a change that is much needed if product use is to become a priority.

When Good Intentions Become Strategic

In many industrial cases—especially for component and ingredient products—a product's uses become 'atomized' further down the industrial chain; so much so, that a product can have hundreds, or even thousands, of different applications. Instead of getting exasperated, marketers at these companies' should celebrate having new opportunities to better serve their users.

Thus, what a CPU (Central Processing Unit) manufacturer should realize is that when a doctor observes and analyzes a tomogram, they're using the manufacturer's product in a way that they (the manufacturer) hadn't envisaged. (A tomograph is a machine with several electronic components, among which is the CPU. These serve various functions, all of which affect the machine's overall functionality). This is shown in Fig. 2.9.

At the same time, a professional geophysicist can use this same technology for purposes that clearly differ from medical analysis. A geophysical analysis (a seismographic study, for example) might require technological variations of a tomograph. This paves the way for a commercial officer and product development department at a CPU factory to study new designs that might better satisfy these functions.

Fig. 2.9 Understanding the benefits end-users need isn't solely the responsibility of the manufacturer that produces the finished product (such as a magnetic resonance imaging (MRI) scanner), it's also the responsibility of suppliers. When other manufacturers upstream on the industrial chain research these benefits, the possibility of improving the finished product's functionality/attributes increases dramatically

What implications do these new definitions of 'business' have for industrial manufacturers? These definitions expand the strategic horizon for any manufacturer or supplier in the industrial chain, allowing them to better understand the reach of their products and develop products that fulfill different users' needs.

What Fig. 2.9 shows is this: not only does understanding a product's use provide strategic feedback to industrial manufacturers further upstream, but it also puts responsibility on each and every manufacturer to improve or adapt their product to the benefit of others. Inventive leadership (coming up with a better product to offer the end-user) is not just the responsibility of the integrator or manufacturer that assembles the final product; rather, it's the responsibility of any manufacturer in the industrial chain.

Here, the premise is that each manufacturer has expert knowledge of their own technology; in the long run, once they understand the end-user's problems and needs, each manufacturer is the most well-suited for developing a better component product.

The COP Paradigm: Customer Orientation Through the Product

Customer orientation has been defined in vague terms by academics and consultants. As a result, managers have relied on intuition to interpret its meaning. The results have been rather poor: an astonishing amount of industrial companies say that, despite their 'customer orientation', their proposals and offers are hardly distinguishable from those of their competitors. Moreover, faced by such uniformity, customers opt for the cheapest offer.

Customer orientation has been unable to specify just what its ‘orientation’ consists of. Industrial companies have used up most of their commercial creativity during the purchasing/selling stage described above. Only a few have applied their creativity to the assembly/integration stage. And, an even smaller number of commercial officers have made an attempt to systematically understand the ‘product use’ stage.

What follows is an integrating concept known as COP (customer orientation through the product). What this concept suggests is that industrial companies will progress further so long as they base their inventions and commercialization off of a product’s *use* and the benefits of that use. Product use refers to how a product is applied (what is needed from it) over time by an end-user; this is true just as much for the product as a whole, as it is for the product’s ingredients and components. An organization that rallies around this concept (from its commercial department to its production process) will be at an advantage when it comes to making multidisciplinary improvements at the core of their customer’s business.

As a result, two types of orientations that were once thought to be mutually exclusive—customer orientation and product orientation—are now integrated into a single paradigm: customer orientation through the product (COP).

As is true with most paradigm shifts, it’s easier to talk or write about than it is to go through with it. Considering that it’s hard enough to create a paradigm shift on a personal level, it doesn’t take much imagination to realize how difficult it must be on an organizational level. This is especially true for an organizational paradigm that encourages and fosters the most deeply-rooted corporate behavior of all: short-term sales behavior.

For an industrial company to fully understand and accept the strategic importance of product use (wherever it is that the product is used), it has to undergo a transformation: from an organizational culture focused on *sales* to an organizational culture focused on *marketing*. For companies where short-term thinking is ingrained in everyone from stockholders to the most recent employee, this is an almost Herculean task.

For instance, most industrial companies that are traded on the stock market have to provide short-term results to their stockholders. It’s stockholders who appoint members to the board of directors, and the directors are the ones who hire the general manager. In turn, the general manager hires his or her own managers and executives. As a result, it’s not surprising that industrial companies that aren’t traded on the stock market are the ones that invest the most in research and development with respect to sales, and that, additionally, register more patents with respect to their total number of employees.[1]

Customer orientation through the product (COP) means dividing up responsibilities; that way, a customer receives an offer that includes a hygienic base as well as a focus on product use. Having a robust organizational culture that strengthens the

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[1] The Hidden Champions of the 21st Century. Herman Simon. pp. 163–9. Springer, 2009.

customer/product relationship doesn't take away from excellent logistics performance when delivering, assembling and integrating a product. Just the opposite: this duality is similar to the two hemispheres of the brain, each one tasked with their own primary responsibilities. One work team measures, controls, and corrects performance at the hygienic level, while another work team measures, controls, and corrects product performance while the product is in use.

The Customer/Product Relationship

The anxious (and sometimes manipulative) obsession that many industrial companies have with sales, has allowed a monumental myth to develop and take root: that person-to-person relationships are the key to success in industrial sales.

A good relationship between a supplier's personnel and a customer's personnel is necessary, but it's not sufficient. On top of this, there are all of the complex relationships that exist within a whole supply chain, represented in Fig. 2.10.

A basic industrial chain can have six or more relationship arrangements between participating companies. What follows is a look at two of these: the relationship between a user and a product, and the relationships between companies.

– End-user/product relationship: any company upstream on the industrial chain needs to understand that the end-user lives with the product and, for the most part, uses it when no supplier is present (relationship N°1 in Fig. 2.10). What occurs over the course of this relationship? How does this relationship change over time? What new needs arise for the end-user? How does the product facilitate or limit the user's own progress? These questions have immense strategic importance, regardless of whether a supplier delivers a finished product or ingredient and component products.

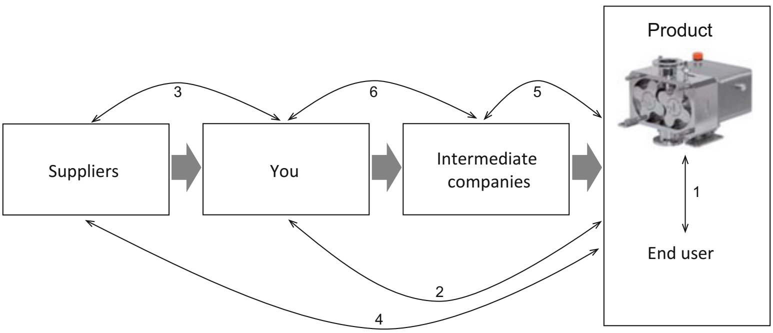

Fig. 2.10 Example of six types of relationship that exist within a simple industrial chain. Organizations with a strong sales culture tend to see relationships between companies through the traditional lens of company-buyer. Organizations with a marketing culture encourage relationships between various organizations and greatly emphasize the importance of a relationship that is frequently underestimated: the relationship between product and end-user

– The user/product relationship might take place over the course of several years; during this time, a user may receive occasional visits from suppliers. As previously discussed, these visits can be oriented in two ways: either they're sales oriented, or they're oriented towards marketing. In the latter case, the most productive visits involve exploratory research methods (e.g. Discovery Team©. See Chap. 4); the findings from this research allow manufacturers to redesign their product/service, or develop entirely new products (relationship N°2 in Fig. 2.10). On the other hand, sales oriented visits look for opportunities to sell more services, replacement parts, or learn about a customer's future projects that might require more products. These sales visits are absolutely necessary and vital to a supplier company; however, they tend to be oriented towards a supplier's own short-term benefits. Paradoxically, when a supplier puts talent, time, and resources into exploring the customer/product relationship, they ultimately facilitate the sales relationship. No doubt, suppliers that take good care of the customer/product relationship don't need to rely on 'manipulative sales'.
– Supplier company/customer company relationship: Fig. 2.10 shows relationships between different companies, including: the manufacturer's supplier, the manufacturing company (you, in this case), intermediary companies, and the end-user. The reader should be aware that this is a simplified representation of the relationships that might take place in the real world, which would include: competitors at each stage along the way, as well as various suppliers whose products are part of the final technology. In broad terms, any company that is upstream in the industrial chain, has the *right* to visit and iterate with the end-user. In fact, the *ideal* for creating technological progress is for various specialized members along the industrial chain to explore the end-user's needs. Figure 2.10 includes the relationship between the end-user, the manufacturer's supplier, and intermediaries (relationships N°4 and N°5). Similarly, the relationship between a manufacturer and its suppliers (relationship N°3) or its intermediaries (relationship N°6), should go beyond mere purchasing/selling and logistics. Their relationship should involve technology transfer and coordination, so that the technology can be made available to the end-user. Some intermediaries (e.g. integrators) also have a relationship with the product. They may require certain modifications that increase their productivity and lower the costs of integration.

Customer Orientation Through the Product (COP) Is Different from the Concept of After-Sale

Given that customer orientation through the product (COP) implies spending time and resources on business experiences that come up after a sale, it's important to highlight that COP is not the same thing as after-sale. As it's conventionally and commonly understood, after-sale is not usually exploratory. After-sale can be understood in two ways: the supplier makes sure that a product fulfills its promise, and the supplier delivers services and replacement parts. COP culture is evidenced through a product's characteristics; the exploratory research that occurs during the product

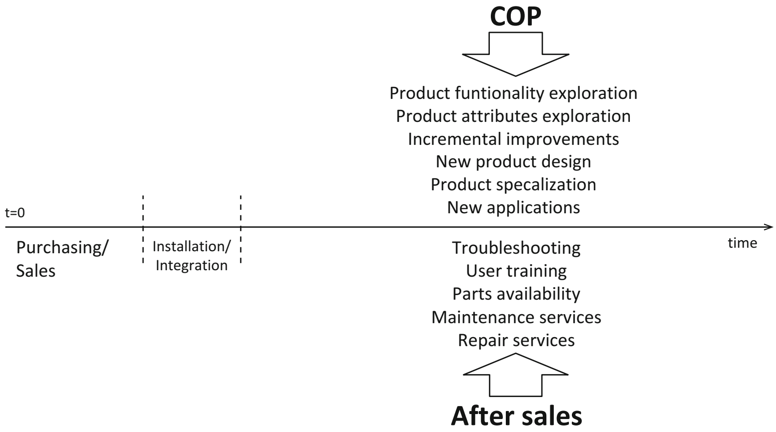

Fig. 2.11 After-sale deals with *what already exists* in a product that is being used. COP deals with 'what could exist' in a product that is being used. In order to do so, COP should codify the functionalities and attributes that each customer is looking for in a product

use stage means that these characteristics are constantly being improved. COP can also be understood as the pursuit and development of new functionalities or attributes (see Chap. 3) that benefit the end-user. Figure 2.11 shows the differences between these two concepts.

What Does Industrial COP Need in Order To Be Successful?

Before going into detail on a practical method for developing COP culture within an industrial organization, it's important to outline the basic conditions that need to be met in order for COP culture to function properly.

– Medium and long-term mentality in management: this might seem obvious, but it's not. Medium and long-term thinking is a paradigm that most managers understand, but that few are willing, or even permitted, to invest in. It requires the drive to understand, the humility to change one's personal paradigms, a redistribution of resources, as well as enough perseverance to wait for results that might not come for another 2, or even 5, years. At this point, it's worth noting that COP culture can't be successful in a company where management has a short-term and commoditized mentality.
– Short-term thinking has various, deep-seated causes. When faced by a management team, it's important to ask whether or not the board of directors has instituted short-term incentives. And, if the board of directors is short-term minded, it might be worth asking whether or not stockholders have demanded short-term returns. Whatever the case may be, the fact that a general manager's personal plan involves spending 4 years at a company, and that their 'success indicators'

are based on sales and existing profits, does nothing to help stimulate long-term projects. Perhaps this explains why in so many parts of the world, a significant number of companies alter their strategies, positioning, and planning depending on who is in management.

– Willingness to invest in research and development. When an industrial company carefully studies customer use of its products, it will soon find that it needs to improve those products or even develop entirely new products. The purpose of this research is to determine how an improved product/service design can better resolve any problems that users are having. Research and design activities, along with new product introduction activities, require expertise in various areas of a company, including: production, logistics, finances, human resources, marketing, sales, and senior management. Furthermore, it also requires a culture of cooperation with suppliers and key customers (see Chap. 6 on developing new technical products). These are all new and complex variables that the head of any industrial company should keep in mind.
– Method and planning: in order for COP culture to be successful, it's not enough to merely understand the concept and feel inspired by it. Nor is it enough that several people in a company might share this initiative. It requires a method and planning. This method should eliminate any reservations people have about COP culture that could diminish its momentum; moreover, it should avoid common mistakes that could negatively affect results. Likewise, planning is important since it gives the people that pursue COP a sense of security and confidence; this means that the uncertainty people feel as they search for new ideas isn't made worse by doubts about how to bring those ideas to fruition. Lastly, method and planning make the concept of COP more cohesive and allow it to be taken more seriously, especially by team members that are not fully inspired, or convinced by it.
– An established hygienic base (or one in progress): as described in Fig. 2.5, the first two stages should be considered a *hygienic base* upon which to develop a more comprehensive form of customer orientation. This assumes that Stages 1 and 2 (purchasing/selling and assembly/integration) were carried out with excellent operational performance. If this is not the case, then it's futile to talk about a hygienic base. A company that wants to develop a COP culture, must first create a hygienic base, or, at the very least, be in the process of creating one. This so-called hygienic base should be clearly outlined by customer and supplier during customer needs exploration. The findings from this exploration should yield metric results (see Chap. 4). Not surprisingly, a supplier with a well-developed COP culture might be able to simplify (or even eliminate) certain unnecessary activities from their hygienic base.
– Personnel with an exploratory nature: the research performed by a supplier's exploration team (e.g. Discovery Team, see Chap. 4) is a crucial stage in the COP program. Creating a Discovery Team, however, requires personnel with different areas of expertise within a company, especially technical areas. This team should include both analytic and creative minded people. Their resumes should speak to their outstanding analytical abilities, as well as their outstanding creativity. And,

they should be able to foster their own exploratory behavior. For the most part, regardless of how talented they may be, the personnel responsible for commissioning sales do not fit this description. This is because they tend to 'push' for a deal rather than 'catch' customer insights, a tendency they will have developed after years of working in sales. This tendency in a commission-only sales force makes it nearly impossible for them to develop meaningful exploratory competences. A sales representative works against time, and can start to obsess over direct, high-volume customers.

– Sophisticated industrial marketing. Thus far, it's clear that industrial companies with an interest in developing COP culture must be able to explore their customers' needs, as well as be willing to invest more resources in researching and developing new products/services. Customer needs exploration and new product development are two out of three programs necessary for providing customers with a better offering. The third consists of an organization knowing how to introduce new technical products into their intended market. As will be seen in Chap. 12, the protocol for introducing new products is far more complex and nuanced than simply adding a new product to the sales force's product portfolio. Unfortunately, the history of new products is filled with thunderous and expensive failures. Overlooking a single detail in any one of those three main programs (exploration, development, and new product introduction) can make an entire project fail. An industrial marketer should never be mistaken for a mass consumption marketer. The latter has to contend with psychological factors that affect their customers' needs; as such, they devise and implement promotional programs that are built around psychological persuasion. An industrial marketer has to have considerable technical background.

The First Steps to Instituting COP Culture

The path to cultural change within an organization is a thorny and torturous one. In this regard, it's not worth asking *how long* this change will take to make, rather, the question should be when it will *begin*. This volume is not concerned with organizational change itself, a subject that has already been written about by many talented authors. What will be covered here, are those first practical tasks that can give way to a permanent COP program.

– Make the concept of COP known within your company, and commit to implementing it and encouraging its results on an ongoing basis. It's crucial to make noise and create enthusiasm within an organization. To do so, management should be passionate about this concept and insist on seeing its results. This is the only way for an organization to build up people's expectations and assure them that this is the correct way to create the company's future. A COP program should never take place behind the scenes (this is tempting for those with an excessive fear of failure). It's important to know about other cases of industrial companies that have successfully explored and implemented this idea in the past.

Within a company, there might be some skepticism about the possibility of decommoditization. Yet, a company's most adventuresome and creative members have a responsibility to keep up momentum and inspire others to look for not one, but multiple opportunities that might lie just beyond their doorstep. In part, this conviction may stem from the fact that an organization is the only one in its industry to understand the COP and attempt to implement it. For similar reasons, it's a good idea for sales and marketing managers to provide COP workshops for the whole organization. These workshops should go over the protocols of COP implementation, successful yet credible case-studies, and encourage people's enthusiasm. Each time the Discovery team goes out on field visits (see Chap. 4), company members should know about it; and, if any tangible progress is made, the team should give the company a general update on their achievements. An organization builds momentum by being fastidious about each step of the way; it's almost as if the organization were asking: so now, what will you do with this discovery? What are the practical uses of this discovery? When will you form a project that deals with these findings? When will these ideas produce tangible results?

– Create a diagram of each product's, or line of product's industrial chain. Industrial companies are immersed in a long supply chain (in this chapter, this has also been called an industrial chain). Central to the concept of COP (as well as to a company's business strategy), is having a physical diagram of each product, or line of product's industrial chain. Figure 2.12 depicts a standard industrial chain; of course, each line of product may have a different industrial chain, some are more complex than others, some are more simple than others, some are more lengthy, and some are shorter.
– Any sort of relevant link in the industrial chain should be included in the diagram, keeping in mind that each link corresponds to a different industry, and customers of these industries, until arriving at the end-user. Key suppliers should also be identified, see Fig. 2.10. Then, each link should be named according to the type of operations that characterize its industry (e.g. distributor, builder, integrating manufacturer, etc.). Given that many industrial companies don't know who their end-users are, it's enough for them to allocate a square as 'end-user'. For companies that have never before drawn a diagram of their industrial chain, this gives them a good opportunity to learn about their downstream market, and to start thinking of ways to familiarize themselves with each indirect link.
– Identify and study the end-user market. The end-user is defined as the market of companies and/or consumers that live with and use a product/service for its intended purpose. For many industrial companies, the end-user is an unknown entity. Generally, the end-user is found much further along in the industrial chain, is geographically removed, and is often fragmented. This fragmentation means that end-users sometimes consist of individual households. At first glance, *studying* an end-user seems like an abstract idea to many commercial officers at industrial companies. This is especially true for suppliers that are very far back in the industrial chain and are responsible for manufacturing component or ingredient products. However, a lack of imagination is the main obstacle that keeps them

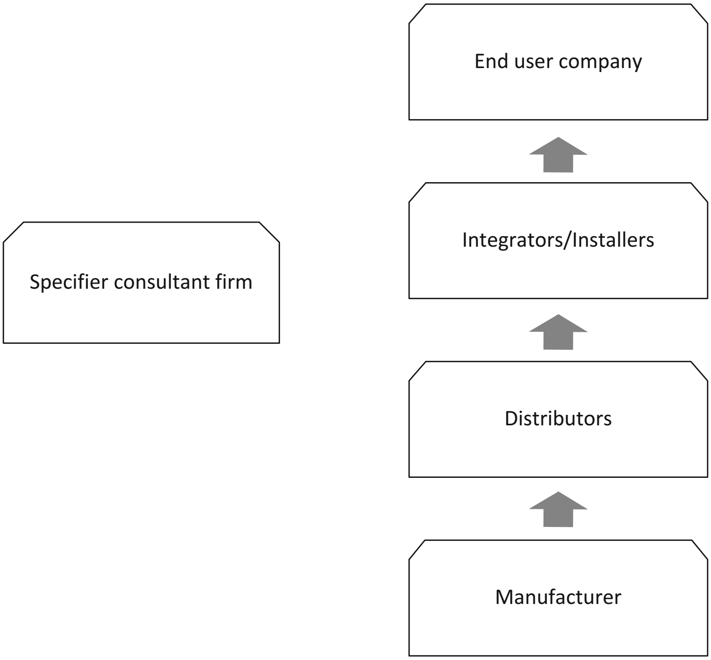

Fig. 2.12 Standard industrial chain. This figure shows an industrial chain that begins with a manufacturer (e.g. you, as a supplier) and ends with an end-user. Each link represents a customer, a customer's customer, and so on down the line. At the same time, there may also be firms that specialize in engineering consulting and engineering specifications. These might be members of the end-user's organization, or, in more complex projects, they might be independent engineering consultancy companies

from taking on this sort of initiative. Just ask these executives to take a look at the history of their own products; they'll find examples of innovations that changed the industry and created an entirely new universe of applications and functionalities further downstream. Take, for the instance, the transistor and its by-products, or chemical sweeteners, or polyethylene terephthalate (PET) and its by-products, etc. Even basic elements such as metals can be combined with any number of other chemicals in order to improve their functionalities or attributes. Here, an upstream supplier has two choices: they can either take the reigns on exploring their products' potential, or they can wait around for their customers and their customers' customers to begin calling for an improvement. On this note, it's worth remembering that there are countless historical examples of commoditized products that have been unexpectedly substituted.

Research into end-users can come up against temporary obstacles: a company's direct customers (intermediaries) may not want the supplier to get close to end-markets. Intermediaries might feel threatened by these initiatives since for them it means that a supplier might bypass them commercially (this is especially true for paranoid distributors). Here, the supplier should consider the following: first of all, since end-users are the ones who use your product, they are also your customers. Secondly, no intermediary should expect that product improvements will spontaneously occur, or that a supplier will be able to think up product improvements on their own. Moreover, an intermediary will rarely pass along innovative ideas. For the most part, an intermediary is preoccupied with resolving issues that deal with logistics, availability, and supplier and customer prices. Thirdly, the manufacturer should provide a written statement that they will not encroach upon the intermediary's business. This document should provide a general outline of what the supplier intends to do, and what they won't do. Other than that, experience shows that an intermediary will cooperate when a manufacturer does not have clear knowledge of its end-markets.

- Find out where and how a product is *living*. Once the end-markets have been identified and researched, then it's time to figure out where the product fits into this complex setting. The key is to find where the product is *being used* (performing its job and delivering its benefits). The purpose of this research is not to find your product stored away in a warehouse, piled together with other stock, or to see it being installed. Of course, no one can deny that learning about these types of situations can also lead to improvements. Ideally, however, the product should be *at work*. This work produces results that are often underestimated by suppliers but that are of great importance to the end-user. During this research phase, it's important to ask these five simple (yet powerful) questions:
  - Why did the end-user buy my product (or the product that contains my product)?
  - In what way and under what conditions does the end-user use my product?
  - What are the expected metric results of this use?
  - How does our product's performance compare to the customer's expectations?
  - Does the user employ the product in new ways or under new conditions that we had not previously envisaged?
  - Does this product serve other functions besides what we previously thought?

These questions are profound in a way that extends far beyond what comes to mind just from reading them. The example of a transistor manufacturer whose products are integrated into a scanning machine used for clinical diagnoses, goes to show how important it is to respond to these questions. The transistor manufacturer, who perhaps had limited themselves to thinking that a transistor only does what it's always done (amplify electronic signals, modulate, etc.), must now venture into other fields of science, and become familiar with the issues and complexities of other disciplines.

For the majority of industrial commercial officers, this type of proposal may seem far too abstract when compared to their day-to-day tasks. The drive to find a *new reality* for a product design is what ultimately draws a line between free-thinking minds and minds that have already been commoditized.

A Conceptual Framework for Understanding Technical Products

3

Introduction

There are some children who, from a very young age, are remarkable because of the fascination they demonstrate for the shapes and liveliness of their toys. Just the sight of them can light up their eyes and cause them to break out into a smile. They may treasure their cars, dolls, and trains for years, storing them in their original boxes, without so much as a scratch. These children have brought the adult world into their own.

Other children, however, need to know what's inside of a toy. Their fascination quickly gives way to a careful examination of how a toy works. They analyze the toy's virtues and defects, and—far sooner than their parents expect—they end up with dozens of toy parts irrevocably scattered across a table. They've revealed the toy's secrets, and they've managed to answer some nagging questions: how is this possible? How did they come up with this?

These children have met the minds of their toys' creators.

The internal world of products and services is completely different and quite often (although this comparison may be unfair) far more ingenious and beautiful than its visible exterior. On the inside, every alloy, gear, bolt, connecting rod, pulley, transmission, or electronic component has a functional purpose. Nothing is arbitrary and nothing is subjective.

The reader will be quick to note that the present chapter is devoted entirely to studying the concept of a technical product; and that, furthermore, this analysis precedes any discussion of exploration or segmentation programs for industrial markets. This is because without a clear understanding of these concepts, companies run the risk of implementing superficial market exploration and segmentation programs.

The technical product is *central* to an industrial company's strategy; this was made clear in this book's discussion of the customer orientation through the product (COP) paradigm. An industrial marketing strategist should be aware that all of a business's operations exist and function so that a customer can *use* the manufactured product and receive benefits from this use. Indeed, even more altruistic goals, such as job creation, sharing business expertise, setting an example in operational performance,

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_3

pioneership, and skill building, all depend on a company achieving its ultimate goal: provide customers with the *benefits* they need. In other words, solve a problem or a challenge. A company that fails at this goal, will also fail at its more altruistic goals (assuming that these exist and are authentic).

Unfortunately, there are a whole host of reasons why executives neglect their user-customers. The business world is saturated with nicely packaged techniques and tools that promise to turn around a company. For the most part, these tools are illusive and distracting, and they're used by executives in the hopes of finding some immediate key to success. Likewise, the majority of new commercial techniques that pop up each day are essentially promotional in nature.

What this chapter intends to show is that when a company's promotional efforts aren't based around a great product, then the company ends up undermining all of its other concomitant endeavors. Thus, what was once a pleasant work environment can turn into a nightmare, workers who were talented and self-motivated either leave the company or turn into sad and faded versions of who they once were, and what was once a promising customer/supplier relationship becomes a more distant one.

A technical product cannot just be understood *technically*, it has to be understood *conceptually* as well. The present chapter will examine the classifications and concepts that make up a technical product. Both of these are essential for developing strategies for a product, product line, business unit, or even the entire corporation.

Technical Products: Hidden, Autonomous, Functional

When It Comes to Technical Products, Professionalization Is Inevitable

In consumer markets, marketers can use market findings to design new promotional programs without there being any significant changes to a product. In numerous instances, this can be enough to generate more sales. This is true simply because market research is able to expose a consumer's psychological susceptibility to buying a certain product.

In an industrial context, however, the findings from user-level market research have a greater effect on product/service design than they do on promotional or sales initiatives. Figure 3.1 shows the conceptual difference between market research for a consumer market product, and market research for an industrial product.

Industrial marketers should think of the people that work for their customer's organization as their *colleagues,* colleagues who will eventually need functional improvements to their products/services. This is why good market research leads first and foremost to improvements in product development, as opposed to generating new promotional ideas.

Even if this research were focused on exploring logistical and distribution needs, it's very likely that its findings would lead a manufacturer to redesign operations or invest in capital expenditures.

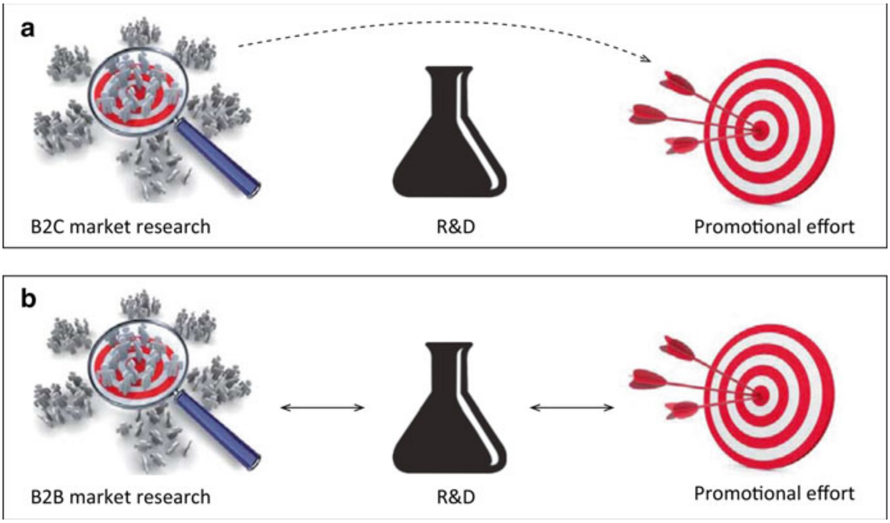

Fig. 3.1 (**a**) Consumer market research gives marketers new ideas for promotional programs without any changes being made to a product. This strategy alone is enough to increases sales. (**b**) Findings from industrial market research take into account a product's design and development. Before instituting any new promotional program, a product has to demonstrate an improved performance level

The Physical Nature of a Technical Product: Building Awareness in Order to Design a Winner Business Strategy (I)

Depending on their nature, use, and potential, technical products can be classified in any of three ways.

The Ingredient Product

This classification applies to products that are irreversibly combined with other products. This product may undergo a physical or chemical alteration (for instance, after a chemical reaction), or it may remain physically and chemically intact as the ingredient to a compound. Examples of this type of product include paint solvents, certain metals that are part of a finished alloy, raw materials, organic chemicals used in food production, etc.

Quite often, an ingredient product is governed by regulations (or norms) that determine its physical and chemical composition. This kind of product may have several different applications, and, for the most part, its downstream industrial chain is very complex. By the same token, this sort of product may have numerous functionalities depending on how it's applied by the end-user. The cost of ingredient products is often determined by supply and demand phenomena that occur during a product's maturity stage.

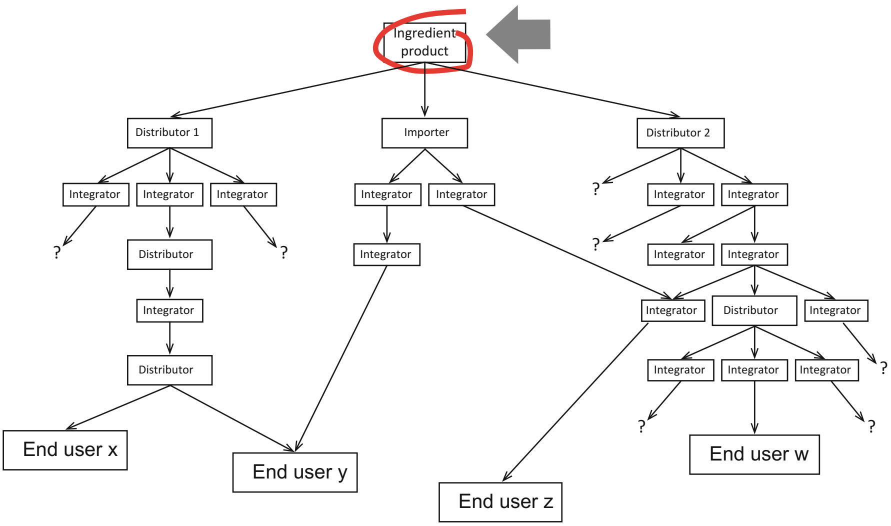

Fig. 3.2 An ingredient product and its downstream industrial chain. This diagram shows a broad, vast, and extensive industrial chain that ends with various end-users. *Each square* represents a different type of company (integrator, distributor, dealer, etc.). An ingredient product manufacturer may be unaware of the full extent of their product's applications and uses

In order to understand the strategic possibilities for this type of product, a company needs to study the structure of its downstream industrial chain. This is shown in Fig. 3.2.

This long and extensive industrial chain makes it difficult for ingredient product manufacturers to design a business strategy that connects it with its end-users. As a result, this type of manufacturer is left with a basic strategic awareness, and they focus most of their attention on a product's extraction, production, purification and logistics. For a progressive manufacturer, this same difficulty can also serve as an opportunity. In order to take advantage of it, a manufacturer must know about and carefully study the industrial chain that continues beyond their direct customers.

An industrial marketer should remember that an ingredient product's main functionality is *to provide a specific attribute to a component or finished product* (see 'product functionality and attributes', discussed below). Later, this book will explain other methods of decommoditization for non-modifiable chemical products (PTC - periodic table commodities) as well as more complex chemical compounds (CCC).

The Component Product

A component product is a finished product that has no practical use unless it's integrated into another finished product. Component products are often functional or structural units that are part of a more complex product; as such, they may be exchanged and replaced over the course of a product's service life. The component product may be complex; it might have a chemical or physical design that requires

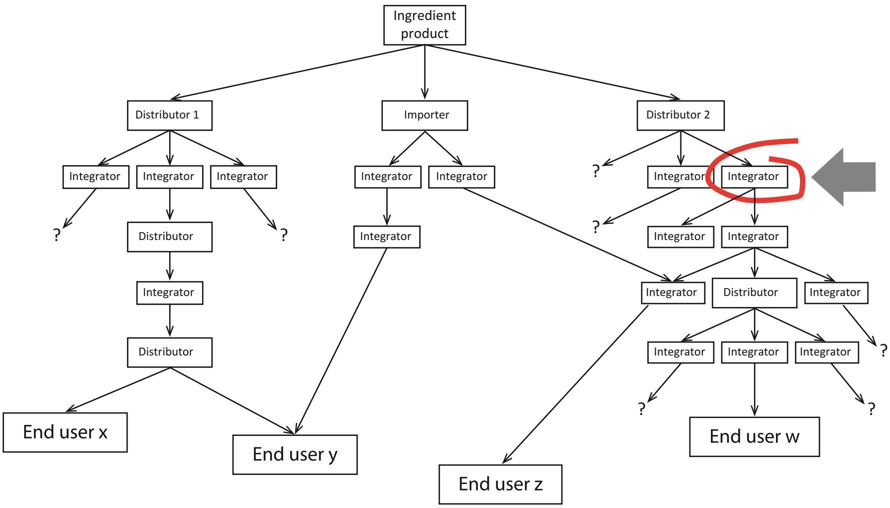

Fig. 3.3 A component product and its downstream industrial chain. This diagram shows the industrial chain in its entirety, starting with the ingredient product. By way of example, the *black arrow points* to the component product. Its downstream chain is nonetheless broad and extensive until reaching the end-user. *Each square* represents a different type of company (integrator, distributor, dealer, etc.). A component product manufacturer may also be unaware of the full extent of their product's applications and uses

multiple ingredient products. Its complexity, as well as the fact that it involves combining various ingredients, means that manufacturers have more freedom to modify and improve a component product. In turn, this freedom means that a new design has more opportunities to keep from maturing into a commoditized product; this also helps it bypass the typical pressures that supply and demand exert on prices.

A component product's industrial chain can also be vast and complex. Examples of component products include transistors, diodes, capacitors, and other electronic products. Add to this bolts, springs, chains, cables, industrial belts, bearings, coatings, reinforcing bars for concrete, etc.

A component product's downstream industrial chain is often less complex and extensive; moreover, a component product is often closer to an end-user than it is to an ingredient product. See Fig. 3.3. Even so, this industrial chain can still be complex enough that a manufacturer feels discouraged from studying its product's uses further downstream. For most component product manufacturers, it's better to think of their product as an ingredient when studying its industrial chain.

The Finished Product

A finished product is designed using multiple component products and is able to independently carry out one or more functions. One of its unique characteristics is that it progresses through the industrial chain and arrives at the end-user; this gives it the added benefit that the end-user will live with this product and be aware of its existence. Out of all three categories, this one is the most complex; this is because both the ingredient product and component product are its subsets. Finished product manufacturers have the greatest amount of freedom to redesign or improve their product, thus avoiding its commoditized maturation, indiscriminate imitation, or obsolescence. Examples of finished products include machinery and equipment. Its industrial chain is considerably shorter and more simple than those of ingredient or component products. See Fig. 3.4.

It would be interesting for an industrial marketer to stretch the definition of a 'finished product'. For instance, a newly constructed production plant could be defined as a whole as a finished product; yet, this production plant also contains machinery and equipment (which have also been defined as finished products). So, which one is really the finished product?

This is an excellent question that every manufacturer in the industrial chain should ask themselves, regardless of whether they manufacture ingredient, component, or finished products. The answer could be abstract, or even metaphysical, yet it never loses its strategic and practical importance for an industrial manufacturer.

Take, the instance, a manufacturer that makes air compressors. On its own, an air compressor is a finished product; however, as part of a production line, it becomes a component product. This duality opens up new possibilities for understanding the industrial arena and conceptualizing the benefits that a product provides.

These concepts will be analyzed in greater detail below.

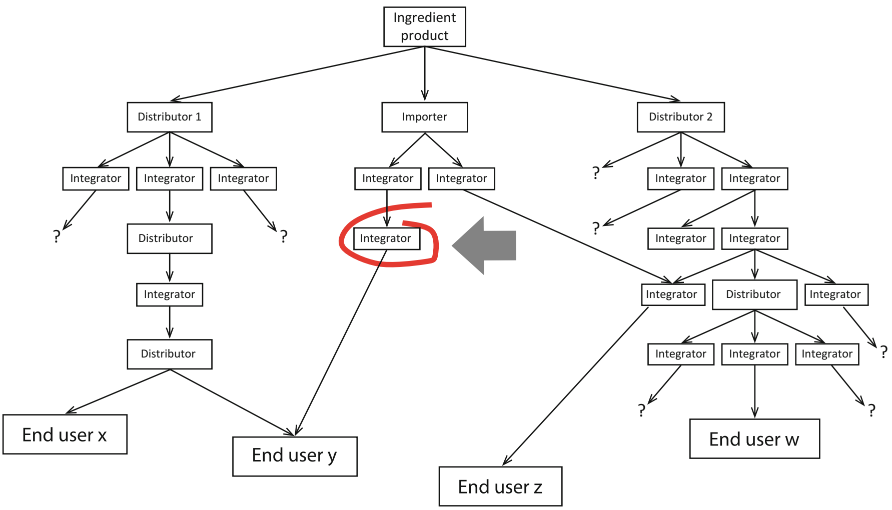

Fig. 3.4 The finished product and its downstream industrial chain. This diagram shows the industrial chain in its entirety, starting with the ingredient product. By way of example, the *black arrow points* to the finished product. Its downstream chain is short and relatively simple, and it's just a few stages away from an end-user. *Each square* represents a different type of company (integrator, distributor, dealer, etc.). A finished product manufacturer is aware of their product's applications and uses

The Conceptual Nature of a Technical Product: Building Awareness in Order to Design a Winner Business Strategy (II)

To say that a technical product is best understood as a concept will strike many industrial manufacturers as surprising and perhaps far too academic. Yet, conceptualizing a mature technical product can offer unique opportunities for decommoditizing it. The diagram in Fig. 3.5 shows how a person's understanding of a technical product can evolve; it also marks a point of inflection for business strategy: the difference between what a product *does* and what a product *provides*.

Given the above, it's not enough to know how *a product works*. What Fig. 3.5 suggests is that all industrial manufacturers (regardless of whether their product is an ingredient, component, or finished product) should study and analyze their product at the highest conceptual levels available to them.

Understanding How a Product Is Made

Industrialists that extract raw materials in their natural state tend to understand their product in terms of how it's made. This applies to people that work in industries that extract and purify minerals, cellulose, rubber, oil, natural gas, etc., as well as those

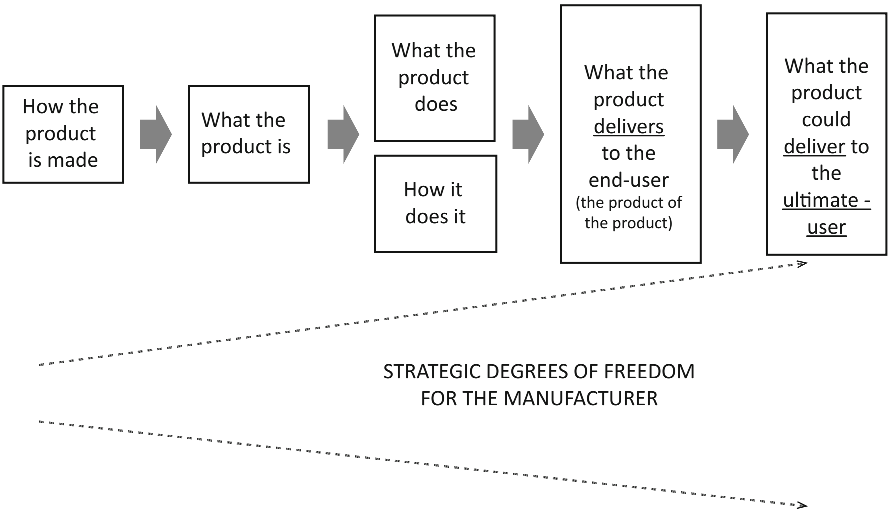

Fig. 3.5 This diagram shows an evolving understanding of a technical product with increasingly sophisticated levels of consciousness. The *left side* depicts more basic and concrete levels of consciousness; here, a product is understood on a physical level. The *right side* shows more abstract levels of consciousness; here, a product is understood on a conceptual level. Any manufacturer (regardless of whether their product is an ingredient, component, or finished product) will have better strategic opportunities if they can evolve from thinking about their product physically to thinking about it conceptually. The also applies to industrial services

that obtain their products from organic systems, such as salmon, red meat, wheat, barley, sugar, etc. They have high investment costs from things such as licenses, deposits, and production plants, as well as high fixed costs and operational costs. Likewise, given the scale of production, operations are more complex and demand time and attention from investors, directors, and executives.

This level of consciousness is restrictive since there are far less strategic opportunities to make a product stand out to clients. People that get caught up in thinking about *how a product is made* (see Fig. 3.5), tend to increase their production volume when prices are high, or reduce costs when prices are low.

Understanding What a Product Is

After understanding how a product is made, the next cognitive step is understanding what a product is. Ingredient product manufacturers often refer back to what their product is when they need to prove that it complies with the required norms or technical standards. Component product manufacturers tend to start out with this level of understanding, as do distributors and other industrial intermediaries. For example, a diode manufacturer whose products are made to match customers' technical specifications, will have a full understanding of what their product *is good for*. Their factory will also have a department responsible for analyzing the quality and integrity of goods before they're dispatched. As one might expect in this case, the strategic opportunities for a product are limited: they may only consist of consultative selling about a product's technical characteristics and availability.

Understanding What a Product Does and How It Does It

This type of thinking is rather uncommon amongst ingredient product manufacturers, and is more common amongst component or finished product manufacturers (for many ingredient product manufacturers, the industrial chain is far too extensive and atomized to spend time trying to understand it). Likewise, it's the more sophisticated distributors that think on this level.

For instance, an industrial press manufacturer will say that the purpose of their product is to 'press'. This definition clearly reflects how the product 'operates'.

How frequently or effectively a company reflects on these issues (of *how and what a product does*) depends on whether they have the chance to iterate with the end-user. The strategic opportunities for this stage are still limited, but they're considerably better than they were for the previous two stages.

For the most part, a company's salespeople have to be particularly sophisticated and skillful to think on this level. In other instances, more progressive manufacturers will use their customers' technical feedback to modify and improve their products.

Understanding What a Product Provides for an End-User

This is the first truly abstract level of thinking within this schema of evolving consciousness. In order to reach this level, a person has to ask themselves what benefit a product *provides*. This should be understood as the *product of a product.*

It's important not to confuse this level of consciousness with the one discussed above (of 'how a product works'). This is when the idea of a technical product's functionality appears for the first time. For example, an industrial coatings manufacturer will only be conscious of *what their product does* so long as they describe their product's benefit as "protecting an underlying layer from the environment." If they progress towards an awareness of what their coating *provides*, a manufacturer will discover (and be able to state) that it "improves the longevity (and perhaps the aesthetics) of a customer's surface or material." Soon, this manufacturer might even discover new benefits that their current product design may or may not allow for.

A transistor manufacturer, for example, knows that a transistor traditionally amplifies and modulates electric currents. However, what a transistor *provides* is sequential control, protection for other components, signal accuracy, etc.

Companies with this level of consciousness have far better strategic opportunities than companies that remain stymied at lower levels of consciousness (such as the ones described above). To arrive at this level, a company has to familiarize itself with where its product is being applied and who the end-user(s) are. As a result, it's easier for finished product and component product manufacturers to develop this level of consciousness.

Understanding What a Product Provides for the Ultimate Customer in the Industrial Chain

For an industrial strategist, this is where a whole other world of possibilities presents itself—both in terms of strategy, as well as business development. Here, an industrialist explores and discovers their product's functional reaches and benefits, going beyond whomever uses and lives with the physical product. This 'beyond' refers to the *ultimate customer* in the industrial chain (this should not be mistaken with the end-user).

For instance, a transistor manufacturer may be aware that their products have been integrated into a medical scanner used to take axial tomograms. The transistors in the scanner make it possible for various electronic components to communicate with one another. The end-users are medical professionals at a hospital. Yet, the ultimate customer is the patient that receives a more precise diagnosis of their health.

Even though the transistor is just a component in a finished product (an axial tomograph), its manufacturer can increase its own awareness (and even take charge) of the transistor's potential benefits for the *ultimate customer*.

For an axial tomograph manufacturer, this final level of consciousness might seem more intuitive. Quite possibly, these manufacturers will already have started assessing the quality of their tomograph's images during the preceding level of consciousness (the one concerning benefits to an *end-user*).

But even for finished product manufacturers, this last level of consciousness is a wake-up call. Continuing with the above example, an axial tomograph manufacturer can do one of two things: either remain at a level of consciousness that revolves around benefits to the end-user (hospital and/or medical personnel), or expand their consciousness to include benefits, or potential benefits, to the ultimate customer (the patient). In the first instance, the manufacturer might be more inclined towards developing tomographs that are easier to use, that assist in interpreting diagnostic results, are more productive, and that are less costly. In the second instance, the manufacturer will be driven to think about the ultimate customer's needs; they may develop specialized tomographs for particular injuries or biological tissues, improve the 3D resolution, or improve the amount of detail visible at microscopic levels (thus providing better, or more prompt, diagnoses).

This evolution in consciousness—one that begins with *how a product is made* and ends with what it *provides* for the ultimate customer—is an open invitation to any and all manufacturers. Regardless of whether they produce ingredient, component or finished products, manufacturers should shift their thinking and conclusions towards the right side of the schema shown in Fig. 3.5.

Commodity Marketing: Strategic Options for Ingredient Product Manufacturer

Many ingredient product manufacturers find themselves in a particularly challenging situation. Not only are their downstream industrial chains long and extensive, but they're also faced with highly atomized markets. Given these obstacles, many ingredient product companies prefer to stick with a particular technology or supply chain, and then cross their fingers and hope for high 'demand' and high sales prices. Yet, it's precisely when the downstream industrial chain is complex, fragmented, and dispersed that a company needs better methods and more planning to analyze it. Only then will an industrial marketing strategist be able to conceptualize the nature and importance of their product and compare it to a broader spectrum of functional possibilities.

When ingredient product extractors/manufacturers start looking at the downstream industrial chain and analyzing it, they may come up against some practical questions. These questions have to do with what it means to be a business that produces raw materials:

- Seeing as how an ingredient product has to comply with certain physical and/or chemical regulations, what purpose does it serve to learn about the downstream chain?
- What can these concepts be used for if our investments and business are centered around manufacturing or obtaining a mature ingredient product?
- Shouldn't component product manufacturers (who are our customers) be the ones to develop new products and applications?

These are compelling and legitimate questions. However, ingredient product industries should still examine their downstream industrial chains and evolve their level of thinking. Not to do so would be risky. Time and again, the history of business has shown that ingredient products get replaced as soon as new or improved products are developed by manufacturers that make component or finished products. A lot of ingredient products have gone obsolete suddenly, unexpectedly, and, quite often, dramatically.

In order to discuss the issues proposed above, this book will use the term 'commodity marketing'. Commodity marketing should, under no circumstances, be mistaken for commodity promotion practices (e.g. promoting a raw material to increase its usage in new applications). As defined by this text, commodity marketing is essentially exploratory and strategic. Its objectives are to modify commoditized products through research and development, or else open up new business 'pathways' that facilitate research and development. See below.

The CCC, or the Chemically Complex Commodity

Chemically Complex Commodities (CCC) are products that are traded as commodities (through ad hoc stock markets that determine stock and prices) and are made of chemical compounds. Some examples of CCCs are: petroleum, steel, fishmeal, cellulose, etc. On a molecular level, each one of these products is chemically complex. Steel, for instance, mostly consists of various concentrations of iron (Fe) and carbon (C), as well as a few other elements such as manganese, sulfur, phosphorous, silica, chromium, nickel, molybdenum, boron, etc. There are near endless possibilities for combining these elements in varying concentrations. Currently, there are thousands of different steel alloys, and each day, new types of steel are invented. These new types of steel are well-suited for specific applications and, if these steel alloys didn't exist, these applications would either have to use some other material, or they would be left at a standstill until an appropriate material were developed.

Thus, a CCC can be modified in order to create a new compound, or an improved product; in essence, this means they can be adapted to fit the needs of a specific application. All in all, a CCC producer has opportunities to develop new versions of their product. These new versions might be better adapted to their current applications, or they could be used in new applications (e.g. methylcellulose, diethylaminoethyl cellulose, etc.).

The PTC, or the Periodic Table Commodity

As the name suggests, PTCs are chemical elements in the periodic table. A significant number of elements in the periodic table have already been industrialized. Technically, it's very difficult (if not impossible) to modify the nature of an atom (its nucleus). Copper (Cu) is copper, lithium (Li) is lithium, germanium (Ge) is germanium, and so on. These basic elements can be combined in any number of ways to create compounds and materials. Nevertheless, PTC producers/extractors are limited in their ability to develop new products (compounds) since doing so would require them to compete against some of their own customers.

There are at least two strategic possibilities for PTC companies that want to diversify their product portfolio. These are:

1. Vertical integration as a pathway towards novel formulations of PTCs: Within the fields of chemistry, physics, and new materials research, people are constantly developing new chemical compounds using PTCs. For the most part, these new compounds are developed at university laboratories, or at private research centers and laboratories, and they are generally unaffiliated with PTC producers.

   A company that produces this type of commodity can study new combinations of PTCs, as well as their potential usefulness in certain applications. Fortunately, since these compounds/materials are new or are being developed, producers that decide to do this research won't be encroaching upon their current customers' businesses. In essence, this is about evolving from producing an *ingredient product* to producing a *component product*, yet without competing with one's own customers.

   One good example of this is the emergence of semiconductors during the second half of the twentieth century. Up until then, signals were primarily amplified or modulated using vacuum tubes; silicon (Si) suppliers simply did not participate in the electronics industry. In retrospect, a silicon supplier could have either merged with or acquired another company, thus transforming into a semiconductor supplier (e.g. transistors). At that point, semiconductors were in the process of substituting a product that would eventually become obsolete (vacuum tubes). Silicon also began to be used in other technological innovations, such as silicon-based synthetic polymers, abrasives, ceramic components used for automotive applications, etc.
2. Spin-offs from a PTC manufacturer/extractor's operational innovations. Extractors and producers that deal with raw materials have to contend with a high degree of operational complexity; as a part of their operational processes, they're constantly testing out new inventions and improvements meant to reduce complexity and/or costs. To put it one way, they are veritable laboratories and testing grounds for inventiveness. This inventiveness comes into play during the operational process itself; the idea might come from a supplier, or it might be developed within the company.

   This phenomenon provides ongoing opportunities for a PTC producer: the producer can create new businesses based off of the operational technologies they develop. The possibilities for developing these 'spin-offs' are incredibly varied, and they may include products or services in areas such as robotics, product automation, production control, lubricants, equipment and machinery, loading and transport systems, new materials, purification systems, and on and on.

   The Finnish company, Nokia, provides one of the most interesting examples of this type of 'unrelated decommoditization'. Nokia had its modest beginnings in the rather basic wood grinding industry, which was then used to produce cellulose (a CCC) and paper. Through developments of its own, as well as mergers with other companies (ones that provided relatively simple products, such as rubber and telegraph cables), Nokia founded its first electronics laboratory in 1960. This allowed them to develop radio transmission equipment; initially, this equipment was used by cellulose plant operators to communicate with one another when they were in a forest, or on a mountain, and had no other means of communication. Later, deregulation of the telecommunications industry in Europe made it easier for Nokia to develop its wireless technology and become the international telecommunications giant that it was in the nineties. Unfortunately, Nokia's cutting-edge technology fell prey to the same sort of ailments that plague many large corporations: bureaucracy and a growing estrangement from their users. When a former Microsoft executive arrived on the scene, they made the decision to link the operating systems on Nokia's cell phones to Windows; this effectively destroyed any competitive chance the company might have had.

The Concept of Technical Product Functionality

What follows is an in-depth look at three concepts that are key to understanding a technical product. These concepts allow an industrial company to improve their products by prioritizing what is most important to customers: a solution to a problem/challenge.

Product Functionality

Product functionality is what results from a product being put to use; it's the main reason why an end-user buys a given product. In essence, it's an expression of the product's DNA.

It is the *product of a product*.

As such, it is deeply tied to the concept of how a product benefits an end-user. As mentioned earlier, functionality should not be mistaken for *what a product does*.

By way of example, the table in Fig. 3.6 compares the *operation* of a technical product *versus* its functionality.

Interestingly enough, a product can have more than one functionality. An electrical cable that's made with optical fiber will have the traditional functionality of 'delivering electrical energy', but it will also have the second functionality of 'delivering information'.

The advantages to being aware of—and articulating—each product's functionality(ies) are listed below:

– Understand the product/service specialization that a particular market application requires. If an industrial marketer can distance themselves from an operational definition of what a product *does* and, instead, focus on the benefits a

PRODUCT	PRODUCT OPERATION	PRODUCT FUNCTIONALITY
Hydralic press	To press metal sheets	To form shapes for automobile panels
Epoxy coating	To coat steel against oxidation	To expand the service life of the steel structure
Air compressor	To compress atmospheric air	To deliver pressurized, dry and clean air
Executive headhunting	To search and present executive candidates	To improve management quality and productivity at customer's "x" department

Fig. 3.6 Comparative table that shows the difference between what a product does, and what its functionality is

product *provides*, they'll be a better judge of whether a product's design is well-suited to its applications.

- Discover, prioritize, and highlight a product's main purpose. Oftentimes, functionality is overlooked by creators, manufacturers and intermediaries: they frequently focus on improving aspects of a product that are either unrelated, or that are of little importance to an end-user's business. The concept of functionality helps spark people's imagination and creativity, which helps them determine which product improvements are most important.
- Use awareness of a product's functionality(ies) to find or develop new market applications. When a product's functionality has been well-deliberated, well-defined and well-stated, then there are more opportunities to develop products that fall under this concept's 'umbrella'. If, for instance, a new type of surface coating technology has an antimicrobial functionality, then a marketing strategist can look for new market applications where this technology would be well-received. Figure 3.7 shows the functionality of a floor or industrial surface coating. This is a good example of how to express functionality.

Some functionality statements are more detailed depending the product's application; the statement might specify the functionality's performance objectives and provide information about a product's application. See Fig. 3.8.

If a company is interested in developing new products, a functionality statement will help them figure out *what to do*. A fuller, more comprehensive statement (one that includes functionality performance objectives), will help them understand *where and how to do it*.

Sometimes, it's easy for suppliers to articulate their product's functionality quickly and precisely. Other times, this process is somewhat slower and more abstract.

From this point of view, it might seem easy to confuse the concept of functionality with Ted Levitt's legendary concept of Marketing Myopia. In Marketing Myopia,[1] company strategists are encouraged to redefine their business in broader terms, thus giving them more opportunities for growth. A company's new definition of itself (e.g. "we're a transport company, not just a railway company") would encompass all of its products.

[1] Marketing Myopia. Theodore Levitt. HBR, Set-Oct 1975.

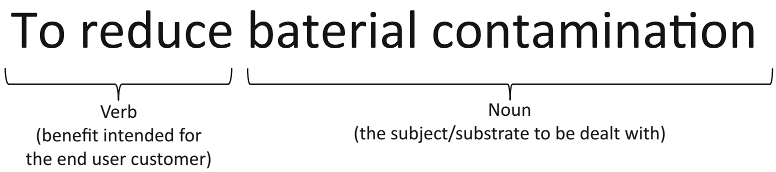

Fig. 3.7 Statement describing an industrial surface coating's functionality. Ideally, this type of statement should consist of a verb (which implies an action), and a noun (which implies the object of the action). Some functionality statements consist of more than two words (e.g. 'increase the durability of steel')

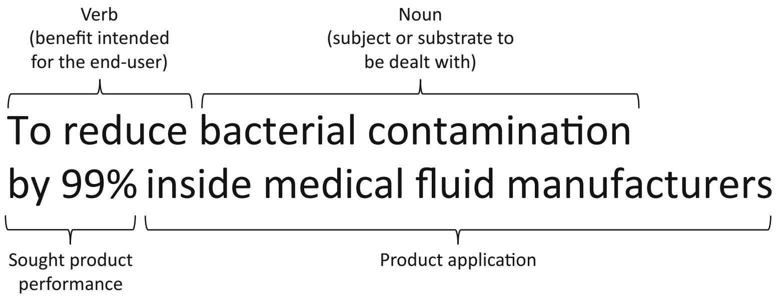

Fig. 3.8 A functionality statement is more comprehensive if it states the functionality's performance objectives (this requires knowing its expected metric performance), as well as its market application

Conversely, the concept of functionality focuses on the benefits that a *single* product or service provides. The question, "what kind of business are we?" is a question for a corporate strategist. However, the question, "what is product X's functionality(ies)?" has to do with each business unit's particular strategy.

The concept of a product's functionality is incredibly strategically important, and as a result, it's at risk of being defined far too broadly. It can get mixed-up with the type of definition in Marketing Myopia, or even with a business's own vision statement. In Fig. 3.9, this is shown under the heading 'too broad: business's vision statement'.

A good rule of thumb for defining a product's functionality (and avoiding the mistakes mentioned above) is this: a functionality statement should make it possible to *brainstorm attributes* that improve a product's functionality.

A functionality statement is inherently strategic: it is an urgent call to action for company members.

In the example shown in Fig. 3.9, the functionality statement 'reduce bacterial contamination' leaves room for a company to think up new attributes that would improve this functionality. The business vision statement in 3.9, however, is far too broad, making it impossible to come up with improvements. Additionally, this vision statement probably encompasses various product lines within the company.

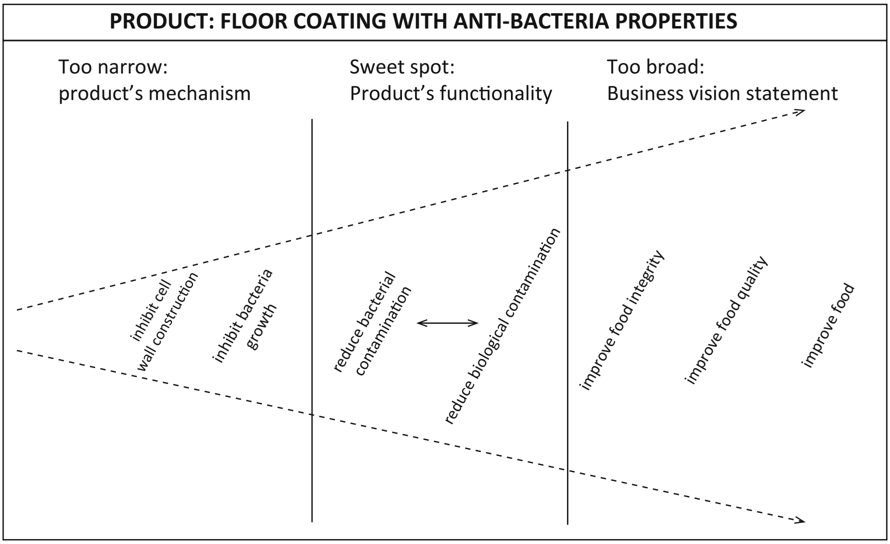

Fig. 3.9 The difference between a technical product's functionality statement and a business's vision statement. The difference between the two is not always clear; and, under certain circumstances, they might be one and the same. Nonetheless, a functionality statement should be succinct and precise so that new attributes can be developed around it

On the other hand, if functionality is defined too narrowly, it might be mistaken for what a product does (in Fig. 3.9, this is shown in the section 'too narrow: product's mechanism'); as such, it doesn't allow someone to understand how a product benefits customers.

Functionality statements are defined and stated according to a 'spectrum' (or tolerance range), the limits of which are determined by how specific its application is. In Fig. 3.9, for instance, the functionality 'sweet spot' encompasses two possible statements: reduce bacterial contamination or reduce biological contamination. The former statement implies that the product has a specific mechanism against bacteria. The latter statement implies that the product simply kills any living thing on the floor.

A technical product may have more than one functionality. It may have two, or three, or perhaps even more (although this is less common). Depending on how it's applied, the epoxy floor coating shown in Fig. 3.9, might have a second functionality. It might 'reduce glare' (this is caused by floors reflecting intense white light from the ceiling; this can be more bothersome than is commonly thought).

The most difficult functionality statements to create are the ones for ingredient products. To begin with, an ingredient product has many (perhaps even hundreds) of different applications. An industrial marketing strategist who tries to determine an ingredient product's functionalities, may, after tracing its various industrial chains, feel overwhelmed by the sheer number of applications that the product has. However, it's absolutely necessary that they identify all of a product's applications, and, specifically, that they analyze the functionality in each type of application. Doing so can be key to coming up with new ideas for product and business development.

Technical Product Attributes

These are design characteristics that allow a product or service to perform properly or outstandingly. Manufacturers need to consider how their product performs at each stage in the industrial chain, including, of course, product use.

For example, an electrical cable can be designed to be easily identifiable (by some exterior characteristic along its coating), thus benefiting every single customer in the industrial chain. Or, perhaps due to the chemical composition of its conductor, it might reduce voltage drop over long distances, thus benefiting the end-user.

This suggests that different attributes have different levels of strategic importance for a manufacturer.

Here, attributes will be divided into six categories: *performance enhancing* and *self-protection* attributes, *cost reduction* attributes, as well as attributes that are unrelated to a product's functionality, but that facilitate its *intermediation*, its *usability*, and that ensure its safety and the safety of others in the event that some *anomaly* occurs. See Fig. 3.10.

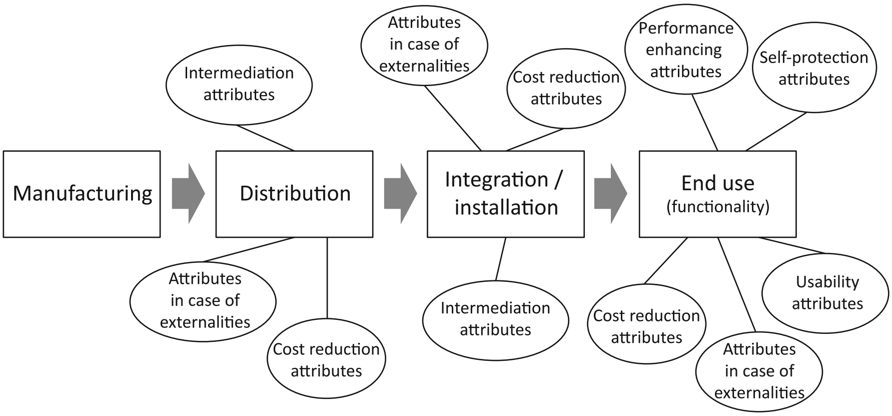

Fig. 3.10 The importance of the various types of attributes at different points along the industrial chain. Note that there are two types of attributes that are common to every level of intermediation between manufacturer and end-user. However, once a product arrives at the end-user level, its functionality requires three additional types of attributes: *performance enhancing*, *self-protection*, and *usability*

Intermediation Attributes

Intermediation attributes are characteristics that facilitate a product's distribution, installation, assembly, or integration. A company can identify them by responding to the following question:

How can we make the product more efficient and effective to distribute/integrate/assemble when it's used for X *application*?

These attributes provide benefits such as: easy installation, easy storage, safety, time saving, or they may facilitate the customer's operations. As such, a company should take into account the *intermediation attributes* that are required for each stage along the industrial chain (from manufacturer to end-user). Some examples of this type of attribute are: design of large-volume goods so that they can be easily loaded onto palettes, a box design that allows the boxes to be piled in storage, design that decreases a component product's installation/integration time, how easily a product can be identified as it moves through the logistics chain, etc.

Usability Attributes

Usability attributes are characteristics that make a product easier to use and/or keep the *user* safe. A company can identify them by responding to the following question:

How can we make the product safer and easier to operate when it's used for X *application*?

This type of attribute provides benefits such as: ease of use, user safety, and productivity. Some examples of *usability attributes* are: a well-designed control panel for operating machinery, a design that warns users of dangers and accidents, a design that makes it easy to interpret results during the product-use stage, etc.

Attributes in Case of Externalities

These characteristics ensure that a product won't cause major damages in the event that some anomaly occurs (one that is unrelated to the product's use or to the customer's operations; thus the word 'external'). A company can identify them by responding to the following question:

How can this product avoid or reduce damages caused by externalities when it's used *for X application*?

Some examples of this type of attribute are: a product design that prevents against destruction, deterioration, or security threats to personnel in the case of power failures, earthquakes, fire, etc.

Cost Reduction Attributes

These characteristics reduce a product's sales or operating costs, without impinging upon its functionality performance. A company can identify them by responding to the following question:

How can this product reduce the customer's product or service costs when it's used *for X application*?

This type of attribute directly benefits the end-user. When a manufacturer can no longer improve a product's *performance enhancing attributes* (which is always a dangerous claim), then they'll often focus on developing *cost reduction attributes* as a way to increase their sales. Technically, it's easier to improve a product's cost reduction attributes than it is to improve its functionality performance. Some examples of *cost reduction attributes* are: replacing one ingredient product with a different, considerably less expensive one (one made with a less expensive material or process), or a design that reduces maintenance and/or repair costs.

Performance Enhancing Attributes

Performance enhancing attributes are characteristics that improve a product's functionality performance. These attributes are directly related to the product's essential purpose (its functionality); as such, they're strategic attributes for a manufacturer to focus on. A company can identify them by responding to the following question:

How should the product provide its functionality when it's used *for X application*?

Remember that industrial customers buy products in order to solve a problem, and, moreover, that this use is shaped by the product's functionality(ies). For instance, the primary functionality of an electrical cable is to deliver electricity. A *performance enhancing attribute* would be any characteristic that minimizes the voltage drop that occurs in electrical conductors.

Self-Protection Attributes

Self-protection attributes are characteristics that keep a product's functionality safe from hazardous surroundings or circumstances. A company can identify them by responding to the following question:

What characteristics does this product have that prevent damage/interruptions/impairment to its functionality when it's used *for X application*?

Since each customer uses a technical product in a different environment and under varying circumstances, *self-protection attributes* tend to be more varied than *performance enhancing attributes*. Some examples of s*elf-protection attributes* are: a product design that prevents against vibrations, physical blows, contamination, or one that can negotiate various types of obstacles that arise during product use (specific to each end-user) and that could negatively affect functionality.

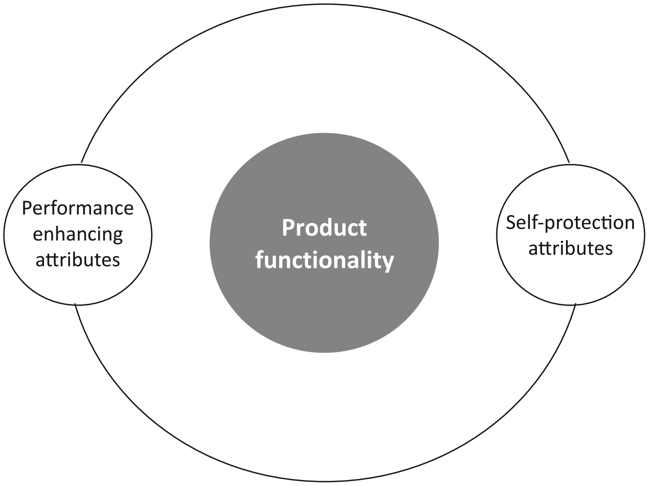

Fig. 3.11 Two types of attributes are directly tied to a product's functionality performance. Manufacturers that are more removed (both conceptually and physically) from an end-user, are at risk of forgetting or deferring these attributes. Yet, in order for a business to survive, these two attributes (along with cost reduction attributes) must be continually examined and updated

In order to develop a product concept, it's important to make this distinction between different *types* of attributes. Being aware of these six types of attributes can help someone make rational decisions about where to allocate resources and which attributes to develop, all with an eye to the target market.

By now, the reader will have realized that five of these attributes benefit the end-user. Of these five, two are directly tied to a product's functionality performance: *performance enhancing attributes* and *self-protection attributes*. This is shown in Fig. 3.11.

It's particularly important to reexamine *performance enhancing attributes* on an ongoing basis. These attributes improve a product's ability to fulfill its intended purpose, and they have a positive influence on an end-user's business.

With the exception of cost reduction attributes, an end-user won't necessarily need for the rest of a product's attributes to perform above their requirements. For the most part, *self-protection*, *usability*, *externality*, and *intermediation* attributes tend to affect end-users and their businesses only when they fail to work or are not included in the product design. Nevertheless, under certain circumstances, these attributes can give companies a definitive and timely competitive edge.

Market Applications for Technical Products

'Application' refers to where a product is used, the context of its use, who uses it, and/or when. See Fig. 3.12. Given that technical products have increasingly complex and specialized functions, the term 'application' is more fitting than the term 'segment' to describe where a product is used in the market.

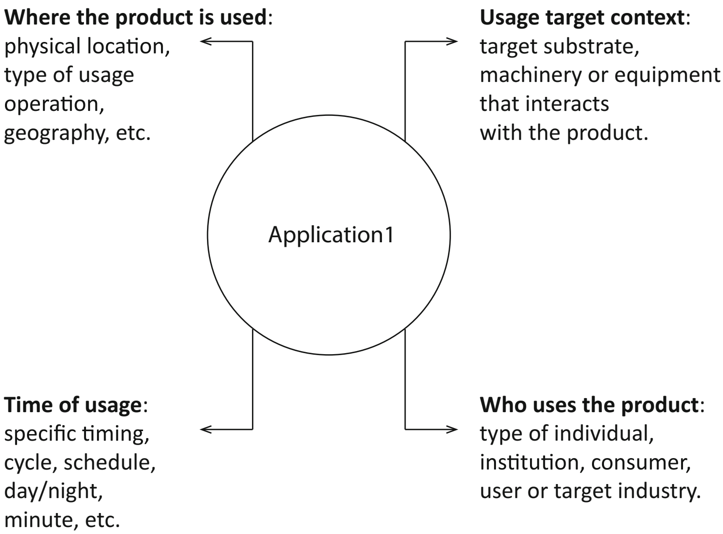

Fig. 3.12 The various dimensions of an industrial technical product's market application. Depending on the needs of its users, a product can be designed with a mind to one, or even all four, of these dimensions. Given that technical products are becoming increasingly specialized, it's imperative to have a precise understanding of what their applications are

And, rightly so. For various reasons, a product's applications change over time. Where there was once one particular application, there can soon be several, more specific applications.

The Industrial Product and the Technical Standards That Regulate Its Availability and Use

Technical standards, or norms, are a set of requirements (for the most part quantitative) that have to be satisfied by a given technical product; they can be set by a regulatory agency or by the market. Generally, a product is required to have (or not have) certain attributes before it is allowed to be commercialized. The underlying purpose of these norms is to protect people's health & safety as well as public and/or private assets. Seen this way, technical norms set by regulators are meant to promote the common good. They set a minimum level of performance: from there, the product on offer can only improve.

These technical standards can regulate any one of an industrial product's attributes: *performance enhancing, cost reduction, self-protection, usability, intermediation*, or *attributes in case of externalities*.

Unfortunately, manufacturers often think of technical standards as if they were performance 'goals'. Or as if they 'guaranteed' a product's quality.

This creates a false sense of security in a supplier, who then begins to see technical standards as goals. This type of conformism—one that has industrial companies designing products purely along the lines of technical norms—can be a powerful 'narcotic' for an organization.

There are several reasons why this type of mentality should be avoided:

- Technical standards are devised by human beings. People's decisions about what is minimally required of a technical product are based off of whatever technology and materials are available at the time.
- Technical standards that govern *usability*, and/or *intermediation*, and/or *self-protection attributes*, don't necessarily take into account *performance enhancing attributes* (attributes that improve a product's functionality). In order to improve product performance, a manufacturer can and should review *performance enhancing attributes* on an ongoing basis.
- Time and again, the history of business has shown that some technical standards have been formulated and put in place solely as result of successful lobbying by self-interested suppliers.
- Improvements in product technology lead to changes and improvements in technical standards.

The above serves as a good argument against a business mentality by which companies complacently observe technical standards, and ignore the possibility of new functionalities or new and improved product attributes.

When it comes to standardizing technical products, a more proactive objective is to improve a product as much as possible within the bounds of what's allowed. Or, better still, a company can take the lead on the technological front and help design the technical standards that will be required in the future.

A Technical Product's Impact on a Customer's Business

One look at the sales arguments that are often used by industrial suppliers, and it becomes clear that they all seem to hinge on a single paradigm: that the answer to a customer's problems has to do with *reducing costs or increasing productivity*. These might be start-up costs or they might be operating costs.

No doubt, any technical product feature that reduces costs or increases productivity will always be well-received.

For example, a new model of forklift truck might consume less fuel and it might be more agile than its competitors at lifting and transporting goods.

These products can be called 'problem-solving' products, or *solver* products.

However, some technical products are designed not to reduce costs or increase productivity, but to improve an industrial customer's competitive position with *their own customers*. These products can be called 'customer positioning' products, or simply *positioner* products.

For example, a new model of industrial lathe might come with a state-of-the-art software designed to produce a higher quality product with a greater amount of surface detail. Here, the *product of the product* gives customers a better competitive edge: clearly, their *own* product will be demonstrably better than that of their

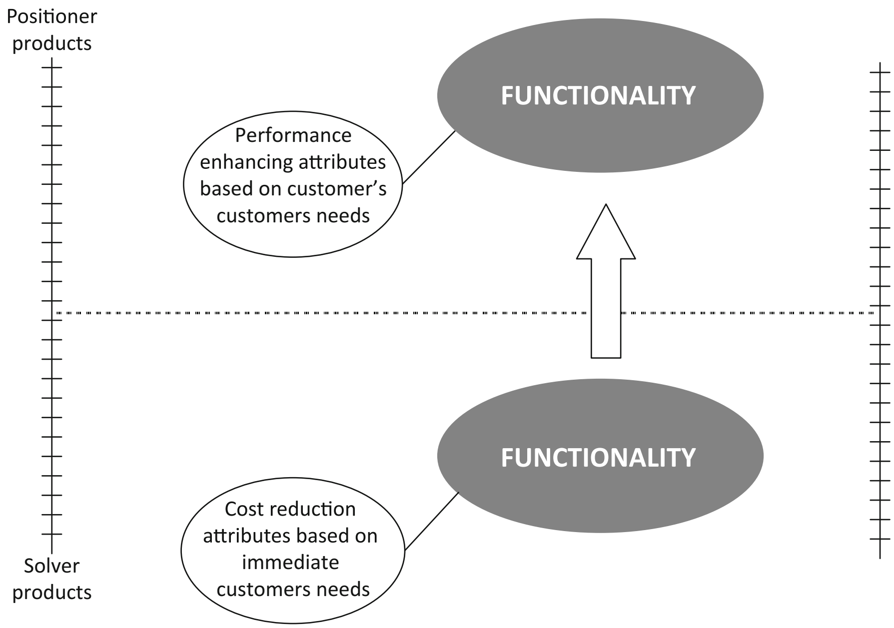

Fig. 3.13 This diagram shows how the benefits that a technical product provides to industrial customers can evolve. 'Problem solving' products and their functionalities are shown below the horizontal *dotted line*. Consultations with direct customers lead to the development of *cost reduction attributes*. Evolved functionalities that improve an industrial customer's 'competitive position' are shown above the *dotted line*. Research into downstream customers' needs lead to the development of *performance enhancing attributes*

competitors and it'll provide more benefits to their customers (that is, the customer's customer).

There is an important difference between these two concepts (lower costs/increased productivity versus improvements to an industrial customer's competitive position). Most likely, the reader will have realized that for certain applications, *positioner* products are more beneficial for a customer. And, as a result, customers will be more willing to use them.

According to this author's research, industrial customers are willing to spend a considerably higher price on *positioner* products than they are on *solver* products.

To better understand this phenomenon, we have to refer back to the concepts of functionality, *performance enhancing attributes*, and *cost reduction attributes*. See Fig. 3.13.

In essence, *performance enhancing attributes* determine how a product's functionality evolves.

For example, an industrial lathe manufacturer that takes the time to research, understand, and consider the needs of its downstream customers (e.g. end-user) will be able to design *performance enhancing attributes* that improve its product's functionality: precision turning, new shapes or textures, the product's ability to turn on a nanometer level, etc.

Conversely, if a manufacturer only gets feedback from direct customers (e.g. its distributors), it'll probably end up designing more robust machinery that has low energy consumption and is as productive as possible.

Direct customers are most likely to call for improvements to a product's *cost reduction*, *usability*, and *self-protection attributes*.

Unfortunately, not all technical products have the potential to become *positioner* products. At least, not under current circumstances or with their current design.

The products that are most likely to develop *positioner* characteristics are either ingredients or components in finished products, or equipment or services that modify a finished product as it's being manufactured. In the latter case, this includes any machinery, software, or equipment that plays a role in assembling, casting, or forming a finished product. For instance, when manufacturing high-precision mechanized pieces, there are different factors (such as the chemical composition of the steel being used) that can affect the outcome; likewise, this process can also be affected by different characteristics of the software and lathes used to shape these products. In order for a product to become a positioner product, it has to *take part in modifying* a finished product as it's being manufactured.

Products on the sidelines (ones that don't modify a finished product) have a harder time becoming *positioner* products. In some cases, doing so would be incredibly difficult, if not impossible.

For instance, a forklift truck that transports materials at the factory producing mechanized pieces will not contribute to the modifications that affect the finished product. This is also true of the building's support structure (where the customer's factory is housed), pallets, windows, mail servers, office furniture, etc.

Being more removed from a final product (from modifying it) poses a real difficulty, but manufacturers shouldn't give up on the possibility of finding imaginative ways to narrow the distance between their products and those of their customers.

Abstract Thinking and the Path to Successful Decommoditization

A vast quantity of ingredient products, as well as a significant amount of component products, can be classified as commodity products. As discussed earlier, ingredient and component products are products that are integrated into a finished product.

If a manufacturer is going to take up the challenge of decommoditization, they shouldn't limit themselves to thinking solely about their own product's functionality and attributes. They also have to be aware of the functionality and attributes of *the following product* (that is, whatever product integrates theirs into the downstream industrial chain).

For example, an electrical cable 'delivers electricity' to a mining crane. So, the question is: what is the mining crane's functionality? What are its *performance enhancing, self-protection, usability*, or *intermediation attributes*? How does the cable manufacturer contribute to the mining crane's functionality?

In another example, an integrated circuit (IC) is used as a component in a processor. In turn, this processor is used in an industrial automation system and it makes it possible for various devices in the system to communicate with one another. An integrated circuits manufacturer needs to explore end-user needs (in this case, the end-users are automated factories); this will help them understand what users require from the finished product's functionality. By understanding the finished product's functionality, the manufacturer will get a better grasp on the functionality of the processor (for which they are direct suppliers).

Only then will they fully understand and be able to articulate the functionality of their microchip. This is shown in Fig. 3.14.

No doubt, these are questions that any ingredient or component product manufacturer needs to ask themselves about the products being manufactured downstream on the industrial chain.

Industrial marketers might be interested to realize that by adding a new attribute to their product, they can improve the functionality (or even create a whole new functionality) in a more complex product further downstream on the industrial chain. The evolution in the chemical composition of plastic provides the quintessential example of *an attribute that turns into a functionality*. For instance, certain chemical modifications (new attributes) gave rise to vinyl, polyethylene, polyvinyl chloride, nylon, polyester, polypropylene, polystyrene, etc. In turn, each of these new compounds gave rise to new functionalities and products downstream on the industrial chain, and, in some instances, even created entirely new industries. This has lead to new functionalities in areas such as structure, aesthetics, containers, storage, insulation, elastics, etc.

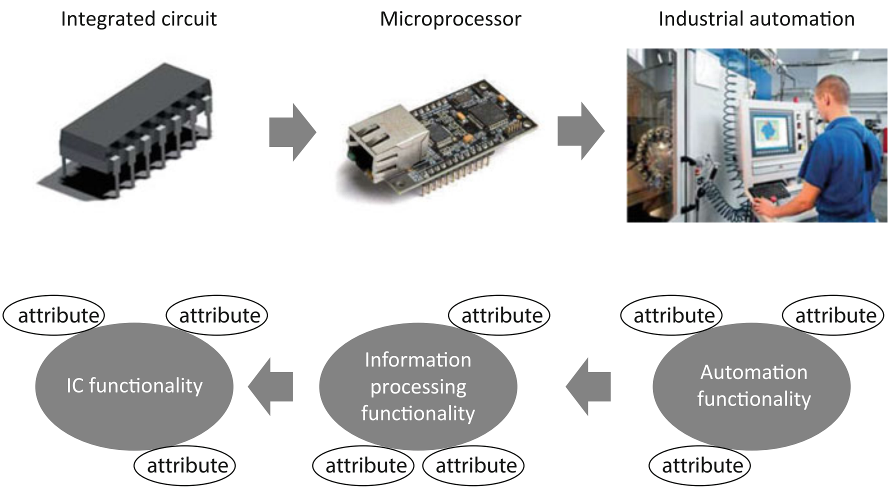

Fig. 3.14 In order to decommoditize a technical product, an industrial marketer has to consider their product's functionality when its used for its target application. When one product is used as a component in a more complex product, a marketer should research the functionalities and attributes of the latter, finished product

Technical Product Performance

A qualitative understanding of a technical product's functionality and attributes must be backed up by a quantitative method for measuring its performance. This makes it possible to see how well the product performs compared to performance requirements for a given application (these requirements should also be measured metrically). Without a performance metric, a company's industrial product development and sales are based solely off of impulse.

A performance metric should consist of:

– Statement declaring the product's functionality and/or attributes
– Indicator(s) used to measure performance
– Figures or numbers that indicate performance results

For example, for a given transistor model, the performance metric should be as follows:

– Amplify the supply voltage for a cooling engine
– Voltage gain (Av)
– 25

During the product development stage (or maybe even beforehand), an industrial marketer can use this metric to examine their product's performance level and the performance level of the component/finished product downstream on the industrial chain.

Additionally, an industrial marketer can use this metric to determine whether a product's performance exceeds or fails to meet requirements for a specific application. Both types of findings can be advantageous. If a product exceeds requirements for a given application, it can be redesigned, which means lower costs for the manufacturer and lower prices for customers. By doing so, a manufacturer can access new, more price-sensitive markets.

On the other hand, if a product fails to meet requirements, it should be redesigned so that it gives customers the results they need (and are not currently receiving).

Because industrial products are incredibly technical and complex in nature, it's very likely that several of a company's products, when used for certain applications, exceed requirements in some areas, while failing to meet requirements in others. In order to figure out where these performance gaps are, an industrial marketer should accompany technical personnel on frequent field visits. This issue, and its consequences, will be dealt with in Chaps. 4 and 5, respectively.

Lastly, developing a performance metric allows a company to compare their product to similar products offered by competitors. Given the technical nature of these products, it's important to remember that an industrial customer will be looking for whichever products are *most appropriate for* or *best at* a given application. Figure 3.15 provides an example of a comparative table.

Following this analysis, an industrial marketing strategist will have two very precise tools at their disposal: on the one hand, a correct statement of a product's

Requirement statement	Metric	Product performance (output data)	Competitor's product performance
To amplify the supply voltage to the cooling engine	Voltage gain (Av)	25	23,5

Fig. 3.15 Example of a metric table that compares a product designed by one company to a similar product designed by its competitors. Here, the product in question is a transistor. The table should include a performance statement (functionality and attributes), the metric indicator, figures showing performance results (after doing field tests), as well as a figure indicating the performance level of a direct competitor's product

functionalities and attributes, and on the other, a correct measurement of their performance.

The Concept Behind Industrial Product Categories

In and of itself, an industrial product category is a *generic brand*: it's used to define a family of products that share similar characteristics and are used for similar applications. Some examples of generic industrial brands are Cloud Computing, ERPs (multifunctional business software), steel profiles used for construction panels, ball valves, pop rivets, etc.

Transistors are a good example of how a single product can (depending on its design) be divided up into multiple categories: bipolar junction transistor, field-effect transistor, ballistic transistors, diffusion transistors, single-electron transistors, multi-gate transistors, CNFET, JFET, MOSFET, OFET, etc.

Thus, by definition, a 'product category' encompasses a family of designs, brands and suppliers that are all known for one or more functionalities they share in common. As such, one technical product category can compete against another, and even replace it (e.g. ERPs *versus* Traditional System Development).

Why is it important to get to know an industrial product's category (or lack thereof)?

It's important because if and when a new product creates a new category, it's quicker and more efficient to introduce it into its target market using industrial marketing techniques centered around product categories (see Chap. 10). It's good to remember that, for the most part, a new product will have to compete in the marketplace against a concept that is older, and perhaps more deeply-rooted.

Moreover, if a product is well-known but its category is somewhat ambiguous, then an industrial marketer should clearly identify and explain which category it belongs to.

People that create a new product category are often unaware that they've done so, thinking instead that what they've created is simply a great new product. A new category can displace a previous one, or make it obsolete (in some cases, a product design might be enough to replace an entire category; this, however, is more rare).

For example, aluminum (a product) could replace copper (a product) in applications where electricity is conducted from one place to another. Yet, Cloud Computing (a category, with many possible designs and architectures) could replace in-house company servers (a category, with many possible designs and architectures). Categories are more robust because they have a wide range of designs and alternatives; as a result, it's much harder for a single product to replace an entire category.

For a developer, there are certain situations that indicate when a new product has the potential to become a new category:

– A product has outstanding functionality and attribute performance; this suggests that a product has a lot of potential and could reasonably be expected to replace a current technology.
– A supplier/developer has the commercial need to (eventually) license out its technology to other manufacturers who can help promote it.

These definitions are far from theoretical or abstract. The human mind is constantly trying to classify and understand its environment, and, consequently, creates names for things that affect its personal well-being (in this case, the mind has to contend with the organizational well-being of an industrial company). In order for government agencies and regulatory bodies to classify, regulate, and control a product's characteristics, a product has to belong to a category (e.g. hydrating drinks meant for athletes or unwell patients).

Some product categories might arise inside of other categories. Yet, for this to occur, a subcategory has to go through the same formation process as whole categories. This is shown in Fig. 3.16.

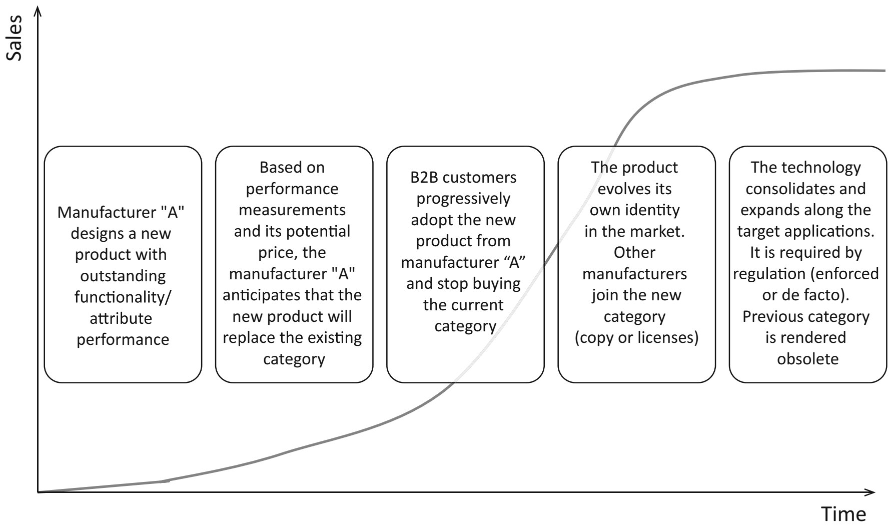

Fig. 3.16 The origins and subsequent development of a new technical product category; other competing manufacturers also participate in this process. For a new technical product category, a key part of its identity lies in its generic name

A Technical Product's Life Cycle: Riding on the Back of a Phantom

Not only is product life cycle theory (PLC) well-respected, but it's been proven true on countless occasions. Companies whose products have short life cycles will find that this theory is especially helpful for planning new product development.

However, none of this is to say that the curve on a product's life cycle graph is deterministic. Except for the introductory stage (which is the most clearly recognizable), an industrial marketing strategist won't always know how far along a product is in its life cycle. Sometimes, people mistakenly believe that a product is in its maturity stage when, in actuality, the product is just 'resting' within an overall period of growth. Naturally, it's their competitors who end up capitalizing on this growth.

It's widely known that a product's life cycle consists of four stages, and that different marketing concepts and techniques apply to each stage. And, on top of this already complex situation, most ingredient and component manufacturers find that their product's life cycle occurs within an even larger cycle: *the industrial chain life cycle*. See Fig. 3.17.

The industrial chain life cycle is equivalent to the life cycle of the finished product category (e.g. gasoline engines). In turn, this cycle determines the life cycles of the various component products it's made of or, at least it does during the product's introductory, growth and maturity stages (a component product can go obsolete for various reasons that are unrelated to the life cycle of the industrial chain).

If a finished product category begins to go obsolete, then, inevitably, its component and ingredient products will begin to go obsolete as well. As such, an industrial

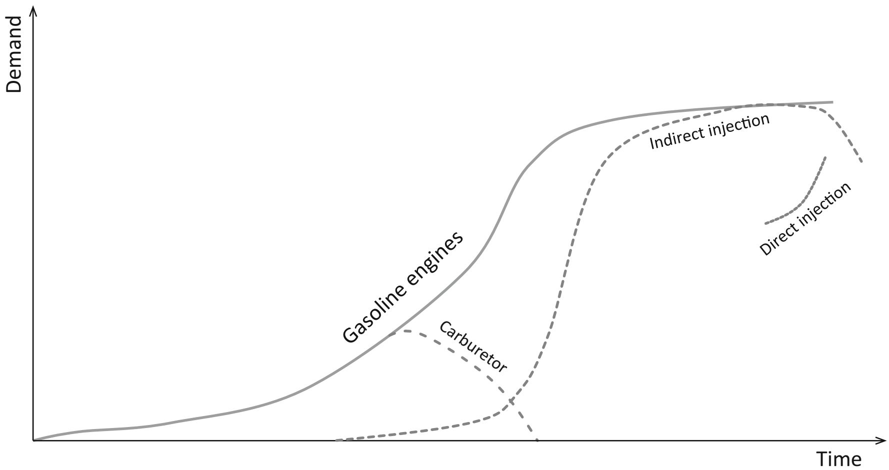

Fig. 3.17 For the most part, a technical product's life cycle depends on the life cycle of whatever product or technology it's integrated into. As such, an industrial marketer should be cognizant of other products' life cycles further along the industrial chain

marketing strategist should be alert, not just to their own product's life cycle, but to the life cycles of more complex products found downstream on the industrial chain. Another reason for technological obsolescence occurs when customers solve a current problem by addressing a more fundamental cause to it (e.g. the use of hearing protectors in a noisy customer facility will no longer be needed if the noise level is lowered to a safe level).

By learning about the dynamics of these indirect markets, an industrial marketer will be able to secure greater opportunities for their product or technology, anticipate their product's obsolescence, and, not infrequently, work with integrators or finished product manufacturers to promote their category during periods of maturity or decline.

4 Exploring Industrial Markets

Introduction

Were Christopher Columbus, Charles Darwin, or Yuri Gagarin to have attended your typical business program from the start of the twenty-first century all of them would have been taught to stick close to shore.

For some reason (one that it's not worth getting into at the moment), modern-day concepts of market research have only accentuated the already paradigmatic and complacent officism that plagues company administration. In today's world, there's an over-abundance of chalkboard-style research techniques that are used to find out about the world without ever once leaving the office. Unfortunately for executives, these techniques and their various scorecards are very enticing. Far too many companies have gotten used to outsourcing their market research; arms crossed, they wait around to be handed graphs and conclusions about what goes on 'out there'. Other companies may venture out to explore what their immediate customers in the industrial chain have to say, and it's not uncommon for companies to think that their sales force provides them with enough information.

As discussed in Chap. 2, officism is a symptom of a larger problem. Without some sort of understanding of what actually occurs in the field, office workers or senior management (on their typical, once a year, 'strategic' retreats to a nice resort) can only *invent* things to do.

What is it that inspires an industrial company and makes it willing to spend resources on well-conducted market or customer research? The answer is more subtle than it might seem, and it largely depends on a company's culture.

Figure 4.1 shows the evolution of an industrial company's corporate consciousness.

The most basic level (which, in this case, has been arbitrarily assigned a 15° visual field) applies to companies that are almost entirely focused on operational issues, either with regards to production or administration. For businesses that are just starting out, this level of consciousness is normal: they need to make sure that their machines and financial processes are in basic working order. In reality, it's

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_4

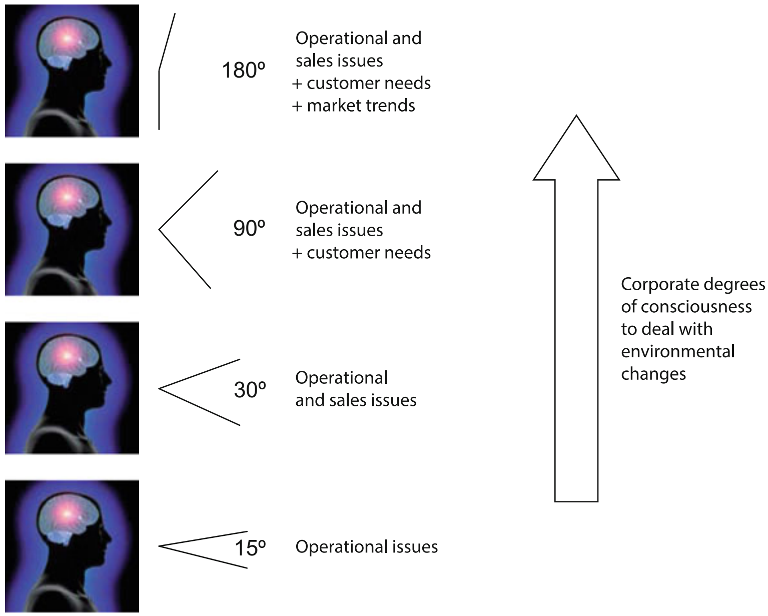

Fig. 4.1 The four levels of an industrial company's corporate consciousness (a measurement of its awareness of its surroundings). In this author's opinion, the majority of industrial companies *reside* at the second level. The issues that are usually discussed at managerial meetings are a good indicator of which level of consciousness a company is at

very rare to find an established company that consistently operates on this level. However, they do exist! Companies with high fixed costs that are used to medium to long-term contracts with customers can easily settle into this very elementary level of consciousness about their surroundings.

The second level (shown here as having a 30° visual field) describes industrial companies that are fully immersed in a sales and operations culture. At this level, companies are entirely focused on operational issues (production, bottlenecks, delivery times, refunds, costs) and sales (invoices, credit, payment options, cash flow, customer complaints, etc.). These companies will rarely, if ever, discuss any other type of strategic issue, and they'll only take on more abstract concepts when it's for the sake of some corporate investment opportunity (e.g. buying another company, entering a new market, investing in new assets, etc.). In this author's opinion, the majority of industrial companies *reside* at this 30° level. Here, marketing is seen as a form of selling, one that handles brochure designs, web content, corporate gifts, and preparation for trade fairs. These companies burden their sales force with unreal responsibilities, albeit not because they think their sales force is a human resource with the highest degree of professional competences. Rather, it's because their sales force supplies them with the funds they need to stay afloat. As a result, the sales force is regarded as 'the voice of the market': the sales force is responsible for knowing what goes on out there, and they're the only ones that interact with customers on a routine basis. Figure 4.2 summarizes the paradigm that occurs at a 30° level of consciousness.

To produce → **To sell**

Fig. 4.2 In sum, companies with a sales culture exist for the sole purpose of making money. Under this paradigm, their operations are centered around producing in order to sell (this is done with support from other areas of company administration)

For an industrial supplier, the third 'level of consciousness' (shown with a 90° visual field) is where *customer needs* are—for the first time—taken into consideration; this is done in order to improve both the customer's as well as the company's business. Here, understanding customer needs is regarded as a crucial factor in the company's future; as a result, this company has arguably evolved from a sales culture to a marketing culture. In the latter case, people get into the habit of continually exploring their market environment, getting ahold of information and bringing it back to be analyzed. Once in possession of this information, the company can improve or develop new products, and then systematically introduce them into the marketplace. Whether in a formal meeting or in the hallway, it's common for people at these companies to talk about whether or not product x is functioning properly, or about such and such findings from the Discovery Team© (see below), or about the various functionalities that different customers want from a product, etc. This industrial company has managed to evolve and mature how it thinks, speaks and acts both inside and outside of the company. Unfortunately, within the known universe of industrial companies, very few have actually reached this level.

Moving past level 30° requires leaders with outstanding intellectual capabilities: people with the power and strength to provoke the immense cultural change that's implied in going from the second to the third level (a 30° to 90° visual field). The graph in Fig. 4.3 illustrates the type of paradigm that typifies this level of consciousness.

Not only are a lot of executive leaders unaware of this business principle, but they act against it. Quick success, sales goals, immediate returns to stockholders, daily stock prices—none of these are compatible with the long-term. In the minds of these executives, the long-term takes time away from the present.

At the fourth level, (shown here with a 180° visual field), a company's consciousness expands to include a further strategic element: awareness of market or industry trends that occur over time. Understanding market or industry trends requires just as much method as it does intuition; it allows companies to better prepare themselves for oncoming paradigm shifts, gain competitive advantages, and identify new strategic opportunities. People who *periodically reach* this fourth level of business consciousness are the kind of people who analyze their product's life cycle and the *cycle of demand* for their product (see Chap. 3). For instance, a steel company that studies future skyscraper designs (including any architectural, technical, or environmental demands) will be better equipped to develop new types of steel alloys that give more freedom to up-and-coming architects. This company will also want to launch these new products in other markets. People that think and make decisions from this fourth level of business consciousness often refer to Ted Levitt's powerful concept of 'Marketing Myopia'.

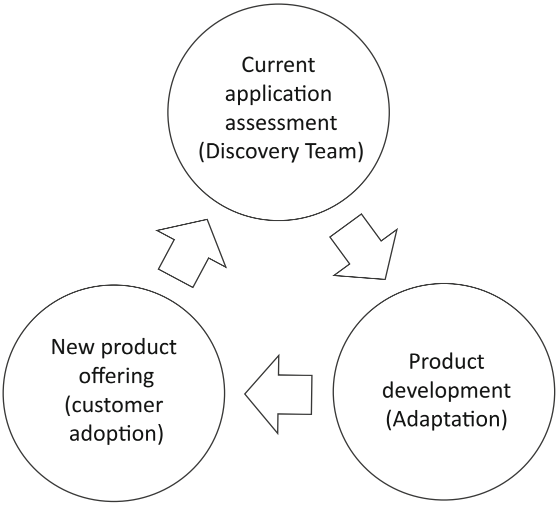

Fig. 4.3 This 'triple A' cycle represents a new type of industrial marketing paradigm. This paradigm is fitting for the twenty-first century, and for the organizational culture at industrial companies more generally. This cycle consists of an ongoing understanding of product applications, ongoing product adaptations (R + D), and customer adoption of a product

A big difference between the third and fourth levels of consciousness is *temporality*. A product that's introduced into the marketplace by a technological leader, or a trend-setting company, will eventually end up being manufactured by all of the companies within that industry. However, by the time that happens, the first company will already be introducing new versions of the product, or completely new products, or it will have prepared themselves to enter more attractive cutting-edge markets (creation of niche industrial markets).

Readers are invited to use this 'levels of corporate consciousness' model (Fig. 4.1) to determine which level their company is at. Before discussing market research techniques, readers whose companies are at levels one or two should be aware of the conceptual (and cultural) gap that keeps them from developing better business objectives. Companies at the third or fourth level of consciousness see market research as a strategic, ongoing process that is essential to the company's future.

Different companies with a sales culture (level two) react differently about the prospect of market research. On the one hand, some companies are open to conducting market research even though they may misunderstand the deeper reasons for doing so. These companies tend to think that market research is about getting customer feedback, finding out what the customer thinks of them as a supplier, or finding out what weak spots the company should improve in order to become more competitive. At the very least, this is better than nothing.

When it comes to industrial market research, motivation is necessary, but it is not sufficient. Unfortunately, even motivation is hard to come by since commercial officers prioritize short-term sales over taking the time to understand customers.

These executives may give several reasons for why they don't conduct market research, some of which are:

– We've been in this industry for years. What else could there be to learn?
– We're already in permanent contact with distributors. We communicate with them every day.

– We know what customers want: lower prices. The best research for us to do would be about how to lower costs.
– We have ISO 9001. This guarantees that we're listening to customers and improving things that customers want us to improve.

This chapter discusses the reasons why a company should conduct ongoing industrial market research.

Someone experienced in industrial market research programs knows that the success of discovering and implementing an idea that benefits customers depends on two things: advanced concepts and a good experimental design (similar to scientists). The preface and first three chapters of this volume were focused on analyzing and discussing industrial marketing concepts. This was done on purpose. By organizing chapters in this way, the book has prepared the reader for a deeper understanding of market research. After all, Christopher Columbus, Charles Darwin, or Yuri Gagarin spent months—even years—preparing for their own exploratory expeditions.

What Not to Do During Industrial Market Research

A progressive industrial company researches its market on an *ongoing basis*; this allows them to understand their market and design new ways to benefit customers.

Fortunately, ongoing market research is less about being intuitive than it is about being methodical and persistent. What are some common mistakes that are made during a poorly designed market research program?

– A company regards market research as a 'sporadic activity' that gets them the information they need to make decisions. For example, hiring a survey company, hosting a focus group, or holding a lunch meeting in order to 'find out how customers are doing'. Worse still, since these activities only occur every so often, they tend to be carried out poorly.
– Confuse *customer behavior* with customer *purchasing behavior*. Based on the principles discussed in Chap. 2, it's easy to see how a supplier can get fixated on customer purchasing behavior: in effect, a company can use its market research findings to make short-term, profitable decisions (be these from month to month, or trimester to trimester). A customer company's purchasing behavior is merely an adjunct to customer behavior as a whole. Customer *purchasing behavior* and *customer behavior* are two things that deserve to be studied separately.
– A poor understanding of who the target customer is. Industrial companies are fixated on their direct customer (the one that pays the invoices), and as a result, companies tend to confine their research to this particular link in the industrial chain. A direct customer may be a distributor, an integrator, an assembler, etc. Moreover, companies often segment their direct customers based on purchase volume and spend more energy analyzing higher-volume customers.
– Misguided market research techniques. There are many consumer marketing techniques that are (tritely) put to use within an industrial context. This is an

extreme form of oversimplification and, in practice, it means that a lot of industrial suppliers use surveys, interviews, focus groups, etc. One of the worst things about this is its thematic content. The supplier is the one who comes up with the questions used in a survey, an interview, or a focus group. As such, the research is biased from the beginning, and consequently, its results are biased as well.

As thou shall ask, thou shall be answered. Unfortunately, the most common research technique used by industrial companies is surveys; this could be because they're low-cost or because they provide statistical results. Surveys are a confirmatory tool that can be useful for fragmented markets. Aside from companies that know little to nothing about their market, surveys should never be used as a company's sole *exploratory* tool. What's more, written word is hardly the strong suit of most business professionals. One misplaced word can undermine the whole purpose of a question.

In this respect, a face-to-face interview has the added virtue that it's possible to iterate with an interviewee if, by chance, there is something the interviewee doesn't understand. Yet, an interview in and of itself, conducted by a single person, presents its own risk for a research program. Even when a researcher has been careful about choosing their customer sample, and even when topics have been prepared intelligently and meticulously, there's still an element of risk: the one posed by the interviewee themselves. Whether the customer chosen to do an interview is articulate enough has to do with their ability to express what they believe or think in words. Not everyone has the ability to express their thoughts precisely, at least, not on every topic. Additionally, not every customer that's interviewed will be fully aware of the problems their business has (in this case, 'awareness' refers to the level of knowledge and experience a customer has with the operations that use the product or service in question).

As one might guess, a focus group suffers from the same sort of problems as the ones listed above. Not to mention, customers that participate in a focus group are removed from their workplaces and are made to sit down in front of people with different types of personalities and experiences. The environment of a focus group couldn't be more different from the environment in which a product is used. Focus groups—with their many methods for conducting psychological research—are generally inappropriate for researching industrial customers' needs. As opposed to consumer products (that are promoted by appealing to an end-consumer's psyche), a technical product/service has to resolve any technical/functional gaps in precisely the place where a customer puts it to use. When it comes to bridging these gaps, the type of psychological analysis proffered by focus groups is completely unnecessary.

It's important to remember that all of these techniques rely on an interviewee's human memory. Every time a customer answers a question, they'll search their brain for whatever memories they've formed from experience. What they'll find are the most immediate or distinctive memories, ones that could be biased or that might not be indicative of what the real opportunities are.

When these techniques are used negligently, they can have bad consequences. The worst of these is the 'listening to the customer' paradigm. This cliché has been repeated so many times among academics and executives that today, people use market research techniques for precisely this purpose: listening to customers. Few people seem to realize that when a customer talks about a problem, it's because that problem is noticeable and has been identified. Nothing will keep that customer from saying the same thing to other supply companies. A modern approach to industrial market research has to dig deeper, and go beyond whatever things have already been identified by the customer. It has to reveal, discover, and analyze those things that have yet to become visible.

The Concept Behind Ongoing Market Exploration

Industrial companies that think market exploration is 'costly' or 'disabling' (e.g. "because it keeps employees away from their work stations") are probably companies with a *sales culture* (second level of consciousness in Fig. 4.1). However, companies that are evolving towards a *marketing culture* understand that ongoing market exploration can be a strategic asset.

In the same way that other organizational activities are ongoing (e.g. accounting), market exploration should be too. It should be part of the very definition of doing business, and it should be part of an organization's day-to-day work. This is *the one* and only path to decommoditization, and it's the most promising horizon for companies that want to make history and create progress through their products or services.

Of course, ongoing exploration isn't free, and it may take years of work before a company is able to produce results that benefit itself and its customers. Identifying a problem in an industrial application, understanding it, and converting it into design specifications, can easily take 6 months. Developing or improving a product can take a couple of years. Then, 5–10 years might pass from the time a product is introduced into the market to when it matures. These are approximate numbers, and, no doubt, the reader will be aware that some successes occur more quickly, while others take more time. Nevertheless, companies that persevere at conducting ongoing market exploration know that once research begins to yield results, these results create a continuum of success stories that persists over time. See Fig. 4.4.

From the time an idea is formed to when a new product generates its first sales is a period of constant peril. Countless things can happen between initial market research activities and the success of a product: a company can have a sales anxiety attack, go through an economic recession, experience sudden changes to management, etc. Many companies that experience these changes either suspend or simply abandon their research and development programs. These companies haven't instilled ongoing market research into their organizational culture.

The Race Against Imitators

Industrial marketing is an essential part of winning the race against unscrupulous imitation by competitors. First, however, it's important to remember that this is just a race. There are no antibodies or antidotes that can protect a company from unscrupulous imitation.

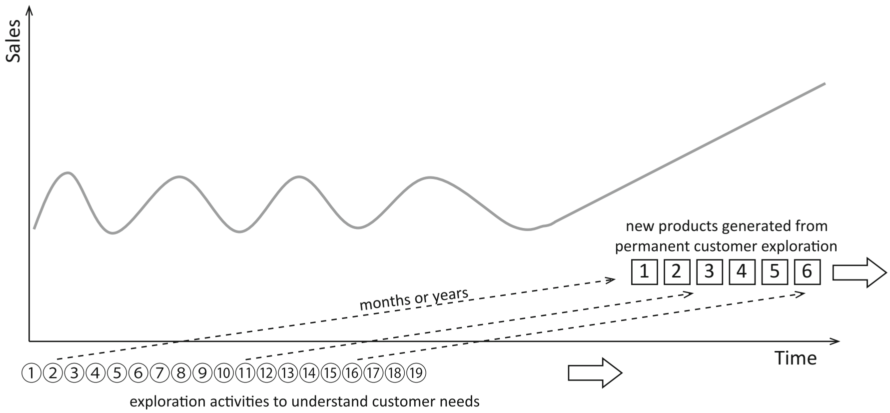

Fig. 4.4 This schema is based around the sales history of a company that habitually conducted market exploration (*circles*). It shows the trade-off between a continuum of successful new products (*squares*), and the time it takes to launch the first successful product (*dotted line* between exploration activities and successful new products). As long as the company understood and continued to conduct market research over time, the success of one product was followed by the success of another. Or, in other words, after an initial 'dry spell' the company experienced a season of ongoing returns

There are certain things that a company can do that will help it win this race, or even delay an imitation product from making its way onto the market. These things, or tasks, are specific and relevant to each of the three main industrial marketing programs (that is, market research, support for product development, and new product introduction). This is shown in Fig. 4.5.

An *ongoing* market research program means that a company studies product applications and comes up with new ideas on an *ongoing basis*. The key here is to work where competitors rarely do: the field, the very place where a product is being used. As will be discussed further in this chapter and the following one (on industrial market segmentation), a company that studies its product's target applications will consistently be able to adapt and specialize its product. The Discovery Team program described in detail below involves translating a product's functionality and attributes into precise statements and metric terms. These metrics function as a common language between a company's various departments, which makes the whole process of developing and introducing new products faster and more straight-forward.

A product development program must receive close support from a company's industrial marketing department. The product development program can further protect a company against imitators by designing its own manufacturing protocols, or some of the key machines needed for manufacturing a product. The internal structure of the development team is hugely important (see Chap. 6) for coordinating several activities at once, and it ensures that the new product introduction program gets off to an early start. When developing a new product, it's crucial to work closely with key suppliers and make sure that for a given period of time, these suppliers are providing the company with technological exclusivity.

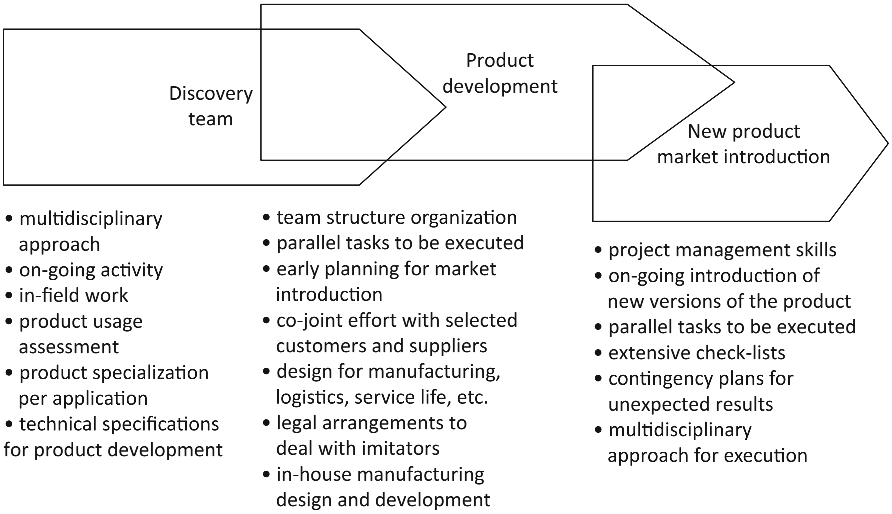

Fig. 4.5 The three main programs in modern-day industrial marketing. Each of these programs has certain characteristics that, at least early on, forestall imitation by unscrupulous competitors. These characteristics have two clear objectives: they buy a company time, and they allow a company to introduce progressively superior products

Likewise, a product's market introduction program further helps a company in its race against the clock. The main advantage of an introduction program is that it establishes a methodical protocol (see Chap. 12). Companies should plan their new product introduction program ahead of time, and consider any possible threats to its implementation. By designing and financing thorough contingency activities that protect a company from those threats, a company can delay an imitation product from entering the market.

Identifying Industrial Customers' Needs

Over the past few years, the issue of exploring, identifying and understanding customers' needs has provoked a considerable amount of controversy. All of the different assessment methods that have been proposed use different vocabulary, research techniques, documentation and analysis methods, etc. The majority of these methods—if not all—assume that so long as a supplier can resolve any problem that has been clearly stated by the customer, the supplier will be more successful. Yet, as Fig. 4.6 shows, solving a customer's expressed needs doesn't necessarily mean that the customer will be more interested in buying a product.

There are many reasons for this phenomenon: product development based off of feedback from customers that don't fully understand their business problem, failure to quantify a problem's impact and/or quantify a solution's impact, focusing one's analysis on the wrong customer (e.g. an intermediary who has other interests), etc.

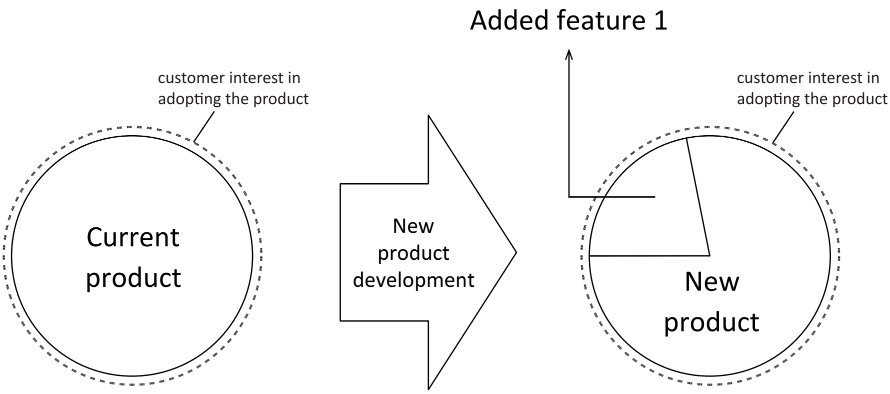

Fig. 4.6 A newly developed product that includes improvement 1 doesn't increase customer interest (customer interest is represented by the *dotted line*)

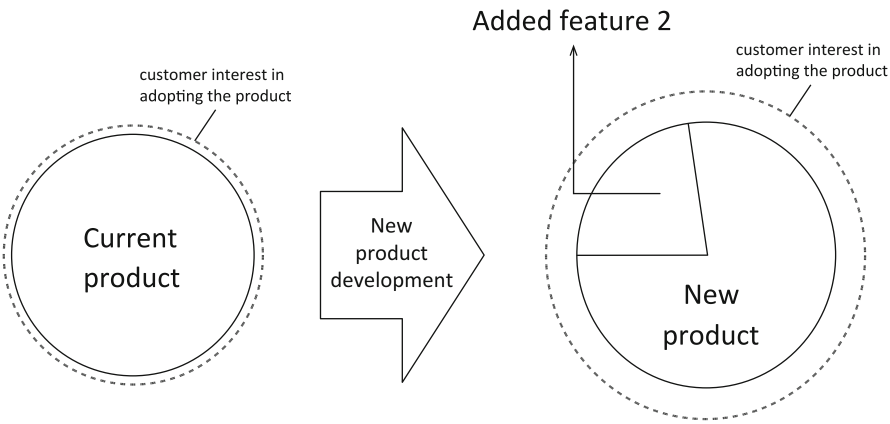

Fig. 4.7 A newly developed product that includes improvement 2 significantly increases customer interest (customer interest is represented by the *dotted line*)

On the other hand, Fig. 4.7 shows how a new product—one that resolves problems stated by customers and incorporates real improvements—can increase a customer's interest in buying and using a product.

How does a company get the information to develop a new product with improvement 2, as opposed to improvement 1?

First of all, it's best not to make intuitive decisions about a customer's potential interest in the solution to a particular problem.

Industrial customer's employees are immersed in their own work environment, projects and problems, and it's often difficult for a supplier to visualize this. The supplier's product is also immersed in this setting, and is often at the very back of customers' minds. A similar thing happens to the product itself. When a supplier visits a customer, the customer is forced to think about the product in question. If the product is neither strategic nor critical for the customer company, then the customer will have to do a 'mental search' in order to remember which product it is, its significance and its scope. It's incredibly important for a company to understand that within the work environment at a customer company, their product/service has *relative importance*. Unfortunately, far too many suppliers think their product is at the center of the universe.

Secondly, in order to explore customer needs and find real opportunities for future improvements, suppliers should ascertain (and, if possible, *document*) whether or not a solution to a customer's problem will produce relevant, quantifiable benefits. Eventually, a company will be able to express these quantifiable benefits in financial terms.

This last point is key for avoiding the type of mistake shown in Fig. 4.6. Economic benefits are a good guide as to whether a customer will be interested in a new product. Expected economic benefit to customers is one of three types of metrics that are essential to industrial market exploration.

The economic benefits metric (EBM) can also help a marketing strategist resolve another type of problem that's common to complex market findings: that of prioritizing different design improvements for a given product. This is shown in Fig. 4.8.

A proposed product improvement might only create marginal benefits for a target application, and it might slow down and raise the cost of product development. A manufacturer can postpone making this particular improvement and can include it in subsequent versions of the new product.

As such, the EBM allows a company to prioritize product improvements that have a substantial impact on a customer's business.

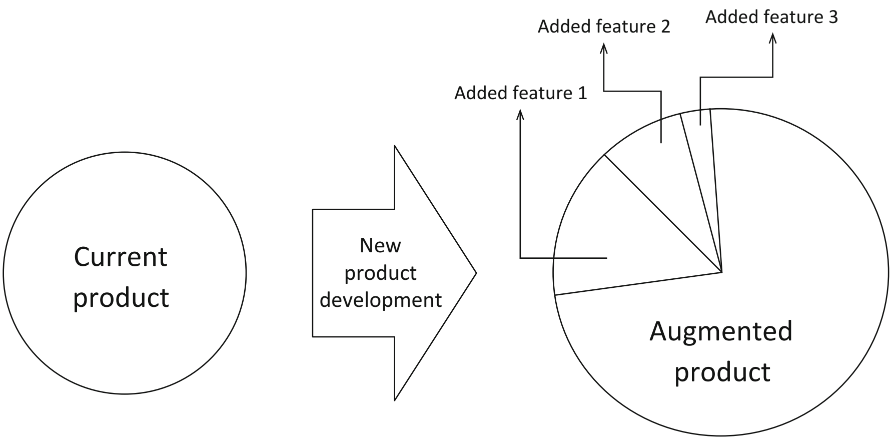

Fig. 4.8 Once a market researcher has identified (truly compelling) product improvements for a given application, they'll have to prioritize the relative importance of each one. It's likely that one of these improvements is only marginally beneficial compared to the other ones. So, assuming one of these improvements is costly or time-consuming, a company doesn't have to include it in the initial design and production of a new product

The Industrial Market Research Process: Getting the Big Picture

No matter what kind of research techniques or methods it uses, industrial market exploration needs to analyze any and all key variables. The schema proposed in Fig. 4.9 shows the basic elements that go into comprehensive industrial market research.

Generally speaking, the research process consists of six fundamental stages: the product idea, organizing customers' needs according to application, product usage environment, market trends, metrics, and knowledge of competing or substitute products (of how well they perform).

Customer Needs and Ideas for Solutions

This consists of identifying a customer need and expressing it as a potential benefits statement. In turn, these benefits can be expressed in terms of product functionalities or attributes.

However, it's important to point out that customer needs originate with a customer problem, a challenge, or a performance gap. As a problem begins to intensify, it sets a process in motion that ultimately leads to a declaration of customer need. This is shown in Fig. 4.10.

In order for there to be a business need, a business problem has to exist and has to become evident at some point. An organization may or may not be aware of this internal problem, and even if they are, that doesn't mean that they fully understand or appreciate its magnitude. Most of the time, organizations only become aware of a problem after its effects become apparent (e.g. quality issues, performance gaps, work-related accidents, environmental damage, etc.).

Yet, it's often the case that it's not entirely clear what the effects of a problem are, and while they may be restrictive or harmful, a company can coexist with them and be none the wiser. Companies can learn about these hidden problems by engaging intellectually with customers and suppliers, or by using new cutting-edge technology capable of revealing unknown problems. For a supplier, this is further proof that the typical 'listening' to the customer interview (which assumes that the customer is fully aware of their own limitations) isn't a good setting for learning about hidden problems, much less customer needs.

In order for a supplier to understand these unspoken needs, they first need to understand their customer's business operations. Additionally, they should use a market research method that allows them to discover existing problems that have yet to be noticed by customers. Then, the explorer supplier should distance itself from the psychological inertia generated by its own product offering; this psychological inertia is a dangerous one. It hinders the supplier from understanding the customer problem in all completeness.

Industrial customers' needs can vary in nature. They can be classified according to how operationally critical they are, or by how big of an impact they have on a customer's product. This is shown in the schema in Fig. 4.11. Generally, in an

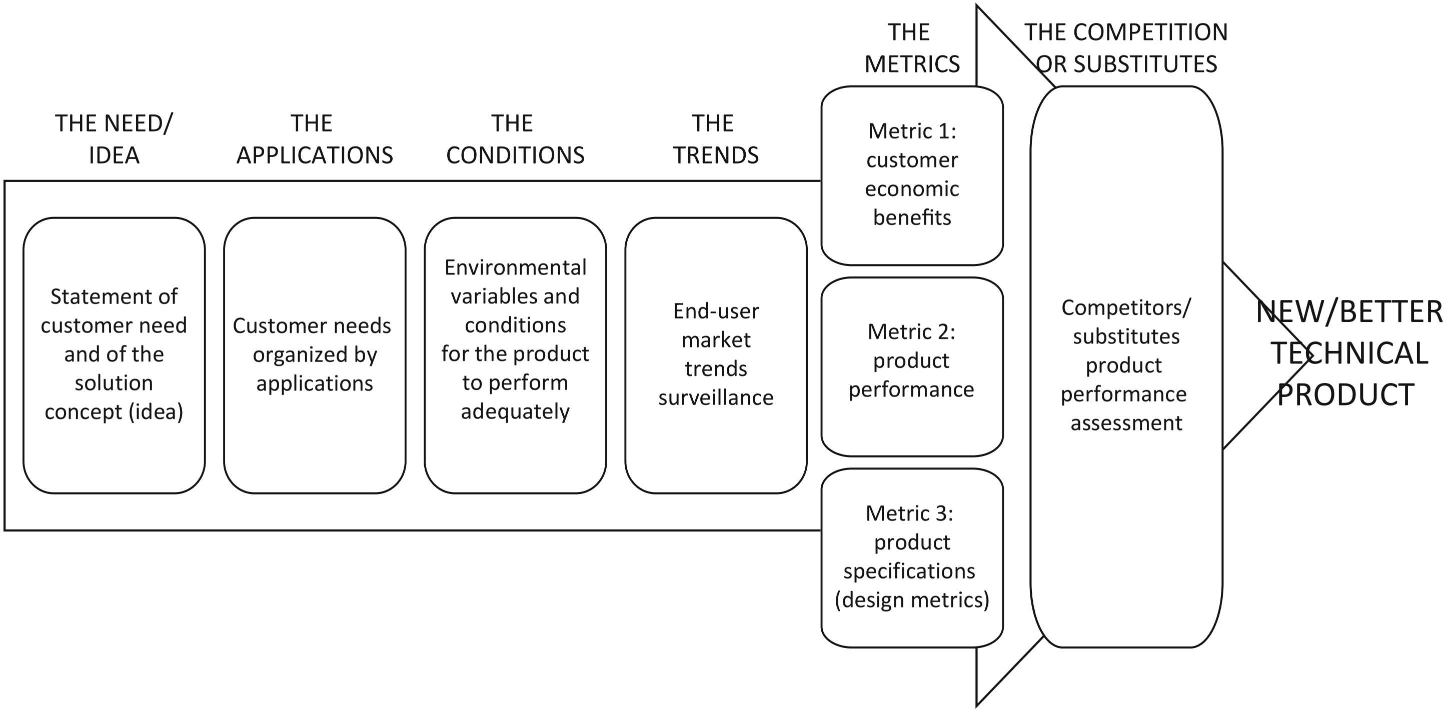

Fig. 4.9 The overall process and the basic elements of a comprehensive industrial market research program. It consists of six fundamental stages: identifying a possible solution (a customer need), organizing needs according to application, usage conditions, analyzing market trends in the downstream industrial chain, customer benefit metrics, and comparing a product's performance to that of current competing or substitute products

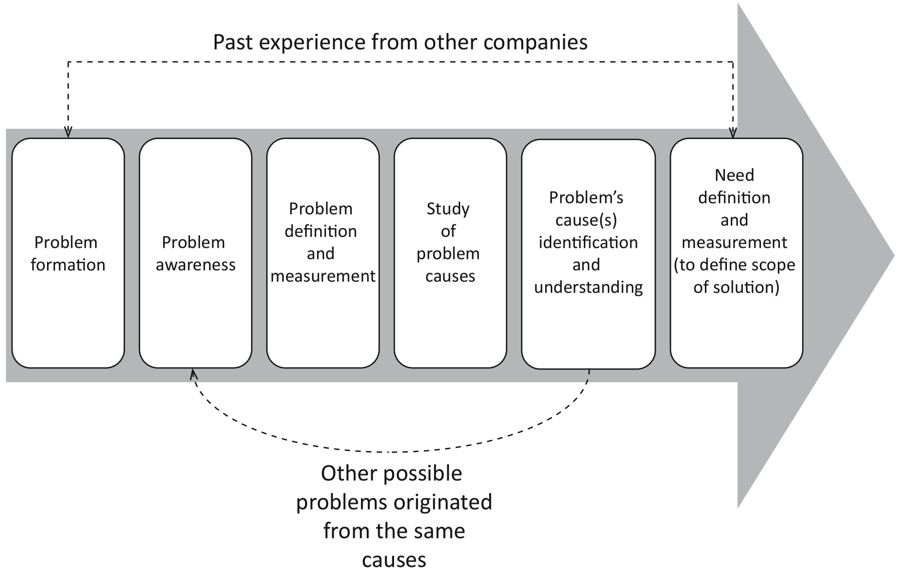

Fig. 4.10 Schema showing the initial stages before a market need is formed. Even as a problem begins to gestate, an organization might not be aware of it unless the problem has obvious repercussions (e.g. work-related accidents, product quality complaints, environmental pollution, etc.). Conversely, a serious problem can often go unnoticed for long periods of time. Market research techniques that focus on 'listening' to the customer are usually unable to detect these problems and needs

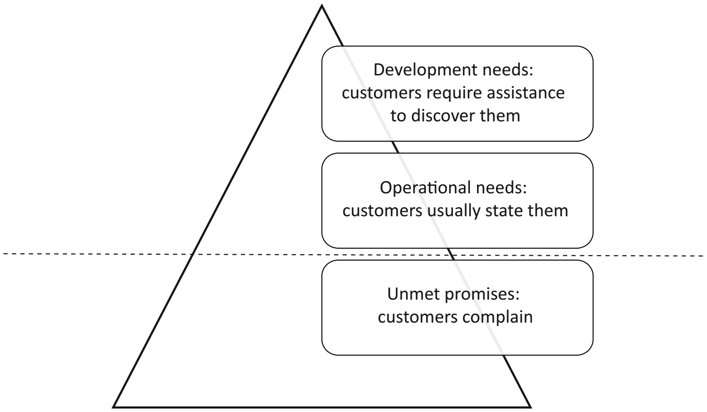

Fig. 4.11 Three levels of industrial customer (dis)satisfaction. The *dotted line* separates the base level from the rest of the pyramid. This base level is where customer dissatisfaction occurs (this results from suppliers failing to meet their promises). The two other levels of need (described in the text) are located above the base level

industrial context, the ongoing iterations between supplier and customer make it possible to discuss both a need and its solution at the same time. That is, when suppliers study a particular market application, they're likely to come up with one or more product concepts (see Chap. 6) early on.

Operational Needs

These are needs that have to do with a customer's operations. When these needs are resolved, the benefits are felt mostly within the customer's business. Generally speaking, these are the needs that customers are most likely to express, and they can be divided into two subgroups:

- *Continuity needs*: these are satisfied through critical supplies that provide operational continuity to a business (hence the name). When these supplies are missing or fail to work, then this puts a customer's production lines or administration at risk. Not surprisingly, these are the type of needs that customers are most vocal about with suppliers. Continuity needs are satisfied by critical supplies such as: the availability of good power supply, maintenance services for equipment, structures, and systems, the service life of production equipment, and the overall performance of replacement parts.
- *Improvement needs*: as the name suggests, this type of need is satisfied by supplies (these can be products or services) that are not critical, but that provide benefits for the customer such as lower costs, increased productivity, improved safety, etc.

Development Needs

These are needs that affect a customer's offering to its own customers (meaning that the benefits are passed down through the industrial chain). Customers are not always aware of these kinds of needs. Examples of these needs include:

- Technologies that improve the functionality/attributes of a *customer*'*s* product
- Materials or components that improve the functionality/attributes of a *customer*'*s* product
- Technologies or components that lower the cost of a *customer*'*s* product

Underlying these two types of needs (operational and development needs) are needs that haven't been satisfied. This occurs when suppliers fail to meet their promises (in Fig. 4.11, this is represented as the base of the pyramid). This could refer to either type of promise (continuity or development), but, regardless, these unsatisfied needs share one thing in common: some type of breakdown has occurred and the supplier is the one responsible.

There are different ways for suppliers to find out about each of these three types of needs. Unkept promises are generally received as customer 'complaints'. Large-volume customers tend to air their complaints loudly—if not thunderously. In practice, there are various ways to find out about complaints: surveys, noncompliances (with ISO 9001 regulations), information provided by the sales force, or through some formal complaint system.

To get a customer's perspective on what their *continuity needs* are, suppliers can use visits or customer interviews, information provided by the sales force, as well as other traditional methods of market research. Customers will be fully aware of these types of needs, and will have no problem stating them to their suppliers. When a customer is vocal with a supplier about their continuity needs, the supplier shouldn't necessarily take this as a complaint. Unkept promises aren't really at issue here. What is at issue are technological limitations inherent to the supplier's industry, and that the customer is fully aware of. Yet, as mentioned earlier, these 'commonplace' limitations put a customer's entire operational continuity at risk. Customers will be concerned about these limitations and it's their job to become familiar with them and discuss them with their suppliers.

There aren't as many tools that suppliers can use to find out about *development needs*. Remember that, under the 'listening to the customer' paradigm, a supplier is limited to learning about needs that a customer has already identified (and, by the same token, is able to share with all other suppliers). Thus, in order to learn about customers' development needs, a supplier needs to use research methods that are less common, and that differ from the ones described above. In the interest of learning about customers' development needs, this chapter proposes a methodology called the Discovery Team.

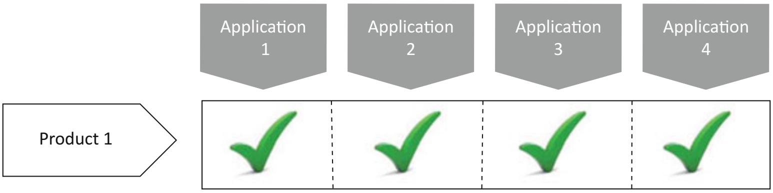

Fig. 4.12 Market exploration can reveal the need for new functionalities or attributes. Simplified market exploration is when a single idea applies to a wide range of different applications

Organizing Different Customer Needs According to Their Different Applications

The level of difficulty that goes into exploring and identifying industrial customers' needs ranges from the evident to the very complex. Something that's evident is not necessarily simple. And, as stated earlier in this chapter, when a company makes significant discoveries in industrial markets, they'll inevitably have to make changes to their product's design, how it's integrated/delivered, and the follow-up on product use.

An example of simplified market exploration is when customers all share a significant need that will impact upon several different applications. (However, in this author's opinion, it's very rare for a given product application to have a single evident need. As noted above and depicted in Fig. 4.10, a supplier that is conducting market exploration should always be aware that a customer may not fully understand their own problem). This type of simplified market exploration can have a wide range of market applications. This is shown in Fig. 4.12.

In a more complex case, a supplier might identify several different needs, each belonging to a different customer. Here, the supplier should carefully evaluate whether these needs should be 'packaged' together into a newly designed offering, or if these ideas are only specific to certain types of applications. In the first instance, this could mean creating a 'super product', one that is difficult to develop, is more costly for customers, is hard to produce and exceeds requirements for certain applications. In the second, a supplier might develop several products, each one specific to a different application. This is shown in Fig. 4.13.

Environmental Conditions and Product Performance

These are the variables and conditions that a new product will encounter, and they should be researched before designing a product's characteristics in detail. For instance, a new product might be installed in an environment with extreme temperature and humidity conditions. If a market researcher fails to investigate and document these conditions, then they run the risk of creating a product prototype that performs well in a laboratory setting, but fails during field testing.

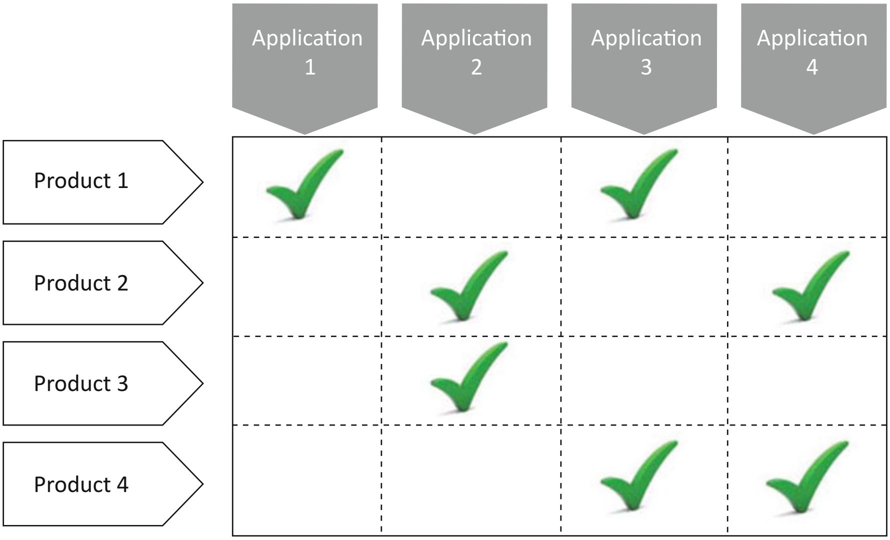

Fig. 4.13 Market exploration can reveal needs for new functionalities or attributes. Complex market exploration is when multiple ideas surface from visits with clients, and these ideas have divergent applications

Metrics for Customer Needs

These metrics indicate the level of product/service performance required for a given application; they're expressed in numbers (which is to say, they're quantified). There are three types of metrics that a market researcher should report on. The *economic benefits to the customer metric (EBM)* identifies any savings or economic gains that a customer can expect to receive by buying and using the new product. The *product performance metric (PPM)* describes the needed performance for a product's functionalities or attributes. The *product design metric (PDM)* is key for determining a product's physical specifications, which, in turn, are used as a guide for designing and manufacturing a product. This last metric is commonly used by research and development departments. Details and examples of each of these three types of metric will be provided later on in this chapter.

The Industrial Chain and Downstream Market Trends

An industrial marketer should be alert to opportunities—and threats—in the downstream industrial market. Not only can new trends appear in a user's industry, rather, they can also appear in a market that the user is dependent on. Oftentimes, the trends that affect industrial chains take place at the end-user or at the ultimate-user level. One example of this is car engine carburetors. In the 1980s, car carburetors began to go obsolete and this was tantamount to a death sentence for numerous other, associated products. The reader can imagine what would happen to hundreds—or even thousands—of suppliers if gasoline engines were to suddenly go obsolete.

Threats to the demand for a given technology can also appear when the problem it attempts to solve is addressed by other technologies unrelated to the supplier's industry. For example, noise engineering can reduce the noise at a plant facility so that hearing protectors are no longer needed. This is a kind of obsolescence that is driven by parallel or indirect substitution.

An industrial market researcher should be mindful of these market *trends*. Out of all the industrial market research activities that a company performs, this type of analysis is arguably the most intuitive. Yet, for all the subjectivity that goes into analyzing market trends, it's absolutely necessary that the job get done. Here, it's best to err on the side of caution (and sound the alarm bells early), than it is to be accused of negligence.

The Substitute, or Competitors on the Prowl

In market exploration, it's incredibly limiting to assume that the *functionality* a customer receives from a certain kind of product can only be derived from that type of product. Suppliers who suffer from this type of 'marketing myopia' and go on to conduct market exploration are only capable of associating customers' needs with their own product—as if theirs were the only product that could fulfill those needs. The customer company, however, may have a much broader vision of all the technologies that could be useful to them.

There's a revealing story behind most substitute industrial products. Substitute products generally begin by making their way into specific and relatively minor applications; and for the first few years, they generally get by unnoticed. History has shown that suppliers of these products tend to be skilled at improving and redesigning their wares. By the time the original supplier has realized what's going on, it's already too late: there's no stopping substitutes from entirely taking over certain market applications.

The electrical cables industry has suffered from this type of marketing myopia; specifically, with regards to the use of electrical cables in tall buildings. The electrical cable is an established product concept, and it has several industrial applications in any economy. The concept behind electrical cable design hasn't undergone any significant changes in decades. Towards the end of the twentieth century, cable manufacturers began to hear about busbars (as a possible substitute). Yet, given how complex and costly these were to make, cable manufacturers didn't pay attention to the reasons why this type of technology was needed. Within just a few short years, customer engineers were calling for the use of busbars in various types of tall buildings; busbar design was becoming increasingly convenient, and they were less and less costly.

This goes to show how dangerous it can be for the original suppliers to become complacent. A manufacturer that makes statements like, "these substitutes have x, y, z disadvantages" or "they're too expensive to be able to compete," may be shooting themselves in the foot.

One way to avoid this is to explore a product's various market applications and analyze customers' needs comprehensively. An industrial marketer should be aware that industrial customers aren't after the 'device' itself. They need the *functionality* that these products provide.

Additionally, the supplier conducting research should find out how well an equivalent and competing product performs. Many suppliers neglect to do a proper side-by-side comparison. This is a mistake since an industrial customer will routinely make this kind of comparison.

Ideally, a supplier conducting market research should use the concept of functionality and the six types of product attributes (discussed in previous chapters) to metrically compare their product's performance. At the very least, this comparison should include the economic benefits metric and the product performance metric (discussed below).

The Discovery Team: A Multidisciplinary Method for Exploring Industrial Markets

This book proposes using a Discovery Team (or DT) as a tool and method for conducting ongoing industrial market research.

A DT is defined by these four points:

1. It's an *exploration* team that looks for *revolutionary ideas* that can *benefit customers* through new and improved products/services.
2. It's a team of people that conduct research *in the field*.
3. It's a *multidisciplinary* team (technical, commercial, logistical, external, etc.).
4. It's made up of people who demonstrate exceptional *critical and/or creative thinking skills*.

The first point encompasses three concepts that are central to the business principles expressed in this book. To begin with, the idea of 'exploration' has more practical connotations than the idea of 'research' (nonetheless, some of the methods described in this book are similar to scientific research methods). Here, the idea is that 'exploring' implies going out into an unknown (and perhaps difficult) field, whereas, in business jargon, 'researching' offen implies using statistical techniques to analyze large data sets.

The first point also encompasses the concept of a *revolutionary idea*. Companies should take this as a genuine and motivating goal. A revolutionary discovery might consist of an incremental improvement to a product, the creation of a new category, and the inclusion of new functionalities or attributes. Because of this revolutionary idea, a product that is currently used for an application becomes obsolete.

Should a DT attempt to be revolutionary? This is both the spirit and the challenge. The purpose of a DT isn't to confirm the typical assumptions that are made by an organization with a commodity culture: things like, "we have to lower prices," “we have to comply with technical standards and regulations,” etc. Nor should it acquiesce to finding out generic information and bringing it to the attention of company members—information that, moreover, can be acquired through other, less sophisticated research techniques (e.g. “we have to improve delivery times”).

The first point encompasses a third concept: *benefiting customers*. This goes against the commonly held goal of conducting market research in order to gain a competitive edge and create more revenue for a company. Exploration can’t be done properly if researchers don’t have the right mindset. People who go out into the field attempting to procure personal benefits end up focusing on short-term ideas that are meant to boost sales (sales culture). People who go out into the field with the aim of benefiting some other entity (e.g. customers) will generate more complex ideas that require more time and effort to develop.

The first point deals with one last concept, one that concerns the most important benefits that a customer (end-user) receives: the benefits they get from the supplier’s technology itself. To better understand this idea, the reader can refer back to Chap. 2 and review the concept of COP (Customer Orientation Through the Product). Naturally, given that the product plays a central and significant role in this type of market exploration, a DT will spend their most valuable time exploring *product use*. This will be discussed in more detail below.

While the second point may seem obvious, it does deserve some consideration. Chapter 1 discussed the limitations of an organizational culture that favors officism. Officism is the customer’s enemy since it hardly ever leads to ideas that benefit them. In fact, it hardly ever leads to any good ideas whatsoever. This point should be duly stressed: companies that manage to rebel against their own corporate autism will be able to develop programs for ongoing market exploration. It’s a matter of habits, and changing habits requires a great deal of leadership and energy. The concept of ‘fieldwork’ is far more nuanced and complex than many experienced executives believe. Fieldwork not only provides answers, but some of the best questions.

The third point captures the very essence of a DT. In order to understand customers’ problems, a DT has to use multidisciplinary thinking. A group of people from different educational and experiential backgrounds can work together to come up with complementary analyses and ideas; this broadens and adds depth to discussions about possible solutions to a problem. While customers’ problems are becoming increasingly complex, so too are the solutions to those problems (whether they’re products or services). As a result, a DT wouldn’t be complete without *technical professionals* (R&D, engineering, etc.) who are directly involved in conceptualizing a product, and developing and manufacturing it (see Chap. 6). A DT requires complementary scientific knowledge in order to come up with a solution to a customer’s problem. This might consist of fundamental sciences (chemistry, physics, biology, etc.) or engineering (metallurgy, electronics, robotics, etc.).

At the same time, one of the perks of a multidisciplinary team is that colleagues from different company departments work together (these departments aren’t always on good terms with one another). This way, for instance, technical personnel accustomed to working in laboratories and offices will do their own field research (sans messengers) about problems in different applications.

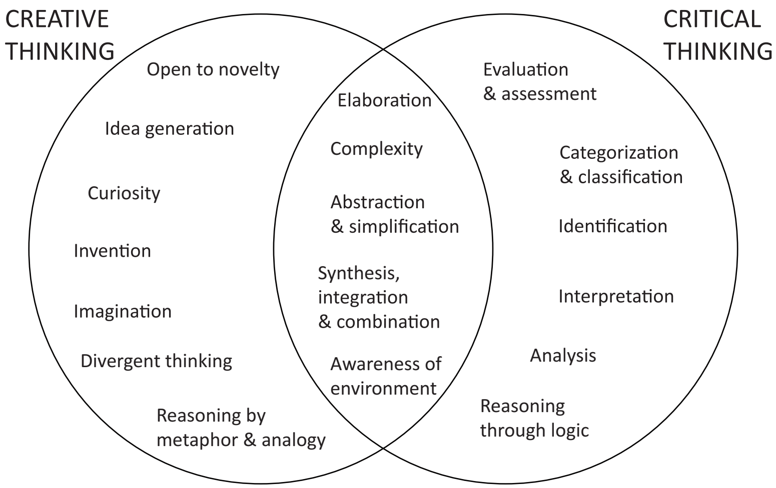

Fig. 4.14 Two types of personality traits that are required in order to join a Discovery Team. Creative thinking is divergent, whereas critical thinking is convergent; while creative thinking tries to create something new, critical thinking scrutinizes something that already exists; while creative thinking breaks with established principles, critical thinking operates along accepted principles. Source: Creative and Critical Thinking: Assessing the Foundation of a Liberal Arts Education. The Five Colleges of Ohio. www3.wooster.edu/teagle/vendiagram.php. (Practical Strategies for the Teaching of Thinking. Beyer, B.K.Boston: Allyn & Bacon. 1987.)

Traditionally, the people that have served as messengers between a company and the real-life application of a product have been people that have worked in sales (e.g. sales force); people who—as far as a competent product development department is concerned—might have lacked the credibility necessary to realize ideas. In order to achieve the goals outlined above, the people on the new product development and introduction teams have to be on good terms with one another.

The fourth point alludes to the selective nature of a Discovery Team (admittedly, this could generate some controversy). Not just anyone that wants to can join. A company that's committed to doing its best for customers has to have to have an acute understanding of a customer's problem and be able to generate solutions that are up to par. At times, these solutions may turn out to be revolutionary and/or ground-breaking with regards to the prevailing technology. As such, DT members have to be well-prepared, and they have to be talented critical and creative thinkers. Figure 4.14 shows the similarities and differences between these two types of thinking. This should be referred back to when choosing DT members.

Companies tend to be aware of which employees possess these attributes. These employees don't necessarily belong to any particular hierarchical level within the company. These members may come from any department; although, it's important to reiterate that a DT must include technical personnel that are knowledgeable about the product or application in question.

What a Discovery Team Is Not

– *It's not a sales team*. When conducting field exploration, a DT should avoid selling products or services at all costs (even if it's something the customer wants to discuss). A DT should be strictly removed from any type of commercial activities; this ensures its integrity in the eyes of the customer. Given the above (and because a sales representative is likely to be present during the field visit), the DT should review these rules before getting started.
– *It's not supposed to solve customers' immediate problems*. Immediate problems include logistics issues (delivery times, invoices, etc.), commercial issues (prices, credit and collections), or day-to-day things that have to do with production. This is not the DT's job. A DT that spends its time discussing immediate problems with a customer is missing the whole point of conducting a field visit. Furthermore, this gives the customer the wrong impression about what a DT is meant to do.
– *It's ideas are not generic or conventional*. A company doesn't need a Discovery Team in order to come up with generic and conventional ideas. If that's what a company is looking for, then they can just talk to the customer over the phone. For the most part, a company gets enough generic ideas just from customer complaints or noncompliances. A DT is a sophisticated research method and company members expect more from it; it cannot provide them with the type of standard opinions that get expressed in standard market jargon (e.g. "we have to lower prices," "we have to improve delivery times," "we have to comply with technical standards and regulations," etc.).

How to Manage a Discovery Team

Before going into detail on the organizational structure of a Discovery Team, it's important to discuss how this type of program should be managed.

This program has to be seen as a long-term project. And, like any project, it needs a leader—someone to ensure that the methodology is carried out thoroughly and consistently. This leader is also responsible for making sure activities are completed, solving bottleneck problems, ensuring the quality of work on a regular basis, and managing budget resources.

The person in charge of this program should be someone with decision-making power within the company's hierarchy. He/she should work together with other people in leadership positions to make sure that the program fulfills all of its commitments (this means that the DT has a matrix management structure).

Ideally then, the general manager should be the one in charge of the program. Barring this, the commercial manager should take charge, and make sure to work closely with the general manager.

In qualitative terms, a leader's most important job is to make sure company members expect great things from a DT and that the DT's work lives up to these expectations.

The Organizational Structure of a Discovery Team

The purpose of dividing up the team into different roles and responsibilities is to make sure that people don't stray from the method. Naturally, if a team only consists of a few people (3, 4, or 5 members), then it makes no sense for it to have a complex organizational structure. Doing so would only distract people from their primary responsibility: learn about customers' problems and develop revolutionary ideas for how to fix them. Below are descriptions of two roles: team leader and activity moderator.

– Team leader: any member of the DT with management experience can be the team leader. It's a good idea for team members to take turns assuming this role so that they'll be more appreciative of the challenges it involves. The leader is responsible for making sure the team is rigorously employing and following-up on the tools used in this method.
– Activity moderator: having a moderator present during field visits can make a customer feel more comfortable and it can make the entire visit more effective. The moderator plans visits, and oversees and moderates the interview and on-site observation (see below). He/she is in charge of starting off the interview, introducing each DT member, and maintaining the focus of the meeting. During the interview, the moderator maintains the pace of the discussion and keeps track of time. If necessary, it's their right to interrupt, cut-off or change the topic of conversation. The role of moderator can be filled by any member of a DT so long as they have a comprehensive understanding of the DT's objectives and procedures.
– Data collector: it's a good idea to assign someone to document detailed data discovered or collected during the visit. Otherwise, there's a risk that everyone in the Discovery Team will spend the visit with their heads down, taking notes, instead of paying attention to interviewee statements or thinking about interesting questions. Since being a data collector is never a popular role, DT members can take turns filling this position.

What Does a Discovery Team Do?

At the beginning of this chapter, it was established that an effective industrial market research method needs to make sure that significant variables or conditions are integrated into the future design of an offering. These variables can be found in the diagram in Fig. 4.9. The Discovery Team process, and the DT's various activities (represented in Fig. 4.15), are designed to analyze and document these variables and conditions. From now on, this process will be referred to as 'the Discovery Team road map'.

In a few words, the Discovery Team visits the chosen customer's facilities, conducts interviews with the appropriate personnel and does on-site observations (here, they can observe any problems with a product/service or any opportunities for

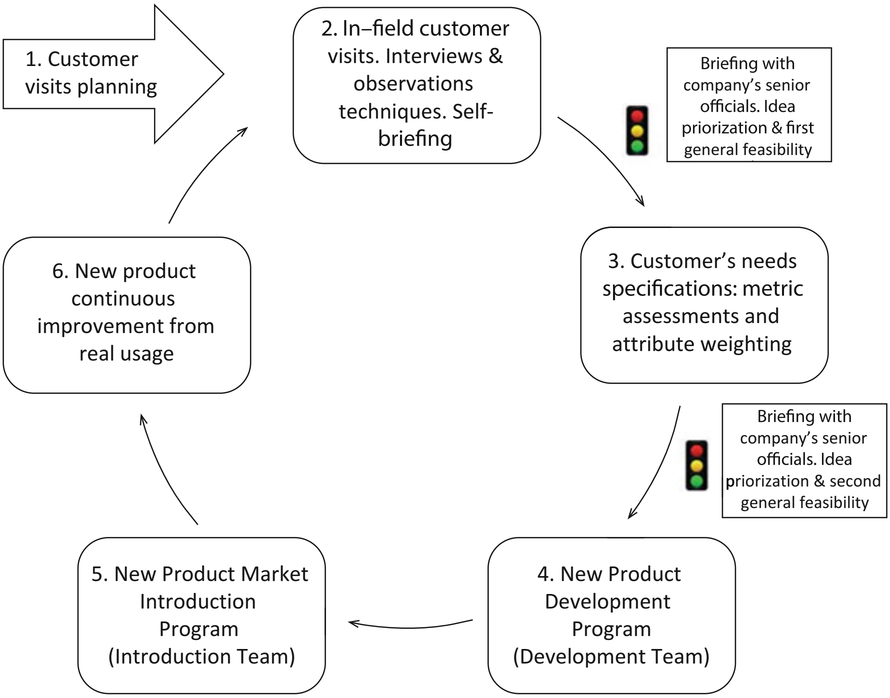

Fig. 4.15 The Discovery Team is an important tool used in strategic industrial marketing activities. The cycle shown here consists of 6 stages, all of which are meant to facilitate the ongoing development of an offering. This might consist of incremental improvements to a product, or it might consist of a radically new product. The Discovery Team is directly involved in four of these stages, and provides additional help during the product development stage and the new product introduction stage

improvement). For the most part, visits should use a hybrid method (combining interviews with on-site observation). The DT should use precise language and metrics to express their findings.

Once this information has been fully apprehended, it should be reported back to the organization. From there, an organization can assess whether or not these new opportunities merit investment, redesigning a product, or new product development.

As shown in Fig. 4.15, 'product/service development' and 'new product introduction' are headed by the R&D department and the industrial marketing department, respectively. The Discovery Team also contributes to these projects (and helps improve them) with feedback they get from the field.

Finally, the Discovery Team plays a major role in following-up on the new offering. They make sure the technology improves, and they provide their organization with information that's necessary for introducing new versions of a product.

Stage N°1 on the Discovery Team Road Map. Planning Visits

Whenever the Discovery Team visits a client, this visit has to be meticulously planned ahead of time. When planning visits, the following issues should be discussed:

– What do we hope to achieve on this visit? (What are our objectives?)
– Which customers should we visit?
– Who should the Discovery Team meet with at the customer's facilities?

Stating the Objectives of a Visit

Each time the Discovery Team goes to visit a customer, it should have a written statement of its objectives. Some of the first questions that a DT needs to ask itself have to do with the very purpose of the visit. While it may seem obvious, it's important that Discovery Team members arrive at a consensus about their objectives before attempting to outline them in detail. Generic answers such as "we want to know what our customers' needs are" are not sufficiently useful or conducive to anything. It's better to take the time to discuss and agree on a clear objective. Some examples of clear objectives are: do concept testing for our new product idea, identify the limitations of the technology currently being used by the client, determine the functionality needed, determine the (functionality) performance metrics that a customer expects from a new product, etc.

There are other types of questions that will help the Discovery Team organize itself internally. The team needs to be briefed on who's leading, who's moderating, or who's performing any other role that might be needed for a given visit. This is also a good time to review any mistakes that were made during previous visits so that they don't happen again.

DT members should also understand what their customer's business is and how it operates. It's a good idea to discuss these issues at length, and ask questions such as: what is this customer's business about? What is their business model? How are they positioned with their customers? What's the future going to be like for their business or industry? How are they evolving?, etc. A Discovery Team that has a clear understanding of these issues, will be able to ask more realistic and creative questions and discover better opportunities for benefiting the customer.

With this information, a Discovery Team can ask themselves (and respond to) the next question: is this the right customer for us to visit? Why?

Sometimes, suppliers decide which customers to visit based on who they've maintained a friendly relationship with (thus making it easier for the supplier to contact them, and easier for the customer to meet with the Discovery Team). However, just because a customer is friendly with a supplier doesn't mean that they're the best customer to visit, nor the best source of information and knowledge. A company should always make a point to visit whichever customer is the technological leader in their industry. This point will be discussed in greater detail below.

During the planning stage, it's good to keep in mind that different types of visits require meeting with different members of a customer's personnel. For instance, the first time a Discovery Team visits a customer, it might want to find out about technological opportunities in their customer's industry. To do this, they should probably meet with the general manager, the commercial manager, or the business development manager. On another visit, however, a Discovery Team might be more interested in meeting with a customer's operations officers or technical personnel.

Finally, a company should always be aware of how important their business and offering is for a customer. Suppliers frequently assume that their product is at the center of a customer's universe, which makes it hard for a visit to be realistic or creative. On the other hand, a supplier can also underestimate their product's potential impact on a customer's business. As discussed in Chap. 3 (which dealt with concepts behind technical products), a supplier's offering can impact on a customer's business in two ways: cost reduction (*solver* products), and/or improving the quality or function of a *customer's product* (*positioner* products). These concepts will help a Discovery Team identify new opportunities for their company's technology.

Out of All the Customers on the Industrial Chain, Which Ones Should a Company Visit?

The Discovery Team can visit any customer along the industrial chain. Nevertheless, it's a good idea to start off by visiting the *end-user*. Why? Because they're the type of customer that uses a product for the purposes for which it was designed. Some of the most profound and significant discoveries have been made based on how a product is used. An industrial marketer should never forget that *a product is bought in order to be used and benefited from.*

Much of what a company learns from visiting its end-users will help it make sense of ideas that come up later on, when it visits other companies along the industrial chain. Not surprisingly, a DT may come to the conclusion that the industrial chain, in its current state, is poorly designed.

The literature on business innovation proposes that all end-users have certain characteristics that help guide companies in developing radically new products.[1] The idea behind *lead users* is that certain companies are more advanced and have developed their markets far more than others. As a result, lead users' needs are far more demanding (above average for their industry). The Discovery Team method supports this idea. However, it also calls upon suppliers to visit not just their lead users, but users that have applied their technology *in unexpected ways*. Of course, the Discovery Team method only works so long as customers are open, available, and willing to share their knowledge and experience.

[1] Creating Breakthrough at 3M. Eric von Hippel, Stefan Thomke, Mary Sonnack. HBR, September-October 1999.

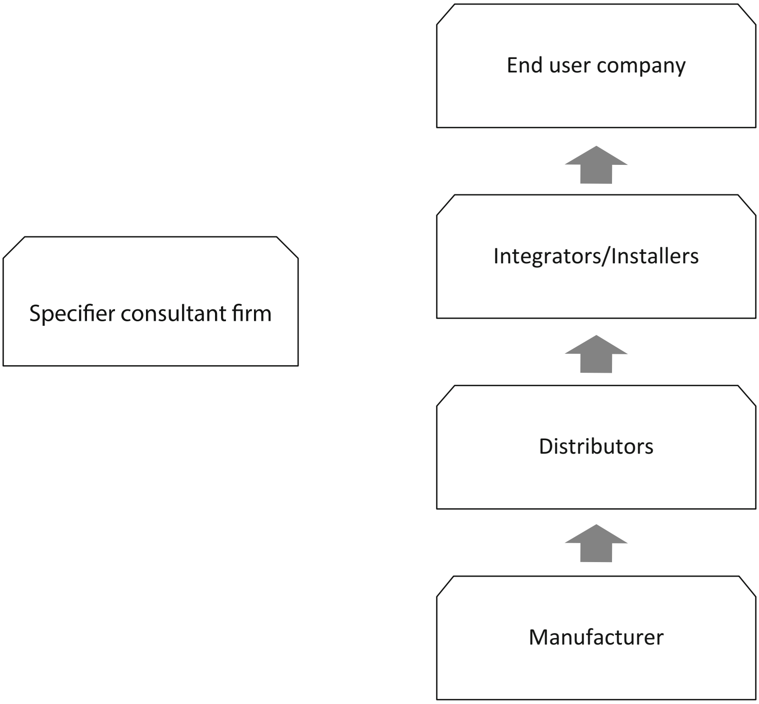

Fig. 4.16 In a standard industrial chain, the company conducting market exploration can be found at the bottom (in this case, the manufacturer) while the end-user is at the top. Shown here are the various business stages that a product goes through before arriving at the end-user. Parallel to this, there may be an engineering specifier (responsible for specifying a product's characteristics). As discussed previously in this book, an industrial chain can be far more complex than the one depicted here, or, it could also be far simpler

So, in order to figure out which customers to visit, a Discovery Team should start by creating a diagram of the downstream industrial chain for whichever product they're going to explore. Figure 4.16 shows a generic industrial chain. No matter how extensive or complex this chain may be, it will always include at least four basic roles: manufacturer, intermediaries, end-users, and specifiers.

Occasionally, a company may want to start off by exploring an immediate customer. This can be a good idea for suppliers that are in the dark about their downstream industrial chain (and that don't know who their integrators are). A supplier can learn about their downstream industrial chain by interviewing direct customers. From there, they can figure out which steps to take next.

Quite often, manufacturers worry that by visiting customers downstream on the industrial chain, they'll upset their intermediaries. Distributors are especially likely to get upset, since they might be suspicious of a supplier's motives (e.g. is the supplier trying to bypass distributors and sell directly to users?). The company setting up a Discovery Team should attend to these concerns as soon as possible. The company should explain that these are exploration activities, intended to help the company improve products or design new ones. And that, ultimately, the idea is to benefit everyone in the industrial chain.

It needs to be perfectly clear that the DT is not a commercial initiative. However, even if a direct customer tells the supplier in no uncertain terms not to visit the end-user, the DT has the obligation to do so. *The end-user is precisely the type of customer that an exploration program has to visit*. The conflict will just have to be resolved some other way. The supplier should point out that the end-user owns their product, lives with it and uses it (whether it's an ingredient or component product is immaterial). As a result, the end-user is also *their* customer and should be explored by the Discovery Team.

A company should visit a minimum of five customers per stage along the industrial chain (this assumes that the product is being used for a single market application). A company knows that it has visited the maximum number of customers once the most interesting ideas begin to repeat themselves.

Who Should the Discovery Team Meet with When They Go to the Customer's Facilities?

Who the Discovery Team meets with and talks to when they visit a customer depends on what kind of information they're looking for. What Fig. 4.9 shows is that the Discovery Team's research spans a wide range of issues: some of these require a broad understanding of a customer's business, while others require more detailed knowledge about product usage.

Figure 4.17 gives the reader a general idea of which members of a customer's personnel might have the most interest, knowledge or affinity with certain lines of inquiry.

Along with these relationships, a supplier should also keep in mind how important or impactful their product is for the customer's business. A product can be critical, strategic, or both. If a product is critical to a customer's business (e.g. an electric motor at a plant), it means that without that product, or in the event that it malfunctions, then a customer's operational continuity is at risk. If a product is strategic (e.g. a key ingredient in a finished product), it implies that the product can help a customer improve its opportunities on the market. As the reader may well be aware, if a product is neither critical nor strategic to a customer's business (e.g. anti-corrosive coating on the roof of their office building), then it will be harder to get attention from a customer's senior management.

Crucially, the Discovery Team needs to meet with people that have a relationship with the product/service in question. Specifically:

- The direct users of a product: people that are directly involved in using or handling a product/service during its service life.
- User-department managers: people who work at the customer company and manage departments where the product is being used.

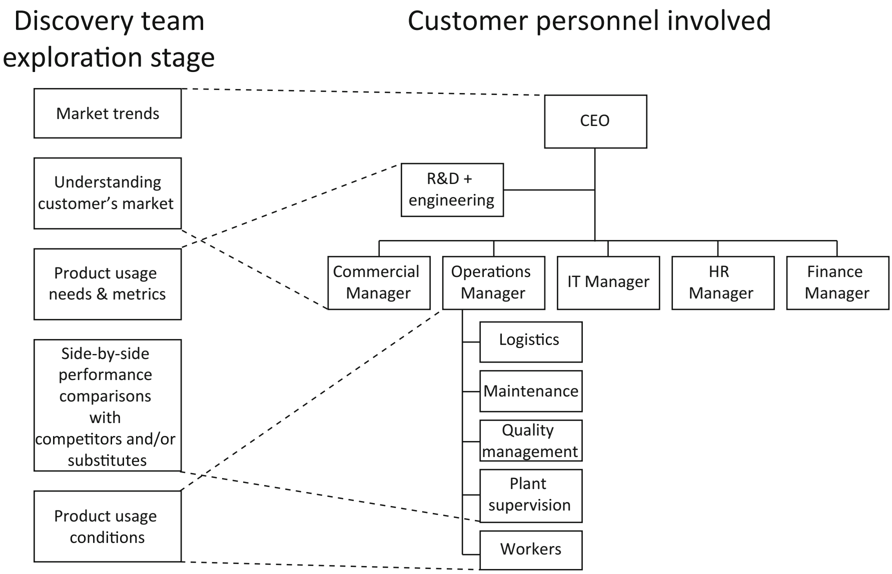

Fig. 4.17 This model proposes possible relationships/affinities between Discovery Team lines of inquiry and certain members (or departments) of a customer's company. This is a simplified model. A Discovery Team can use it as a guide for determining who they should meet with when visiting a customer

– Commercial managers: a DT will want to meet with commercial managers if it thinks that its product/service may influence a customer company's market position. Figuring this out can be hard. Until they've interviewed the commercial officer, many suppliers don't realize that their product plays a functional role in a customer's market position.
– Personnel in charge of product maintenance: a DT will want to meet with these personnel if the customer does its own maintenance on the product/service in question.
– Personnel from a customer's Research and Development department. For a Discovery Team, it's absolutely essential that they meet with this particular personnel. This is especially true if a Discovery Team is attempting to improve or design a product that would affect the customer's product.

The ideal is for a customer's personnel to participate collectively in DT activities. Generally, a DT will get a more varied (and less biased) perspective when they interview a group of people, as opposed to one person.

Requesting a Visit

A DT visit should be treated like any other important visit and, as such, a company should follow some basic formalities. It's best if a DT member (or the sales representative who has met the customer) contacts the customer and requests a visit. If there are several people at the customer company that the DT is interested in contacting, then the DT should figure out which department they're targeting, and send their request through a higher-up in that department. A company should respect a customer's corporate culture; doing so makes it easier to request a visit without causing any relationship problems (these could be due to a lack of proper communication). When requesting a visit, a supplier should be very clear that the visit is about exploring customers' needs and is not a sales visit. Other information the supplier should provide include: how many people are planning on attending the meeting and on-site observation (see below), what they want to observe, and the approximate amount of time these activities will take.

If suppliers are contacting an end-user customer for the first time (or another customer who they don't have much of a relationship with), then requesting a visit is a somewhat more difficult experience. It's important to always keep in mind that the purpose of the activity (and of the discoveries it makes) is to benefit customers. It's been this author's experience that most customers, once they understand what these visits and activities are for, are happy to help out the Discovery Team.

Partnering with Other Suppliers on Customer Visits

An industrial supplier can invite some of their own suppliers to partner with them on Discovery Team visits, and vice versa. This might occur when, for instance, improvements to a component product depend on the technology of its ingredient products. Here, a component product manufacturer (the one leading the Discovery Team) can invite the ingredient product manufacturer to come with them on customer visits (e.g. a manufacturer that makes medical equipment used for nuclear magnetic resonance imagining might require assistance from a processors manufacturer on visits to medical centers, hospitals, etc.). There's no doubt that this is an excellent and effective way to develop an application—it means that two organizations are finding opportunities to develop their respective products.

Nonetheless, whichever company is leading the Discovery Team should make sure that any ideas or new product designs are protected by a confidentiality agreement. A company that's invested time and resources into systematically exploring its market has a legitimate interest in being the first one to introduce better technologies into the marketplace.

Stage N°2. The Discovery Team in the Field

There are two tools that a Discovery Team can use to conduct fieldwork: customer interviews and on-site observation. An interview can disclose information that observation cannot, whereas observation can reveal information that isn't apparent in an interview. Just as the word implies, observation means that a DT is physically present in the field, observing and analyzing key aspects of a customer's operations that are connected to the supplier's product or service.

Whether or not a visit ends up being valuable to a company depends on:

- Choosing the right customers to visit
- Having a competent Discovery Team
- The competency of a customer's personnel
- How committed a customer is to making the visit worthwhile (in terms of the interview and allowing on-site observation)

As discussed above, a Discovery Team's competency depends on who its members are, the multifunctional nature of the team, and the skills team members acquire through training or experience in DT research.

Of course, no matter where they take place, these field visits end up building camaraderie within the group. People that eat, travel, and share an experience together, one that differs from their day-to-day work activities, will naturally end up forming closer bonds. And, no doubt, these bonds make it easier for people to cooperate and coordinate with one another during future activities (such as prioritizing discoveries, or briefing senior management).

A further outcome from these visits is that non-commercial personnel on the Discovery Team (such as research and development engineers, technicians, logistics and production personnel, etc.) end up gaining marketing experience. Once Discovery Team members are back at the company, they end up being excellent ambassadors for cultural change, increasing others' awareness, empathy and understanding of customers.

The Interview

If a company is truly committed to understanding its customers' problems and needs, then it knows that a big part of coming up with a good idea is asking the right question at the right time. These companies know that good marketers are the ones that work by formulating good questions—and that once they start asking good questions, it doesn't take long to get good answers.

It's worth remembering that all companies operate under certain assumptions. If a company is really passionate about serving its customers, then it'll be aware of its own assumptions—and, once in the field, the company will consistently test its assumptions to see whether or not they hold up. A direct interview with the right members of a customer's personnel can provide the kind of in-depth information that other, more rigid research techniques simply cannot (e.g. surveys, customer complaints, etc.). The key to a good interview is for an interviewer to ask intelligent, well-timed questions—this makes for a meaningful interaction between a customer's and a supplier's personnel.

Nevertheless, it's risky for a company to depend on interviews as their sole means of market research. Figure 4.18 shows a quadrant diagram for the variables 'interviewee's ability to articulate a problem' and 'interviewee's knowledge of a problem'.

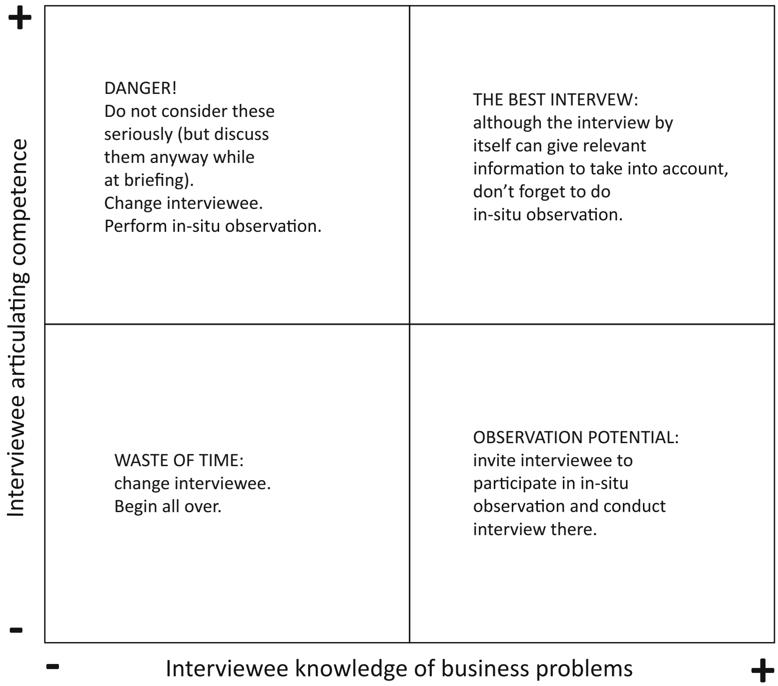

Fig. 4.18 This quadrant diagram consists of two variables: 'interviewee's ability to articulate a problem' and 'interviewee's knowledge of a problem'. As such, it exposes some of the risks inherent in customer interviews. Customers who fit the profile on the left side of the graph (and particularly, the upper left quadrant) are the most risky customers to interview. If a DT interviews someone who is very articulate yet out of touch with their company's problems, then they (the DT) may end up interpreting things incorrectly or in a way that distances them from the purpose of their research

A customer's ability to articulate a problem during an interview has to do with whether or not they're capable of verbally expressing what they believe or think. Not everyone is capable of accurately putting their thoughts into words—or, at least, not on every topic.

An 'interviewee's knowledge of a problem' can be defined as a customer's depth of knowledge and experience in dealing with a problem (or challenge) for a given product application. It's also an indication of how significant these problems are for a customer's business.

The four categories in this diagram can help a company determine whether an interview has the potential to be constructive, or whether it's likely to be disorienting or simply unreliable.

A Discovery Team should use this diagram whenever they go to conduct an interview. Of course, it takes a competent DT to know whether an interviewee fits the profile of one of these categories. Doing so requires DT members to have technological knowledge, conceptual knowledge of a product and its application, as well as knowledge they've accrued from conducting previous interviews.

Questions and Issues to Consider During an Interview

Discovery Team interviews should use a mix of standard and impromptu questions. Standard questions are the ones that get repeated from one interview to another, and from one customer to another. For instance:

– What problem/challenge is this technology supposed to solve?
– If you could change something about this product, what would it be?
– What would you like to see added to this product that would benefit its application and your business?

Then again, the most common impromptu question a company should ask is simply, 'why?'. A DT should ask this whenever a customer gives an opinion or makes a statement that's worth exploring in more depth. And, if something is unclear or vague, DT members should ask questions in order to clear things up.

At some point, however, the DT members should exercise addressing questions without holding the product or technology in mind. Centering most or all questions around a particular product or technology can prove to be a drawback when trying to understand the customer problem or its causes. This is called psychological inertia towards the product.

Also, there are some bad questions that a company should avoid. For the most part, bad questions tend to be confirmatory or self-referential. For example:

– Wouldn't you agree that our product NTH-6 is far more advanced than our competitor's product ZZT-4?
– Our company is very proud of this product. What are its advantages for you and your company?
– Everyone knows that the current technology is toxic in a fire. What do you think of our new design that's free of volatile toxic substances?

Other mistakes that a DT should avoid at all costs include:

– Sales personnel should never get defensive when faced by customer criticism (concerning pricing, services, etc.)
– Technical personnel should never get defensive if a customer criticizes the technology
– If a customer is starting a new project that might need a supplier's product, sales personnel should never use this as an opportunity to sell it to them.

It's good to remember that most customers aren't used to the idea of exploratory visits. And, for this very reason, a Discovery Team moderator has to be very careful that a visit doesn't turn into an occasion to discuss sales (this could be the customer's initiative, or the initiative of sales personnel on the DT) or air customer complaints. This might seem obvious, but in reality, it's far more common (and far easier) than one might think.

Creating a Discussion Guide for Customer Interviews

At first, creating a discussion guide might just seem like more paperwork, but, as we'll see below, it's actually very important. Interviews—as the reader may know from experience—can be very different from one another. Some interviews are highly organized, short, and decisive. Other interviews are less organized and less focused on the topics at hand, and still others are long and very unproductive. It's easy to lose track of good ideas if discussions don't follow some kind of logical order.

Conducting a good interview is similar to holding a good meeting: both require an agenda and leadership. In this sense, a discussion guide is rather like the interview's 'road map'. Not to mention, it ensures consistency from one interview to the next, or from one Discovery Team to the next (assuming that a supplier has created several DTs for several different business units).

What follows is a description of important stages in a discussion guide.

Introduction

Here, the DT moderator should state the objectives of the visit and interview. The moderator should introduce the customer to the various members of the DT and explain what each member's role is in the company. Also, the moderator should briefly explain what the Discovery Team methodology is and what the customer's team will experience during the visit. Following that, the moderator should ask the customer(s) to describe the nature of their business. This has two functions: first, it allows the company to test its own hypothesis about the customer's business, and second, it eases any tension and allows the customer to talk about something they're comfortable with. One other thing that's worth noting is that at least one member of the DT should be taking (exhaustive) notes. Odds are that the first few meetings with customers will be more qualitative than quantitative, so it follows that notes from these meetings will probably be more conceptual in nature. These notes can be extremely important. A DT might end up holding several meetings with several different customers in a relatively short amount of time; little wonder, then, that without some sort of record certain important details from customers could get forgotten or mixed up.

Assessing Opportunities in a Product's Application

With the moderator as a guide, the Discovery Team should have the customer describe various features of the application where the product is being used. Additionally, the DT should assess how important this application is for the customer's business and whether the customer has noticed any problems. The reader is reminded that 'application' refers to 'where, when, who, and for what' the technology in question is used. Since improvements to a technology can have a big impact on a customer's business (and perhaps on the entire downstream industrial chain), it's important to fully understand how the technology is being applied. Here, the customer may decide to share their own ideas about ways to improve the application in question (that is, the application where the supplier's product/service is being used). For the supplier, this could give them the opportunity to turn their *solver* product into a *positioner* product. This would be a hugely important discovery and would inevitably affect several links along the industrial chain, including the end-user and/or the ultimate customer.

During this stage, Discovery Team interviewers should feel free to ask any important questions and expand upon any significant points. Doing so will allow them to discover things about the application that the customer themselves may be unaware of.

Analysis of the Technology-in-Use

To start off this stage of the interview, it's a good idea to get a better picture of how important the current technology is for the customer's overall operations. Remember that a customer works with several different products and services at once, and that the product the DT is exploring is just another one of these. Understanding how important or critical a product is for the customer is essential: it keeps a supplier from making mistakes when improving or developing new products in the future.

The customer should share any impressions they have of the technology currently being used. Any and all opinions can be useful, but the ones that are most valuable are the ones that concern a product's use or its functionalities (see Chaps. 2 and 3). It's extremely important that the DT listen to the customer, and not project their own solutions onto the customer.

During this stage, if there are any functionalities that a customer requires from a product (and that a company has been unaware of), a DT should codify them and try to understand them as well as possible.

If possible, this is a good juncture for initiating on-site observations. This will be discussed in more detail below.

Metric Assessment

Over the course of the first few interviews, a DT needs to gather information that will help them develop an *economic benefits to the customer* metric (this metric shows how important a new technology could be for a customer's business). This metric, which is calculated using several estimated figures, is one of the easiest metrics to determine. Moreover, it's a powerful way of determining a customer's potential interest in a product improvement or new product.

Experience shows that a DT generally has to visit a customer several times before they can create a *performance metric for a new technology*. This depends on how complex the technology/application is, as well as the customer's ability to discuss the impact it would have.

Summarizing and Closing the Interview

The moderator should summarize what they've learned from the customer(s) during the interview. This is a good way to go over any new ideas, fix any misunderstandings, or add information that the customer might remember at the last minute. Also, at this point, a DT should get a customer to reiterate their vision for their business (this should include both an overall definition, as well as a strategic one). Since the interview will already have discussed the product in-depth, having the customer refer back to their business vision might inspire DT members to think of some new ideas.

Lastly, towards the end of the interview, the moderator should reign in the customer's expectations and remind them that the supplier won't necessarily be able to take responsibility for all of the issues discussed. What the customer should understand is that the supplier is going to analyze customer problems and see how feasible it is to fix them. The customer should be aware that, at least in the short-term, not all problems can be fixed.

On-Site Observation

At this point, a Discovery Team goes and physically observes the customer's operations (the application) where a product or service is being used. The purpose of this observation is to find out how the product operates in a 'real life' setting. It allows the DT to see whether there's anything unexpected about how the product functions, and/or detect any problems that the customer may not have identified.

There are several advantages to on-site observation, including:

- A supplier gains insight into a technology in the environment where the technology is applied
- A supplier can learn about aspects of the technology that the customer has chosen not to share
- A supplier can learn about aspects of the technology that the customer knew about, but deemed irrelevant
- A supplier can learn about aspects of the technology that the customer was either unaware of or didn't remember, and that are key to a future product design

When it comes to market exploration, customer interviews offer several advantages that are simply unmatched by other research techniques. These include: learning from a customer's accumulated experience with a product, learning how a customer conceptualizes their own needs, and discussing any ideas the customer may have about possible product improvements or new product developments. However, there also serious disadvantages to customer interviews that the Discovery Team should be aware of: the quality of an interview largely depends on the competency of an interviewee, and, equally important, all interviews are inevitably filtered through a person's memory. Memory can be selective or even manipulative.

Furthermore, given that industrial market exploration is scientific in nature, the DT will need to get objective information from the field, including: environmental factors, performance figures, usage and handling conditions, etc.

As such, on-site observation serves as a good counterpart to customer interviews. When a DT goes with a customer to observe the application of a technology, a customer will recover a fuller and more realistic sense of the technology (more so than if they only rely on memory). They might recall other needs or ideas that they hadn't mentioned during the interview. And, so long as the supplier is knowledgeable about the technology involved, there's a chance they'll discover other phenomenon that the customer was unaware of.

When planning an on-site observation, a DT should consider the following questions:

– What is the DT looking for?
– What stage or process in the industrial chain should be observed?
– How will the DT conduct its observation and record its findings?
– Who should participate in field observation?

What Is the DT Looking for During On-Site Observation?

Sooner or later, someone with experience in on-site observation will realize that there are two types of observation: observation of product limitations and observation of product evolution.

Observations of product limitations are findings that show that a product or service's performance is below a customer's needs. These types of observations can have an effect on product improvements or new product development. It's possible to find this type of deficiency at any stage in a product's logistics chain: product dispatch, transportation, reception, installation/integration, usage, product recycling, etc.

For example: an electric motor that stops working when it gets overheated, a component that has to be forced into place when it's installed, a robotic machine that requires constant calibration, etc. This type of observation is directly related to the idea of a *solver* product (see Chap. 3) and a customer's operational needs (see Fig. 4.10). As such, it's important that it not get confused with instances in which a product has manufacturing defects or fails to comply with product specifications.

Observations of product evolution are instances in which a DT finds that a product has a use, functionality, or attribute that the supplier hadn't foreseen (e.g. when a backhoe loader originally made for tunnel construction is used as mining equipment due to its high degree of precision). As a general rule, these types of findings occur at the end-user level. Undoubtedly, they can be incredibly strategically significant, both for the customer as well as the manufacturer. The following questions are meant to encourage observations of product evolution:

– Why is this technology being used for this application?
– What benefits is a user looking for when they use this technology?

– Which of its functions are being performed unsatisfactorily?
– Why is this technology being used at this place, this time, or at this point in the process?
– Is this technology satisfactorily integrated into its upstream and downstream processes?

These last two questions are incredibly important. A lot of industrial manufacturers just dispatch their products and don't stop to think about the orders or specifications that they're given. These manufacturers treat their products as if they were ends in themselves; and, as a result, they overlook things such as environmental factors where a product is used, or any processes that occur before or after the product is applied. This is represented in Fig. 4.19a, b.

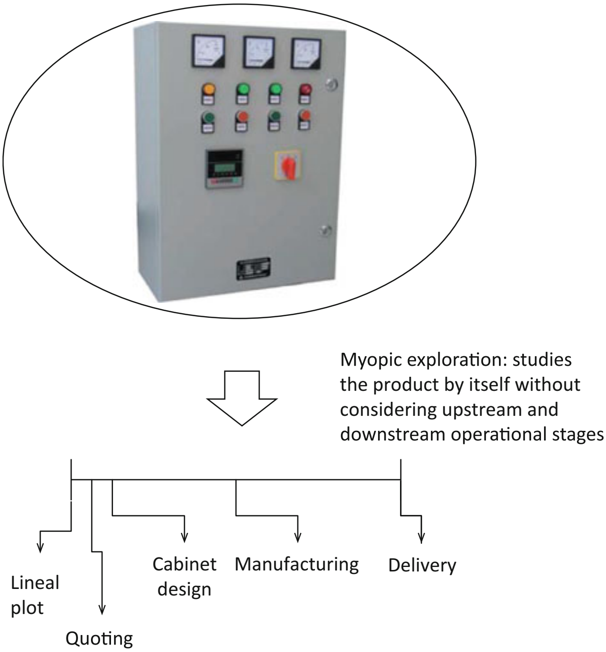

Fig. 4.19 (**a**) Here, the manufacturer treats the electric cabinet as an end in itself. Myopic market exploration leads to myopic design and manufacturing, and vice versa. The Discovery Team should remember that the product is integrated into a customer's overall operations (that is, it doesn't function in isolation). The electric cabinet shown above only takes into account what the customer requires from the cabinet itself—a clear case of myopic market exploration. Observations of product limitations can help a manufacturer improve the electric cabinet's design and manufacturing process. However, without observations of product evolution, a manufacturer will lose far more compelling opportunities to expand their product's functionalities and/or attributes.

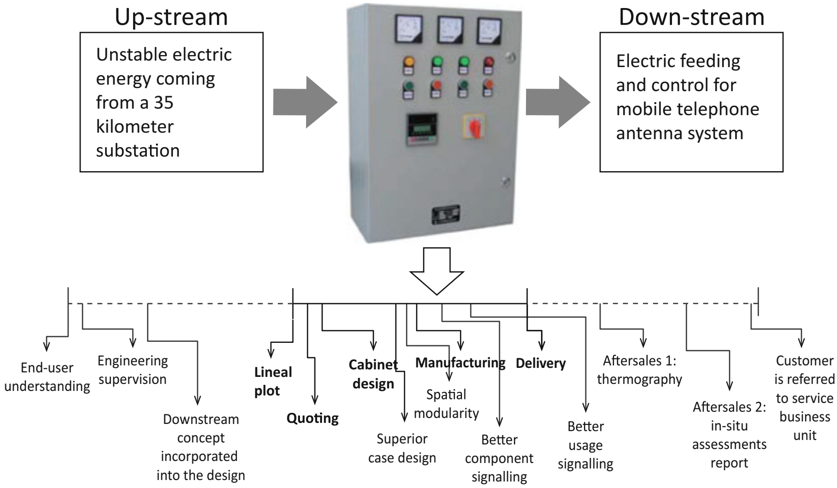

Fig. 4.19 (continued) (**b**) Example of an electric cabinet that's been designed according to observations of product evolution (see text). This type of observation centers on functional issues pertaining to a product's upstream and downstream processes. This means that a manufacturer isn't just focused on improving a product (through observation of product limitations). Rather, a manufacturer may end up redefining their product's functionalities, as well as their own role as a supplier (by supplying a new product concept). This figure shows that a manufacturer has far more opportunities when they engage in on-site observation that takes into account a product's *upstream* and *downstream* processes

Discovering a new functionality for a product can be incredibly strategically important for a company. As will be discussed in later chapters, industrial suppliers tend to identify only one or two functions in a given product or service. Findings of this sort can help a manufacturer specialize a product, or even introduce an entirely new product for an entirely new application. Chapter 5, which focuses on industrial market segmentation, goes into greater detail on identifying new product functionalities.

It's important to be clear that both types of observation (product limitations and product evolution) are necessary. Observation of product limitations will help a company solve any basic performance problems that their product may have. Meanwhile, observations of product evolution pave the way for strategic changes within a business unit.

What Stage or Process in the Industrial Chain Should Be Observed?

From the time it's dispatched to the time it's recycled, a product undergoes numerous stages and processes. For a newly formed Discovery Team, figuring out where along the industrial chain they should focus their energies may seem like an overwhelming task.

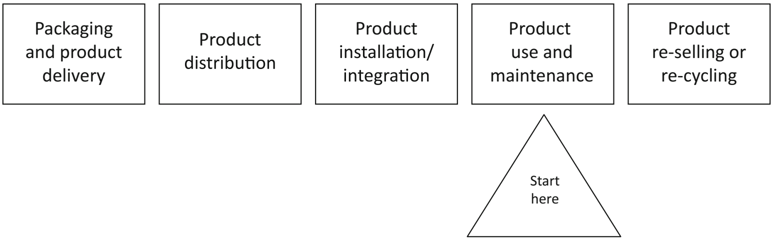

Fig. 4.20 From the time it's manufactured to the time it's recycled, an industrial product goes through several business stages. Of these, it's absolutely necessary that observation take place during the 'product usage' stage. What's more, it's a good idea for a DT to begin their market exploration at this stage

Figure 4.20 shows the various stages that a product goes through after it's manufactured and dispatched to customers.

No doubt, on-site observation of a product application can have a huge effect on future demand for the product. This is because findings from this stage in the industrial chain can end up revolutionizing a product concept, and even—on occasion—an entire industry.

For example: flash memory cards (the kind that are used in various personal electronic devices) owe their development to a specific discovery in transistor technology. Clearly, observations at the end-user level can lead to innovations that the end-user themselves would never have thought possible. It might not take very long for some of these ideas to materialize in a new product; admittedly, however, there are other ideas that a company will need to spend more time experimenting with.

A Discovery Team that wants to come up with powerful ideas—ones that will have a big strategic (and historical) impact on a company—should really start off their investigation (interviews and on-site exploration) by focusing on the end-user.

Of course, a company can also find plenty of opportunities for improving a product by observing the product's installation, assembly, or integration. In fragmented industrial markets, the purchasing power of companies that install, assemble, or integrate a product shouldn't be underestimated. Furthermore, if a company manages to lower costs or shorten a product's installation time, this could also end up affecting the end-user.

Putting time and resources into observing a product's distribution can be well worth it: it can lead to important findings that benefit the companies that install the product and, especially, the end-user. No doubt, an industrial product distributor won't hesitate to adopt innovations that improve their sales and profitability. However, a company needs to be careful: many of these ideas may be costly to implement, and they may not generate benefits for downstream customers.

How Should the DT Conduct Its Observation and Record Its Findings?

Field observation is a research method that was originally developed by sciences such as anthropology and sociology. As such, both anthropologists and sociologists distinguish between 'participant observation' and 'nonparticipant observation'. Nonparticipant observation means that an observer tries to be as inconspicuous as possible—the aim is for the people they're observing to be unaware that they're being observed. As one might guess, it's either difficult or next to impossible for a company to go into a customer's facilities and observe them in this way.

By definition, a Discovery Team's observation is participant observation. The people being observed are aware of this fact. What's more, during observations, DT members will necessarily want to interact with customer personnel in order to ask them questions.

The time it takes to conduct an on-site observation varies from case to case. It largely depends on the nature of the product or operation that a DT is going to observe. In some cases, an observation session may only take 1 or 2 h, while in others, it may take days or even weeks. Naturally, the DT needs to contact the customer beforehand and make sure that the operation in question will be going on during their visit.

Below is a list of guidelines on how to conduct an observation:

1. A DT may take notes, photos and film with the customer's permission.
2. Any interesting phenomenon, variable or condition should be recorded.
3. Any ideas that DT members have during the observation should be recorded.
4. If the DT comes across some interesting phenomenon, they should look for any other data that is relevant to it.
5. DT members can clarify their questions with the customer member accompanying them on the observation, or with the people they're observing (however, the DT should try not to interrupt the operation in progress).

At the end of an observation session, a DT should hold a debriefing meeting; hopefully, the customer personnel that accompanied the DT during the observation will also participate in the meeting (for more information, see below).

Who Should Participate in Field Observation?

An observation team is a subset of a Discovery Team, and, as such, it shouldn't consist of very many people (e.g. no more than 4 or 5). In order for a Discovery Team to determine who will be on the observation team, they can use the following three criteria:

1. Which members of the DT is it absolutely necessary to have present during a field observation?
2. Is it necessary to have an independent consultant present during the observation?
3. Which members of the customer company is it absolutely necessary to have present during a field observation?

In response to the first question, there are two types of people from the supplier's company that should be included on the observation team. First, there should be someone with in-depth knowledge of the technology under observation. This person's familiarity with the technology, however, shouldn't keep them from asking progressive (and even daring) questions. Second, there should be someone who is *not* familiar with the technology; someone like this is capable of asking questions that bypass the sort of long-held assumptions and constructs typical of someone who has worked with the technology for a long time. It goes without saying that this person shouldn't ask questions as a way to make up for their lack of technical knowledge. The answer to the first question provides an answer for the second. If there's no one on the Discovery Team who meets these requirements, than the DT should invite an outside expert on the technology to participate in the observation.

As for the third question, it's good to invite technical personnel that are involved in the operations where the technology is used (engineering, R&D, production, etc.), as well as an executive from the customer company (that is, someone with more conceptual knowledge of the customer's business). Whether or not an executive agrees to participate will depend on how important they consider the supplier's technology to be.

The supplier should remember that as a product development project progresses, it's very likely that the Discovery Team will need to revisit (perhaps several times) the customer's facilities. Naturally, this means more on-site observation, giving the DT a chance to clear up any more specific questions and solutions they may have. This is depicted in the schema in Fig. 4.21. These successive visits (and technical iterations) allow the DT to identify a customer need and even present a technological solution (a product concept). As such, the DT will probably want to meet with different people each time it conducts on-site observation; and, a DT should anticipate that as the project progresses, the people involved in on-site observation (both on the supplier's end, as well as the customer's) will need to be people with greater and greater technical expertise.

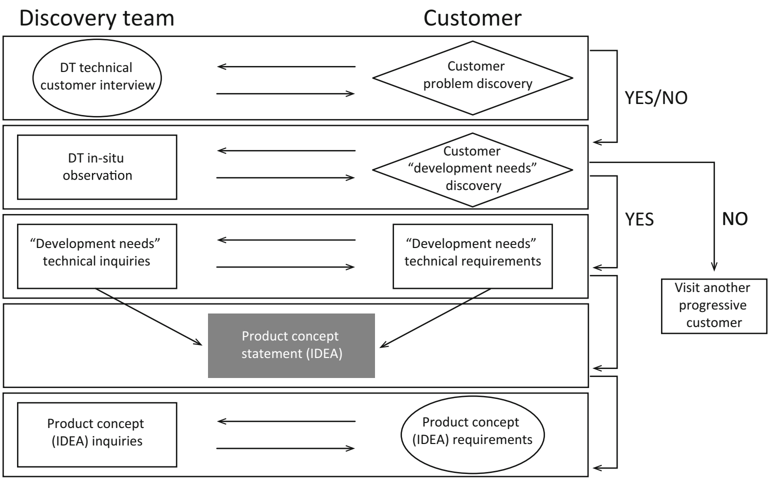

Fig. 4.21 After successive technical iterations with a customer, a supplier may disclose a customer need at the same time that they reveal a technological idea or solution to that need (shown in *gray*). Once they’ve established a product concept, a Discovery Team will need to conduct more detailed research. The information they gather (which will be more specific and precise) will lend further support to their product/service development program

Debriefing After Each Discovery Team Visit

As soon as a visit ends, a Discovery Team should hold a debriefing session—this gives the Discovery Team a chance to summarize and analyze its findings. This particular meeting is extremely important. It’s here that the Discovery Team can begin to figure out how they’re going to present, explain and prioritize their findings when they report them back to their organization.

There are several advantages to holding a debriefing session immediately after a visit, including:

– It gives the DT a chance to begin analyzing its findings. The DT can compare the recent visit to previous ones, discuss any patterns in its findings, and clear up any questions DT members have.
– It allows everyone to reach a consensus about their conclusions. Two different observers may arrive at divergent conclusions about certain findings. A debriefing session gives them the opportunity to arrive at a consensus, thus encouraging greater precision.
– It allows them to state what they’ve observed. As shown in Fig. 4.22, details and ideas from a visit can be quickly (and easily) forgotten. A debriefing session is a chance to record any findings that might be stored in people’s short-term memory. Also, it’s quite common for different members of a DT to focus on different aspects of the findings. The analysis and iterations that take place during a debriefing session give DT members a more complete understanding of a customer’s problem.

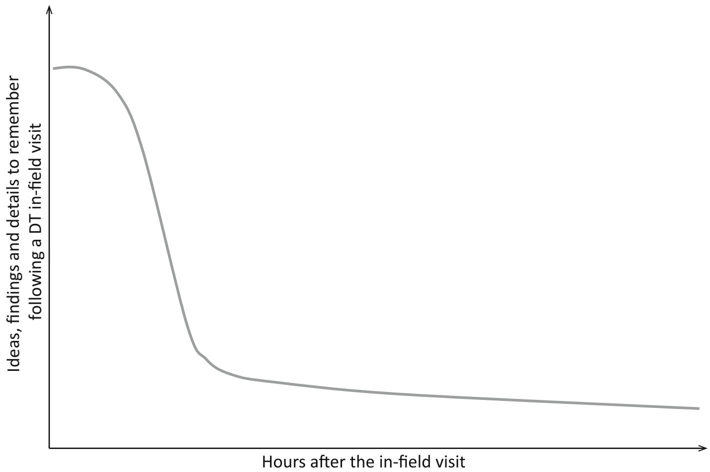

Fig. 4.22 This graph shows how important it is to hold a debriefing session immediately following a DT visit. If a DT doesn't hold a debriefing meeting after a visit, it only takes 1 or 2 days for details to get lost, ideas to get mixed up, or for people to start questioning these ideas' legitimacy. Also, as time passes, people's incentive, drive, and motivation to discuss a visit diminishes

– The DT can brainstorm questions for future interviews and on-site observations. Market exploration should be an ongoing process, not an event. As the DT's findings become more and more *sophisticated*, they'll identify new questions that will need to be resolved on future visits.
– It can spur creative solutions or solution modeling. Some of these can being insights that might be as important (or even more important) than some of the findings obtained directly from customers.
– It's a half-way point at which a DT can reevaluate certain aspects of their research program (reedit questions or lines of inquiry, modify the program, give feedback to a member that hasn't adhered to the method's principles, etc.).

It's a good idea for a DT to use a debriefing guide to help them record their findings.

Figure 4.23 provides the reader with an example of one such guide: a metric table that includes several variables. Each time they go to visit a customer, the DT can add more information to the table.

Below, the reader will find explanations of some of the variables that the DT should go over during the debriefing session.

Column 1. Customer Company Name: here, the DT should record the customer company's name or brand. This can be helpful later on in case people have questions about where such and such idea came from. It can also be helpful for determining whether or not a particular need is representative of a wider pool of customers, and whether it can be counted on to generate future sales.

(1) CUSTOMER (company)	(2) THE APPLICATION	(3) NAME/POSITION of the people visited	(4) DATE of visit	(5) THE PROBLEM/NEED statement	(6) DETAILS of the problem	(7) CURRENT TECHNOLOGY IDENTITY	(8) THE COSTS OF THE PROBLEM for the customer ($/time)	(9) POTENTIAL MARKET of the new product concept
Mining Corporation Inc.	Cables that supply energy to mining cranes	Johannes Schmidt, Electricity Superintendent. Peter Moltke, Maintenance Superintendent. Raymund Comway, crane operations chief	September 16, 2015	Pilot inside cables are cut all the time. This generates a safety hazard	40% of current cables in use have the pilot conductor cut off.They are probably cut by land slides, rocks and machinery	SHDGC cable	US$5,5/yr	+30% market share
				After a land slide, the cable is covered and undetectable	Customer loses precious time looking for the covered cable	SHDGC cable	US$10.000/yr	+1% market share
				We have bad quality communications with the mine. Cables are the only devices between us and the mine. Idea: the cable could have a communication conductor inside to communicate with people and machines	Good communication is essential for management control, safety issues, and machinery feedback	SHDGC cable	To be determined	To be determined
				Etc.	Etc.	Etc.	Etc.	Etc.

Fig. 4.23 Example of a summary table that a Discovery Team can use to record their findings. This is an extensive and generalized tool—a Discovery Team can use it either to record their findings after each visit (during their DT debriefing session) or prioritize ideas before bringing them to fruition

Column 2. By keeping a record of a customer's market application, a DT can determine how representative that customer's needs are (or any ideas that relate to their needs). Furthermore, by assessing an application's size, it will be easier for a DT to determine the financial impact of a potential new product.

Column 3. Name and job title of the people the DT met with on their visit. If a supplier is going to develop a new product in response to a customer need, the DT needs to know which members of a customer company contributed to their perception of that need (see Chap. 6). Knowing people's job titles or position is also important: it can help a DT figure out which ideas and needs to prioritize, and how likely those ideas are to generate future sales at different hierarchical levels within the company.

Column 4. Date of observation and/or interview.

Column 5. The 'customer's stated problem/need' is the most important variable in this table. A customer's need for a given application should be worded as clearly as possible so that someone who is not part of the Discovery Team will be able to understand it. Indeed, when enough time has passed and people's memories begin to fade, even members of the Discovery Team will be thankful that they've made this section easy to understand. Once they've outlined a customer need, a DT or a R&D team will need to come up with a wider set of characteristics (design specifications) that a product should have in order to fulfill that need. As such, each stated need calls for a different performance metric. And, in turn, these product performance metrics may mean that a product's design incorporates more and more design specifications.

Griffin and Hauser[2] have created a useful guide for how to state customer needs (column 5):

– A need should be expressed in terms of what a product should do, not how it should do it. A Discovery Team will find that since customer personnel tend to have technical knowledge, they often want to contribute their own ideas for how a product should be designed. While some of these might be good (or even brilliant) ideas, a needs statement should be as objective as possible about how a future product will be designed and how it will function. Any brilliant ideas that a customer may have should be recorded elsewhere so that they can discussed in the future.
– A needs statement should include any relevant details expressed by the customer. If necessary, a need can be expressed in different ways so that no important details are left out.
– If possible, it should be expressed in positive, rather than negative, terms (e.g. a product will do such and such, rather than a product shouldn't do such and such). This makes it easier to formulate these needs as technical specifications for a product.
– These needs should be expressed as possible product attributes (e.g. the equipment will be manually transported by an operator).
– Avoid using the words 'must' and 'should'. This suggests that an attribute or need is a priority.

Column 6. A DT should record details about whatever problem a customer is having with the application (a problem that, as yet, has no good solution). Later on, these details will help a supplier develop product performance and economic benefits metrics for the new technology.

Column 7. By properly identifying the product or technology in question, a DT can contextualize a customer's need. Remember: some of the most demanding needs are the ones that have to do with a product's functionality at the end-user level. Sometimes, a single customer may use several of a supplier's products—if a DT isn't careful to identify which product they're investigating, this could generate a lot of confusion. If the product or technology in question doesn't exist yet, then the DT can fill in this space by recording the product idea or concept (as discussed earlier, once a need or problem has been properly understood, it doesn't take long to come up with a product concept).

Column 8. How much the problem is currently costing the customer. Assuming a supplier manages to come up with a solution and implement it, these calculations

[2] The Voice of the Customer. Griffin, Abbie, Hauser, John R. Marketing Science, Vol. 12, N°1. 1993.

will be the basis for their economic benefits to the customer metric. Not to mention, having an approximate idea of the costs associated with a problem gives a supplier a better picture of how important a problem is and how willing a customer will be to adopt a new offering. It's imperative that a Discovery Team present these calculations to company executives during briefings. Finally, these calculations will help determine which ideas should be prioritized and explored by the new product development department.

Column 9. Market potential for the target application. Here, the company's market experts should state their projections for the product concept's market potential (that is, the product concept that fulfills a customer need described in the metric table). These calculations can include a product's regional or global applications. They can be written either as: a ratio of monetary returns over time (e.g. €/year), and/or the amount of product units the company could reasonably expect to sell. A company can use the information in Columns 8 and 9 to prioritize ideas and assess a product's commercial feasibility (see Chap. 6).

A Discovery Team's Briefing with Company Executives

Once a Discovery Team has reviewed all of their discoveries and ideas for a market application (and recorded these in the summary table), they need to present their findings to a larger committee of people within the company. This committee should be made up of senior officers—people with the authority to decide which ideas or projects will go forward.

These findings should be regarded as strategic, confidential, and highly important for the company. However, even when a good idea potentially benefits both customer and supplier, developing the idea can entail significant investments and a course of action that would affect the entire company. This is essentially why Discovery Team findings—and the prioritization of these findings—need to be reviewed by people in positions of authority and leadership. It's the latter who will be able to move projects forward, mobilize personnel, mobilize investment, and prioritize certain activities over others.

When a Discovery Team is prioritizing their ideas for the first time, they should do so on the basis of certain objective variables—ones that benefit both the customer as well as to the supplier. Namely, there are three variables that they should consider: how costly the problem is for the customer (Column 8), a product's market and sales potential (Column 9), and the product's time to market.

In some instances, the confluence of customer costs + sales potential + time to market will convince upper management that it's worthwhile to proceed with a project. The Discovery Team will be allowed to continue their investigation of the main ideas in the summary table.

In others, technical prudence may dictate that certain ideas have to be put on stand-by. This could be because of the costs involved in developing improvements, the lack of technology to develop improvements, etc.

Keeping a Record of Important Market Discoveries
Companies need to understand that any significant market discoveries they make are actually company assets. And, like any other asset, these discoveries contribute to a company's worth. This asset belongs to stockholders, and, in some form or another, it also belongs to whichever customer articulated the need. If a Discovery Team comes across an interesting idea in the field, they need to leave a record of it within the company. The idea must be properly documented (in the debriefing summary table, for instance) and filed. Why? Because if company administration decides not to pursue an idea, then, in the future, it may be important to know why. There are numerous instances in which company higher-ups decided to veto an important development idea, only to find out later on that competitors or substitutes were successful with it. People's 'I-told-you-sos' can get particularly bad in this kind of situation. Over time, a company can learn a lot by reviewing old ideas that never materialized and asking themselves why these ideas were deferred.

Stage N°3. The Metrics and Technical Specifications of Customer Needs

Well-planned and properly executed market research allows a supplier to go beyond the more obvious critiques of a product. The supplier can uncover problems and needs that even customers are unaware of.

A supplier needs to fully grasp a customer's problem or need and put it into words (see above) before they can start identifying the new product's technical requirements.

For instance, in the food manufacturing industry, a customer might need their factory's floors to be covered with an antimicrobial floor coating (the desired functionality). Before a supplier can begin researching the new product's desired technical specifications, they'll need to have a comprehensive understanding of a customer's problem/need. This is what the Discovery Team and metrics research are there for.

During the metrics research stage (see Fig. 4.9), a Discovery Team should document information regarding:

– The solution (discussed above)
– The usage conditions
– The various metrics

If a supplier is designing a new technology, they'll need to research its usage conditions. The purpose of this research is to find out what environmental requirements there are or what circumstances the product/service will be exposed to. For instance, the floor coatings supplier (see above example) will need to control for variables such as temperature, humidity, acidity, people's usage of the space, the causes of microbial growth, etc.

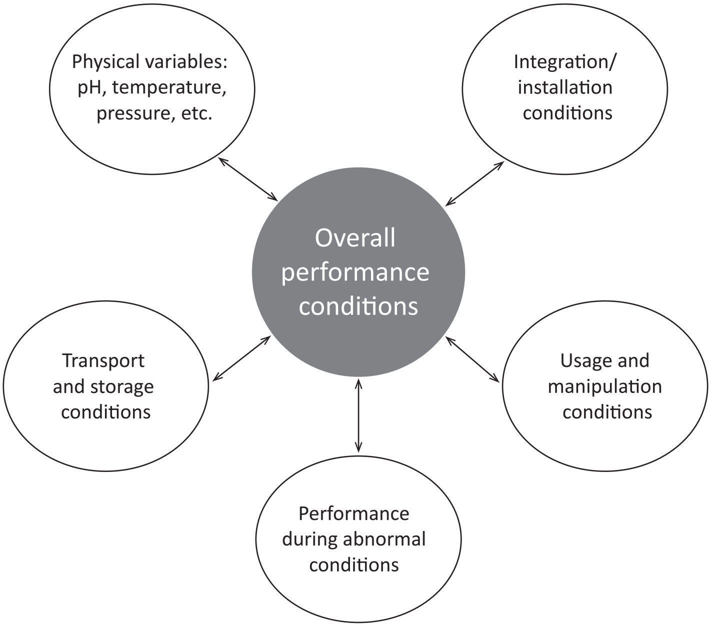

Fig. 4.24 Five types of circumstantial variables that could affect a new technology's performance level. A supplier should search for these variables all along the new product's industrial chain—from the time it's manufactured to the time it's recycled

All along the industrial chain there are variables and conditions that could compromise a product's functionality and that should be explored by the supplier. These variables are represented in the schema in Fig. 4.24, and they are discussed in greater detail below:

- Analysis of conditions in a product's physical environment. This is an analysis of any environmental factors that could affect a product's performance (and thus, should be taken into account when designing a product). Here, a supplier should make sure to document variables such as: temperature cycles, humidity, acidity, salinity, chemical reactions, pressure ranges, wind speed, the presence of any pollutants, etc.
- Analysis of usage/handling conditions. This is an analysis of how a product will be used by the customer (its mode of operation; this needs to be taken into account when designing a product). This type of analysis includes variables such as: how the product will be operated by trained personnel, how often it will be maintained, how the product ties in to other mechanisms, etc.
- Analysis of installation/integration conditions. This is an analysis of conditions that ensure that a product can be properly and effectively installed or integrated (this should also be part of a product's design). For example: ease of installation,

(customer problem cost x % of problem solved by supplier's offering)
- offering price
= customer economic benefit

Fig. 4.25 This equation shows how much a customer stands to benefit economically by adopting the new technology. This example does not take into account a competitor's offering (see Chap. 11). In order to figure out how much a problem costs a customer, a supplier can use historic data, or else current data from a facility that is still using the old technology. This amount should be divided by whatever percentage (%) of the problem the new technology is able to solve. The 'price of the product' refers to how much it costs the customer to buy and use the new technology. The result is the monetary amount that the customer will save by using the new technology

the installation contractor's safety, factors that keep a product intact during integration or assembly, etc.

- Analysis of transportation and storage conditions. As the name suggests, this analysis focuses on any variables that could affect a product during transportation or storage. It is similar to an analysis of a product's usage environment. Here, a supplier needs to investigate environmental factors that could affect a product from the time it's manufactured to the time it reaches its final destination.
- Analysis of potential circumstantial anomalies. A Discovery Team should analyze how a product reacts in response to extreme situations (anomalies). This could include cases of: fires, landslides, earthquakes, explosions, voltage spikes, etc.

These analyses should be done by visiting the places where a product is transported, stored, and put to use. If a manufacturer overlooks this kind of information, they run the risk of designing and developing a product that can only function under a certain set of conditions. No doubt, this could produce serious setbacks for a customer.

The Economic Benefits to the Customer Metric

The diagram in Fig. 4.9 includes three types of metrics. The first of these, the economic benefits to the customer metric, outlines any savings or financial gains that a customer will receive by buying and using the new product.

This calculation should be stated as a monetary amount. It should take into account whatever savings or financial gains are currently offered by the prevailing technology or by competitors' products/substitutes. These side-by-side comparisons have to show that a customer would benefit financially from using a supplier's product.

Naturally, these calculations vary depending on the nature of a product and what the product is used for. A supplier can use the equation in Fig. 4.25 to calculate a customer's economic benefit.

The equation itself is intuitive, but it requires some necessary calculations. Determining how much a problem costs a customer is the easiest part—a Discovery Team can get this information on their visits to a customer's facilities (this is

(1) CUSTOMER (company)	(2) THE PROBLEM/NEED statement	(3) DETAILS of the problem	(4) CALCULATION DATA AND VARIABLES	(5) CALCULATIONS	(6) THE COSTS OF THE PROBLEM for the customer ($/time)
Mining Corporation Inc.	Power and control cable break frequently. As a consequence, the drilling machine is rendered out of work.	The customer has 6 drilling machines. Power and control cable break every 6 months. Each drilling machine has to be repaired during 5 days. Cause: over bending of the cables	1. Customer's annual production of metal. 2. International price of metal. 3. Customer's production costs per ton. 4. Total downtime of drilling machines.	Operation profits/ year x (total downtime/365)	US$ 22 million/yr

NEW PRODUCT CONCEPT	PERFORMANCE VARIABLES (THE METRIC)	METRIC PERFORMANCE UNIT	AIMED VALUE	ECONOMIC BENEFIT for the customer
Elbowed power and control cable	Operating time without break downs due to cable bending	months	81	US$14 millon/yr

Fig. 4.26 The uppermost table shows the results of a supplier's economic benefits to the customer analysis. The information in Columns 1 through 6 can be used to determine how much a problem is currently costing a customer. The lower table indicates the performance level of the new technology that will be used to fix the problem. Not included in this diagram are the manufacturing costs or the potential price of the new product

assuming that a customer is cooperative; which, in most cases, they are). Of course, these calculations are influenced by factors that are specific to each problem: how acute the problem is, the technology and application involved, environmental conditions, the production volume, etc. The upper half of Fig. 4.26 shows information that a supplier can use to determine how much a problem is costing a customer. The greater the costs incurred by a customer, the more opportunities there are for a supplier to develop technology that a customer will want to adopt.

A new technology might not completely (100 %) solve a customer's problem. There are several reasons for this: limited supplies, production limitations, design or engineering limitations, etc. For a more in-depth look at feasibility analysis, the reader can turn to Chap. 6. A supplier can use their technical knowledge to assess how much of the customer's problem they'll be able to solve. The cost of the problem should be divided by the performance percentage of the new technology (see the equation in Fig. 4.25).

Next, a supplier should determine how much it will cost their target customer to buy and use the new technology. Of course, this requires some hypothesizing. Here, a supplier can use their technical knowledge and experience to determine: how much the new product will cost to manufacture (this varies depending on production

(1) THE PROBLEM/NEED	(2) THE PERFORMANCE METRIC	(3) PERFORMANCE UNIT	(4) AIMED VALUE
Colder air, more pressure and less energy consumption	Output air flow	SCFM (standard cubic feet per minute)	600
	Output air pressure	Bar	6,5
	Output air temperature	°Celsius	4
	Electricity power consumption	KW/100 cfm	6

Fig. 4.27 The performance metric measures different variables that are directly related to the customer's needs. In the above example, the customer need requires four different performance metrics. A supplier's goal is to offer a customer a product that lives up to the customer's expectations and requirements

or sales volume), the potential price of a product (this depends on its life cycle stage), and the new product's operating costs.

A product's price may be influenced by other competitors and their offerings. However, since this example is focused on an entirely new product, this won't be included in the calculations.

Nevertheless, an industrial marketing strategist will need to assess other competitors' offerings on a case-by-case basis (and determine how relevant they are). If necessary, they'll need to include this information in these calculations. For more information on how to determine pricing, the reader can turn to Chap. 11.

The Product Performance Metric

The performance metric has to do with the benefits a product provides, such as functionality and attributes. It outlines how well the product's features have to perform in order to solve a customer's current problem (this performance level is expressed in numbers, or metrically). In other words, it's a numerical expression of what a customer requires from a new offering.

Figure 4.27 gives an example of a customer that requires "a greater volume of cold air, increased pressure, and reduced energy consumption" (Column 1). This need calls for four different performance metrics, as shown in Column 2.

Each attribute or functionality in the customer's needs statement has its own performance metric. Each of these performance metrics has to be stated and calculated separately. Column 3 shows which unit of measurement will be used for each metric. Once a supplier has determined what their performance metrics are (Column 2), then it shouldn't be difficult to determine which units of measurement to use.

Finally, Column 4 shows the desired performance level (expressed as a numeric amount) for each variable.

The performance metric raises the bar on technological development and it's a standard way of comparing different product prototypes. If a product deviates from its desired performance metrics (either exceeding requirements, or falling short of them), then this will affect its price. Suppliers that are dealing with highly complex customer needs or a highly complex product can use the House of Quality, a house-shaped diagram that is part of the Quality Function Deployment (QFD).[3] The House of Quality is a very effective tool for turning complex customer needs into technical specifications. It's been described as a tool that translates a customer's language into the language of an engineer.

As the reader already knows, each customer need can be addressed by any number of different product design metrics. In Fig. 4.27, for instance, there are several different design options that could solve the customer's need for increased air pressure (these options won't necessarily involve the more traditional modifications to air compressor technology). Having different 'metric solutions' for a single problem can be key, especially when it comes to more complex products—it can help product developers discuss important trade-offs in engineering design.

Design and performance trade-offs occur when a product has certain technical specifications that are incompatible with one another. This might be a technical incompatibility (e.g. it's impossible for a product to have both attribute A and attribute B) or it could be an economic one (e.g. a product with attribute A outperforms a product with attribute B, however, A is far more expensive to manufacture than B). Making these compromises is one of the hardest parts to refining a product's performance metrics and technical specifications.

The Product Design Metric

The design metric is also known as the technical specifications for product design. These technical specifications, or characteristics, are chosen by the designer-manufacturer, and they allow the product to reach its desired performance level (see *performance metric* discussed above). As such, a manufacturer's design metric is closely related to its product development program.

Figure 4.28 provides an example of a design metric for the variable 'increased air pressure' (from Fig. 4.27). In this case, researchers should ask themselves: given conditions at the customer's facilities, what are the design implications for a new air compressor so that it provides greater air pressure?

During meetings with industrial customers, both customer and supplier will frequently propose different engineering solutions to a problem. When discussions with a customer are very technical, it's common for both sides to want to discuss different design options for a new product.

These discussions can be interesting—and even constructive. However, to avoid getting off-track with theoretical goals, the supplier-manufacturer should always remember that the underlying purpose of these design ideas is this: to provide a benefit.

[3] Development History of Quality Function Deployment. The Customer Driven Approach to Quality Planning and Deployment. Akao, Yoji. Minato, Tokyo 107 Japan: Asian Productivity Organization. 1994.

(1) THE PROBLEM/ NEED	(2) PERFORMANCE METRIC	(3) PERFORMANCE UNIT	(4) AIMED VALUE	(4) DESIGN VARIABLES (specifications)	(5) DESIGN PERFORMANCE UNIT	(6) DESIGN AIMED VALUE
Colder air, more pressure and less energy consumption	Output air PRESSURE	Bar	6,5	Tolerance between screw lobules	um	8,0
				Screw velocity	RPM	3000
				Refrigerated air temperature	°C	2

Fig. 4.28 The performance variable 'increased air pressure' (taken from the table in Fig. 4.27) requires there to be at least three technical specifications for the product design. Each of these technical specifications has its own metric. Later, these variables and data will be used in the new product development program

Ulrich and Eppinger[4] have come up with a good guide for establishing design specifications:

– Specifications should be made up of dependent and independent variables. Dependent variables (e.g. the amount of tolerance between screws on the air compressor) afford more freedom to a product's subsequent design. Independent variables (e.g. the chemical composition of a component) do not.
– The specifications can be expressed in terms of target values: at least x, no more than x, between x and y, exactly x.
– The specifications should be practical. Metrics should be determined based on procedures and tools that are available.

A Discovery Team's Second Briefing with Company Executives. Final Prioritization of Findings

Continuing along the 'Discovery Team road map', once the DT has outlined the metrics that the customer requires, the next step is for them to present their findings to company executives during a second briefing session.

At this point, company directors will have a better understanding of the *customer economic benefits metric*, the desired *performance metric*, and (if possible) the *product design metric*. This will help them make a far more informed decision about whether or not a certain project should continue. There might be several reasons to discontinue a project, including: technical reasons (it may be impossible to develop the required technology), financial reasons (the company may not have sufficient resources to invest in this project), normative reasons (the potential design may not

[4] Product Design and Development, Fifth edition. Karl T. Ulrich and Steven D. Eppinger. McGraw Hill International Edition. 2012.

comply with current technical standards), logistics (there may not be a way to transport, handle, or store the product, among other reasons), or commercial (the market may not be very attractive for the company, or the product may not be very attractive for the customer).

In order to adequately discuss these findings and arrive at a conclusion, the commercial, operational, logistics, and financial officers, as well as the general manager should all be present for this meeting.

If, on the other hand, the development project is given the go-ahead, then the company will need to decide whether or not to include the new product in its Product Plan. For a more in-depth discussion on this topic, the reader can turn to Chap. 6.

Stage N°4. The Discovery Team's Role in New Product Development

Encouraging a culture of ongoing market research (and using a method such as the Discovery Team) can have some interesting side effects. Of these, one of the most compelling is the collaborative relationship that develops between a company's technical and marketing departments. In fact, it's a good idea for some of the Discovery Team members to be part of the product development team. This may happen naturally, since some of the Discovery Team members may very well be research and development personnel.

The product development team is there to do exactly what its name suggests: develop products. However, under no circumstances should upper management think that the marketing department and the research and development department are two separate 'stations' within a wider process. Both of these activities *are* the process.

If there's no collaboration between marketing projects and research and development projects, then this can (and frequently does) lead to some disastrous results:

- Development of products whose functionalities or attributes either exceed performance requirements, or fall short of them
- Development of products that are theoretically interesting, but in practice prove to be useless
- Development of products for nonexistent applications
- A risky new product introduction program
- A slow time to market for new products
- Distant and (increasingly) conflicted personal and professional relationships between members of both departments

Figure 4.29 shows the multidisciplinary nature of each of the programs that lead to a new product (Discovery Team, product development, and product introduction). Additionally, it shows that these programs need to be well-coordinated and well-timed, so that some programs start while others are finishing up. This will help speed up the whole process so that a product can be introduced into the market more quickly.

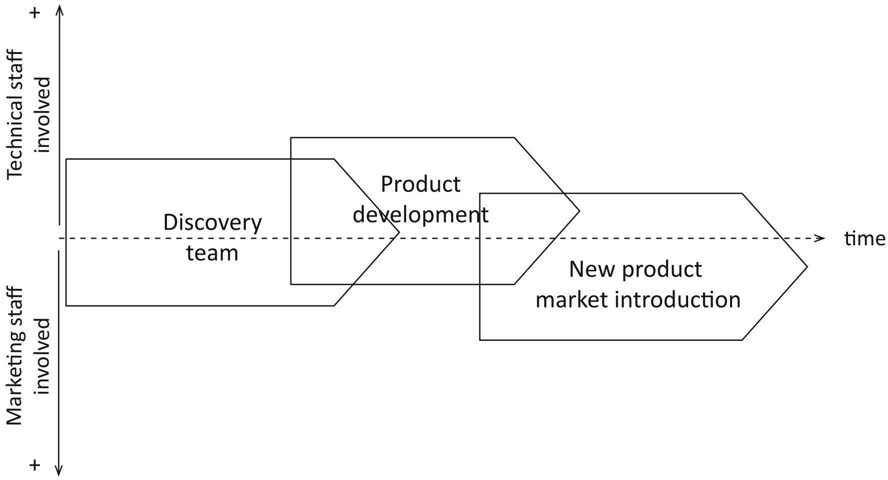

Fig. 4.29 This graph shows the three main programs that are part of new product development. Each of these programs should be run by a multidisciplinary group of people (e.g. marketers and engineers). These programs should be planned and executed in conjunction with one another so as to shorten a new product's time to market

Naturally, questions and complications inevitably come up during a product development project, and these will need to be cleared up with customers in the field. When this happens, a Discovery Team will need to resume its research at a customer's facilities and help develop a solution.

Conversely, the schema in Fig. 4.30 shows what tends to happen at the majority of companies. Quite frequently, a company's marketing and technical personnel (engineers, scientists, etc.) work separately from one another. This creates a 'silo' mentality within the company and it tends to have the effects mentioned above.

Stage N°5. The Discovery Team's Role in New Product Introduction

The fifth stage for a new technical product is introducing the product into its target market. As mentioned earlier, this stage can begin while the product development stage is still in progress.

Product introduction is just like product development: it requires a dedicated team of people with effective industrial marketing tools at their disposal.

Quite often, during the planning stages of new product introduction (see Chap. 12), questions arise that have to be cleared up with customers in the field. Here, the Discovery Team will once again resume their research activities. Ultimately, this research will be combined with other research that the Discovery Team does later on, once a product begins to be used for the first time by early adopters. Inevitably, any new product will experience some problems when it's applied by different

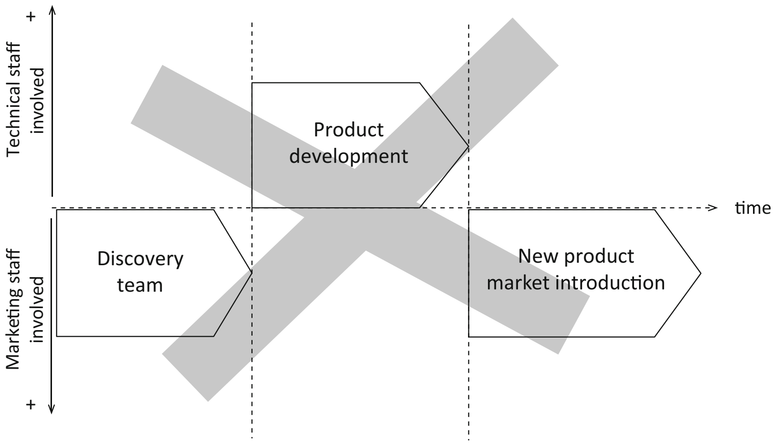

Fig. 4.30 This schema shows how these three programs (Discovery Team, Product Development, and Market Introduction) are usually, and erroneously, organized and timed. In this case, each functional department takes on exclusive responsibility for specific tasks. Here, there is no communication or coordination to run programs in conjunction with one another

customers. A company can learn invaluable lessons from these early users. Moreover, what they learn will give them a definite competitive edge over any unscrupulous and imitative competitors.

Stage N°6. The Discovery Team and Future Product Improvements

It's important to know the difference between initial modifications to a newly adopted product and research into future product improvements. During the sixth stage on the road map, a Discovery Team conducts follow-up field activities. The results of this follow-up will help a company develop new versions of a product or service. A company has to time its introduction program so that new versions of a product can rationally cannibalize older ones. To do this, a company needs to be able to predict imitators' behavior. Figure 4.31 shows the life cycles for different versions of the same technical product.

As will be discussed over the coming chapters, a Discovery Team's findings during the product usage stage will help create a virtuous cycle between a product's applications and the supplier company (see the 'triple A' cycle in Fig. 4.3).

In accordance with the concept of ongoing market research, a Discovery Team's activities help a company segment its industrial markets on an ongoing basis. Market research is just as energizing for a company as electricity is for a computer. Ongoing market research fosters a certain kind of corporate culture, culture creates habits, and these habits have to be maintained and kept in line.

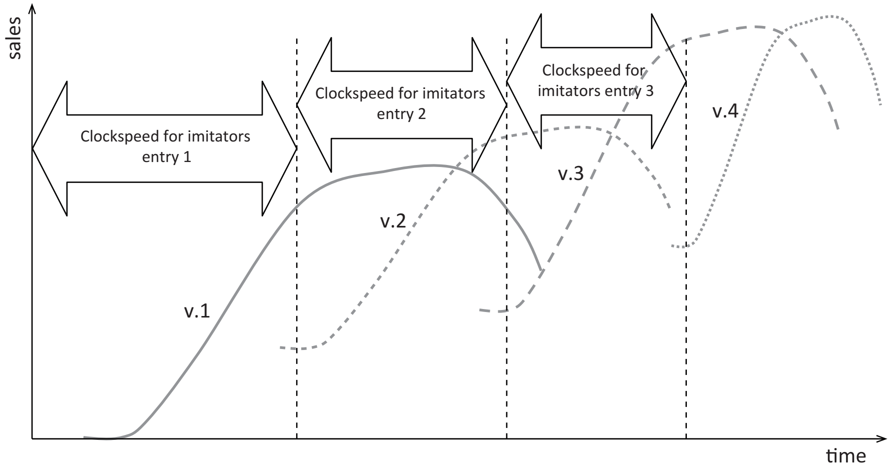

Fig. 4.31 V.1, v.2, v.3, and v.4 represent the follow-up activities for different versions of a product. The manufacturer uses their Discovery Team to conduct ongoing market research; this gives them new ideas for designing and developing new versions of a product. Market research, product development, and product introduction need to be done strategically. That way, a company can coordinate its introduction program so that new versions of a product cannibalize the old ones

Perhaps some day in the near future, senior executives will stop demanding their month-to-month reports and financial audits and, instead, will require that this kind of corporate culture be maintained and fostered within the company. If this doesn't happen, companies will continue to live under the 'make and sell' paradigm, which is a terrible thing to teach employees and ultimately creates a great deal of customer dissatisfaction.

Industrial Market Segmentation

5

Introduction

It's surprising to think that even today, authoritative business literature still endorses the idea that market segmentation should be based around customer purchasing behavior.

As discussed in previous chapters, *customer purchasing behavior* shouldn't be confused with *customer behavior*. In a market segmentation program, customer purchasing behavior is relevant to a company's sales plan. In contrast, customer behavior (understood as a customer's use and experience of a product over time) is relevant to product/service design.

This very simple difference helps explain why small industrial companies are currently eating up the market niche by niche, and taking it away from larger, multinational, and more established companies.

As will be discussed below, industrial market segmentation is about analyzing and choosing suitable applications in which a company's products deliver more in-use benefits for customers. Arguably, it is one of the most important things that a company establishes in its business strategy. Yet, despite its importance, companies often segment their markets without stopping to consider what their segmentation objectives are, or which specific markets they would like their business to operate in. It would seem as if a lot of companies segment their markets purely because their books and marketing courses have told them to.

For instance, most industrial companies that segment their markets without a clear understanding of what their objectives are, tend to do so for three reasons:

1. To create a 'mind map' of their markets.
2. To make more efficient use of the company's internal resources.
3. To group customers according to their *purchasing behavior*.

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_5

As justifications for market segmentation, none of these reasons has the potential to impact on a company in a significant or long-lasting way.

In the first instance (in which a company creates a 'mind map'), company executives know about their organization's market segmentation, but they don't act upon it—their knowledge never materializes in projects to improve a product and benefit customers. In other words, it doesn't lead to anything. It's just something that's *nice to know*.

As a result of this inaction, the company offers the same generic product for several different market applications.

In the second instance, a company uses market segmentation as a way to take advantage of its own resources: the company intentionally creates market groups that match up with the company's own internal structures and systems. For instance, if a company's plants are spread out over different geographic regions, it might attempt to segment its markets according to where each of these plants is located. Or, if a supplier buys business management software (ERP) that 'structures' its business in a certain way, it may try to segment its market so that it corresponds with the ERP model. All in all, customers receive very few benefits when a company segments its markets according to its own resources.

Finally, in the third case, companies that divide up their customers according to their *purchasing behavior* tend to focus on variables such as purchase volume, customers' price-sensitivity, purchase frequency, etc. The limitations to this kind of market segmentation mean that a supplier is reduced to looking at customers' past economic performance. These types of variables arise within a 'sales culture' (in which the company 'stocks' the market with goods) and completely overlook customers' more significant needs (including customers that a company is most interested in benefiting, e.g. customers that make large-volume purchases). The supplier, obsessed with increasing sales volume, will start to offer all sorts of other incentives: discounts on bulk purchases, complementary services, liberal payment terms, etc.

A company whose market segmentation is based on standard industrial classifications (known as SIC in the United States) likewise falls into this third category of 'purchasing behavior'-type thinking. Effectively, the company is oblivious to the deeper reasons that explain why different customer industries buy different products.

On top of this, these companies' competitors are probably using the same kind of criteria to segment their own markets. In which case, the idea that "market segmentation is a way to specialize an offering for attractive segments" simply doesn't hold up.

These last two types of segmentation (in which a company segments its market *solely* based on purchasing behavior or resource efficiency) will be referred to as 'reactive segmentation'. The idea behind this name is that, in either case, suppliers tend to act tactically in order to increase sales of their current offering.

For instance, a supplier that segments customers based on purchase volume will probably adjust its operations, services, sales, and logistics to better accommodate large-volume buyers.

Yet, for the end-user, nothing will have changed; both the product and its performance will remain exactly the same.

This path is cheaper and easier, and it may even increase a supplier's short-term sales. However, it's important to realize that it won't produce any significant or long-lasting competitive advantage. Odds are, competitors will also have their eyes on these large-volume buyers, and they'll be willing to shell out their own handful of tactical benefits. Ultimately, these guerrilla sales tactics end up creating a contentious environment: companies wage war against one another through prices, logistically and operationally complex offers, or through very unprofitable business ventures.

Why Should Industrial Companies Segment Their Customers?

A company may have several objectives for conducting market segmentation; however, underlying all of these, a company should always be aiming to benefit the *end-user*. Suppliers need to fully understood this and put it into practice before they can expect to receive benefits from their segmentation program.

Well-executed market segmentation has positive side effects for both parties:

– **An organized and clearly defined product portfolio**. This is especially important for companies that manufacture, or offer, several different products in several different markets. Without clearly-defined target applications (and the coordination this provides), then rationalizing product lines and figuring out how to efficiently get a product onto the market can turn into a nightmare. Consequently, without product/service rationalization, target customers won't have access to improved products and the corresponding technical consultations.
– **A focus on products that fit the target market**. Without a clear focus, both parties suffer (both supplier and customer). The supplier suffers because they depend on market requests for their product, yet have no prior knowledge of which technical designs best suit their customers. Meanwhile, customers also suffer: an unfocused supplier won't be able to anticipate their needs and performance requirements for a product.
– **More in-depth specialization of product functionalities**. As will be discussed below, proper market segmentation and the development of niche markets means that a supplier can specialize its products according to concepts such as product functionality and the six different types of product attributes (see Chap. 2). In turn, using these concepts help a manufacturer understand why these products are preferred and adopted (see below).
– **Organizational specialization within a supplier's company**. Once a supplier has established what its niche markets are, it will need to specialize its organizational structure. This kind of specialization is far more significant. It involves specializing the relationship between a supplier's *offering* and a target customer's *need*. It's no longer a question of specialized sales personnel, but of

highly technical professionals that deepen their knowledge of a product's functionalities.

- **It encourages the development and introduction of successful products**. The combination of the above two points (that is, a supplier's specialization in niche markets, and its specialization of product functionalities) essentially guarantee that a supplier will *continually adapt* its products to meet customers' needs.
- **Well-designed logistics channels**. As will be discussed shortly, proper market segmentation hinges on a supplier's understanding of its end-users. Once a supplier understands who its end-users are, it will be able to determine which logistics and distribution channels are best suited to them. Methodologically speaking, proper market segmentation should begin with the end-user. Having done so, a company can proceed to design or assemble the rest of the industrial chain.

Only once this has been accomplished (and customers have been grouped according to specific applications), can a supplier begin to segment customers according to purchasing behavior.

Segmenting Industrial Markets Based on Product/Service Application

Most likely, the reader will have realized that there's a very close relationship between industrial market segmentation and technical product design. This comes into even greater focus when we consider that for industrial markets, true customer orientation is about using the right technology to solve a customer's problem or challenge. And, remember: the fundamental reason behind any business transaction between a customer and a supplier is that a product or service is bought *in order to be used and solve a problem*. Product use is what sets the entire industrial chain in motion, regardless of how many intermediaries (e.g. distributors, dealers, etc.) exist along the way.

For readers schooled in consumer or retail marketing, the concept of COP (customer orientation through the product) might seem counter-intuitive (see Chap. 2). Oftentimes, in retail markets, the psychological effects of *ownership* are the main reason why consumers want to purchase a product. As such, retail market segmentation programs tend to focus on consumers' buying habits, psychological profile, and demographics.

Conversely, an industrial customer buys a technical product to solve a specific problem, the benefits of which should be measured and demonstrated.

As a result, a company's industrial marketer needs to figure out which product design corresponds with which market application. Naturally, this type of exploration requires a dedicated methodology, such as the Discovery Team© (see Chap. 4).

When a particular product/service is used for a specific market application, a very common phenomenon occurs, one that's helpful for an industrial marketer: *market applications are dynamic and they change over time*.

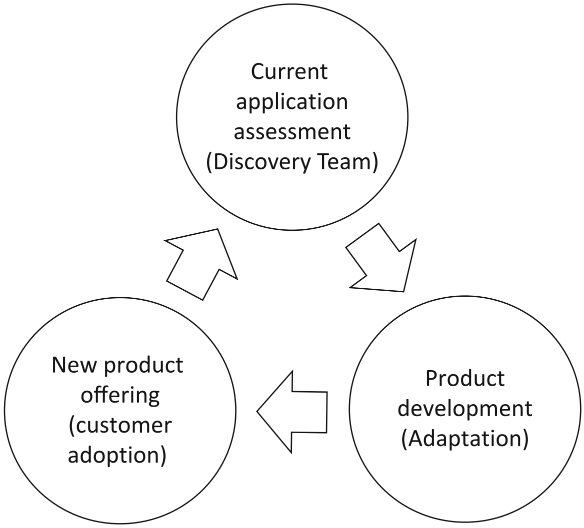

Fig. 5.1 The AAA cycle of industrial market segmentation. This cycle consists of three ongoing, interdependent activities. Together, these activities encourage ongoing product-application specialization. An industrial marketer should not only implement this cycle, but also expand, organize and prioritize the applications their company will focus on

For instance, as time passes, the customer starts to acquire new technology that in some way impacts upon a supplier's product design. Or, a product may be subjected to environmental conditions that are different from what the supplier originally envisaged.

Likewise, different end-users may use a product in different ways depending on the context. Or, an end-user may benefit from a product in a way the supplier hadn't planned for or anticipated. Whatever the case may be, a supplier should realize that this dynamism, or evolution, in product application is actually an *opportunity*. In order to take advantage of it, a supplier needs to consistently explore its markets and adapt its products.

Any industrial marketer that classifies market applications, offers specific product designs for target applications, continually explores market applications, and adapts the company's product portfolio, is actually carrying out a very profound, consistent, and proactive form of industrial market segmentation.

What this means, is that the industrial marketer is basically letting the market (*dynamic applications*) *segment itself*. Here, the role of a proactive industrial marketer is to follow these applications, and find new undiscovered ones. The key here is to detect and tag niches using an appropriate definition.

This cycle of application-adaptation-adoption can be referred to as the AAA cyclical model of industrial market segmentation. It is represented in Fig. 5.1.

In order to keep track of which product designs are specialized for different applications, a company can use a product-application matrix such as the one used by the Discovery Team for market exploration (see Chap. 4). Figure 5.2 provides an example of a product-application matrix.

The product-application matrix should evolve over time. The nature of this change depends on how well a company understands and implements the AAA cycle. For the most part, progressive companies tend to discover more and more

Fig. 5.2 The product-application matrix. This is a tool for organizing different products, designs, or different versions of a product according to market application. The matrix shown here is a simplified version. An industrial marketing strategist would need to add information to each cell in this grid, such as functionality metrics, attributes, and expected performance level

applications for their technologies and develop a number of specialized product designs. When this happens, the product-application matrix becomes quite useful—a company can use it to decide which market applications are worth their effort and dedication.

When industrial companies allow the AAA cycle to take its course, sooner or later, they have to ask themselves the following question: given the direction that market applications are headed, what are our products evolving towards?

In order to capture these trends, companies can use the concepts of product functionality and the six types of product attributes (see Chap. 2).

By identifying the functionality(ies)/attributes that are required for each application, a company can organize, prioritize, and develop its technological core competences.[1] This gives logic and focus to a company's development programs.

As a technical product evolves to better perform a functionality, companies can build up their core competences while developing new attributes (such as, *performance enhancing*, *self-protection*, *cost reduction* attributes etc.). Likewise, companies can also build up core competences by developing new functionalities.

For instance, a new version of a robot that performs quality control tests can continue to offer the functionality "provide product samples" while improving an attribute such as "speed of its vertical and horizontal movements."

If an industrial marketer is aware of these technical improvements, he/she can look for new applications that require the new robot's vertical and horizontal speed.

Awareness of improved attributes, or new attributes and functionalities, is what allows the AAA cycle to continue benefiting customers. Likewise, it also deepens a

[1] The Core Competence of the Corporation. C.K. Prahalad and Gary Hamel. HBR, May-June 1990.

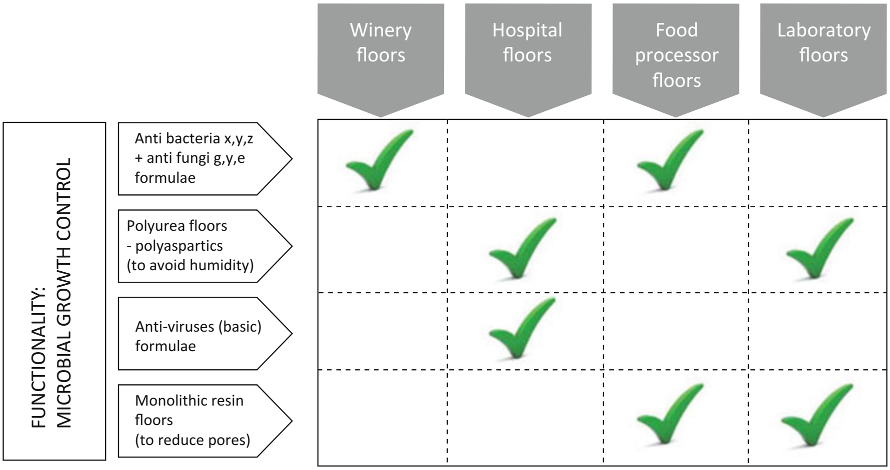

Fig. 5.3 In this product-application matrix, the products have been specialized to provide the functionality 'control microbial growth'. A company may have several different matrices for different products and applications and different functionalities required by customers. Matrices can also be based around attributes that a company wants to develop (e.g. resistance, duration, etc)

company's core competences. Or, put another way, the AAA cycle ensures that a company's specialization goes two ways. On the one hand, a company's specialization is directed *outwards* towards market applications; and on the other, it's directed *inwards* towards developing the company's technological core competences.

Correctly stating a product's functionalities or attributes can be hard. Suppliers can ask, 'what is this product used for?' to identify product functionalities and, 'why is this product used?' to identify product attributes.

A company can also use the product-application matrix for its outwards and inwards specialization (discussed above). In this case, the industrial marketer should organize products and applications according to required functionalities or attributes. This is shown in Fig. 5.3.

On occasion, customers buy and use products for a functionality that the manufacturer is unaware of and hasn't stated; in these kinds of situations, the product is probably already performing the functionality at some basic level. Otherwise, it wouldn't have been adopted. The same phenomenon might be true of a company's competitors: their product might meet an end-user's basic performance requirements even if they (the competitor) is none the wiser. As a result, the difference between how well these two products perform is determined by the nature and performance of their attributes.

Notwithstanding the above, an industrial company should be aware of their product's functionalities and state them. The discovery of a new functionality for new applications can have profound and long-lasting repercussions for a company's business strategy and future.

In practice, whoever is conducting industrial market exploration should already be familiar with a product's functionalities and attributes; this will help them find new, potential applications for the product. And, interestingly enough, having *a priori* knowledge of a product's market applications will help this person conceptualize and determine what kind of functionalities and attributes customers need.

Industrial Market Segmentation Based on Customer Purchasing Behavior

Before all else, an industrial supplier needs to have fully understood and segmented its markets according to product application. Only then can a supplier take each group of target application customers and segment them based on purchasing behavior.

These customers should belong to the target application market, regardless of whether they're end-users or intermediaries.

This suggests that customers within a single market application can have different types of purchasing behavior, and consequently, may make high or low-volume purchases.

Differences in purchasing behavior may be due to each company's paradigms, organizational culture, the characteristics of their own target market segments (thus, their own segmentation approach), or their financial situation. When segmenting customers according to purchasing behavior, a supplier may want to consider some of the following variables:

1. Sensitivity to services
2. Price-sensitivity and sensitivity to payment terms
3. A customer's willingness to take on certain risks when adopting a product
4. Potential purchase volume
5. How bureaucratic or complex the buying process is

The effects these variables have on customers' purchasing behavior can influence the price of an offering, how long it takes a sale to go through, payment terms, or the complexity and cost of complementary services.

These variables can help a company prioritize its relationships with certain customers. This is true regardless of whether the buyer (the one paying the company's invoices) is an end-user or an intermediary with purchasing power (e.g. distributors, contractors, integrators, etc.).

Because of this duality in industrial market segmentation, an industrial marketer may encounter some interesting phenomena. On the one hand, there's the end-user, and the other, there are intermediaries. The two of them don't always coordinate with one another. Or, worse still, these two parties (end-users and intermediaries) may even have contradictory interests with regards to a supplier's product.

Whatever the case may be, an industrial marketer has to understand that the 'targeting' stage in a segmentation program is about targeting user applications. Once

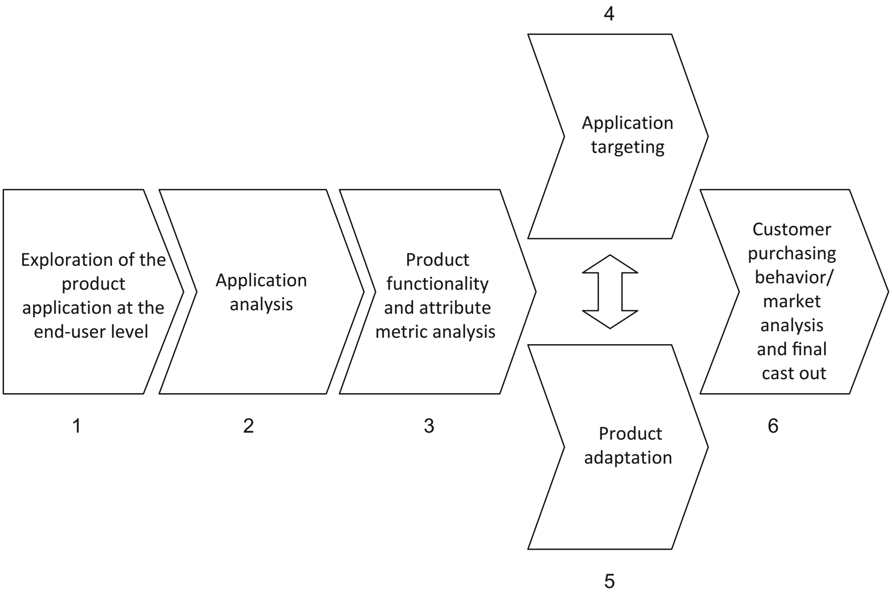

Fig. 5.4 This volume proposes a general model of industrial market segmentation. This model consists of six stages, including: segmentation according to product application (Stage 4), and segmentation according to the purchasing behavior (Stage 6). Segmentation according to application means that a supplier has to constantly reexamine functionality and attributes performance. Stages 4 and 5 are mutually iterative, meaning that application targeting and product adaptation (or, product development) are done together. This iteration exists because in order for a company to properly target an application, a product has to be shown to clearly resolve the application's problem/need

customers are grouped according to application, then segmenting them according to purchasing behavior will help a company figure out the conditions customers' need for purchasing a product/service. In other words, a supplier-manufacturer has to be prepared to adjust its offer so that it fits the needs of a large portion of its target application customers. Otherwise, it could end up with a market that's too small, making its target application impractical.

The Overall Process of Industrial Market Segmentation

As recommended in this chapter, industrial market segmentation should be carried out sequentially in the order of 'product application + customer purchasing behavior'. The diagram in Fig. 5.4 illustrates a general process of market segmentation; this diagram includes elements of the AAA cycle discussed above.

For a company, the purpose of focusing on these two factors (application and purchasing behavior) is twofold: it ensures that the company is focusing on strategically important product use, and on the other, it facilitates the purchasing process (both in terms of time and profitability).

Below, the reader will find a step-by-step description of each stage in the market segmentation process.

Stage N°1. Exploring Product Applications at the End-User Level

Step One: Choose a Specific Product to Start the Segmentation Program

Given the close relationship between a product's design and its market application, the first thing a company needs to do is choose a specific product to kick-start the segmentation program.

In practice, some companies make the mistake of segmenting markets for the entire business unit. This can cause immense confusion, and it can turn into a huge headache (and mental scramble) for marketers.

A classic example of confusing market segmentation is when a company segments its market according to members' roles in the downstream industrial chain: that is, by grouping together distributors, integrators, contractors, etc., into "segments". Oftentimes, these companies characterize each stage in the chain and explore its needs, only to end up providing generic offers to purchasing agents.

A company can now adapt its offering to each stage in the industrial chain once it has analyzed a product's user applications and chosen a target application for each product design.

Ideally, a company should begin by choosing and working with a single product. Figure 5.5 provides three examples of products that were chosen to kick-start the market segmentation process.

For companies that only manufacture or offer a single product, choosing a product to kick-start the segmentation program is straightforward. Segmentation programs that are required to start off this way are more time-efficient for industrial marketers. Sooner or later, companies that start off with a generic product definition are forced to define their product more precisely.

IDENTIFICATION OF PRODUCT OF CHOICE TO BEGIN THE SEGMENTATION PROCESS	
INCORRECT	**CORRECT**
Steel products	Concrete reinforcement bar
Epoxy coatings	Revep 30:Epoxy thixotropic coating
Industrial cables	SHD-GC cable with EPDM isolation

Fig. 5.5 A business unit should choose and identify one product at a time in order to explore that products' market applications. The left column provides examples of poorly identified products, where the product definition is far too broad (e.g. a generic definition, or a product that's defined according to business unit). The right column provides examples of correctly defined products, where the product definition is more precise

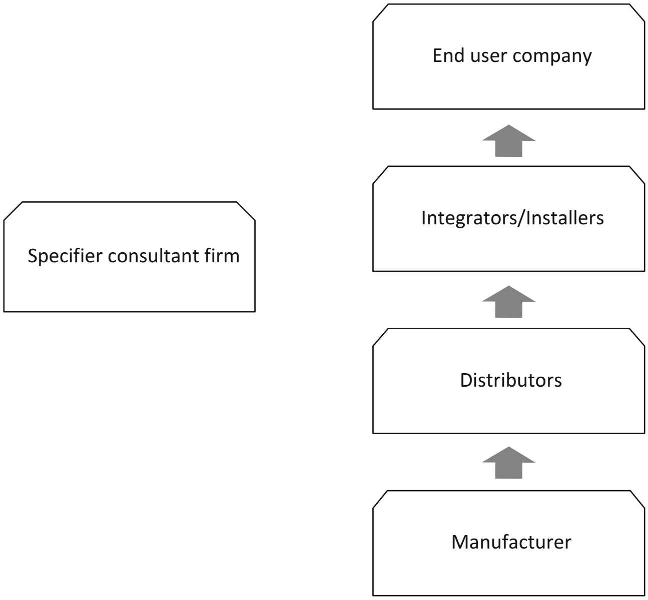

Fig. 5.6 Example of a generic industrial chain. Here, the supplier (manufacturer) is the one that initiates the market segmentation program. The supplier's product may or may not go through intermediaries before being sold to the end-user. Parallel to this, an industrial chain is also composed of other entities that determine a product's technical specifications (these may be technical specifications that affect it during its intermediate stage, or its usage stage)

Identify and Diagram a Product's Industrial Chain from Manufacturer to End-User

Next, a supplier should draw a diagram of the chosen product's industrial chain (that is, of all the entities that a product physically has to go through before arriving at the end-user). An example of one such diagram is provided in Fig. 5.6.

Naturally, industrial chains vary depending on each product. Some chains may be longer, others shorter—it all depends on where the supplier is located along the industrial chain. Some may be very complex (insofar as the number or the nature of participants), while others may be quite simple. In order to create a diagram, a supplier should draw themselves at the base of the chain and should put the end-user at the very top (in this case, the end-user is defined as the entity that has physical ownership of the product and lives with it).

In between these two points are all the entities that a product has to physically go through before being *put to use* (e.g. distributors, assemblers, integrators, etc.). These entities are the middlemen between a manufacturer and the end-user and can be referred to as 'intermediaries'.

Quite often, supply chains include firms that specialize in engineering consultancy (firms that determine a product's technical specifications).

For example, the technical characteristics of a steel bridge are designed by such engineering firms. These firms are responsible for the conceptual, basic and detailed aspects of a capital expenditure project (Capex).

Some suppliers diagram an industrial chain for each product in their product portfolio, while others only do so for each product line.

Meanwhile, still other suppliers begin by identifying their end-user's industry and from there they assemble the rest of the industrial chain.

The amount of detail that goes into this diagram depends on the strategic value of the industrial chain.

For example, when developing and introducing a new technical product, a company's development and product introduction teams will need to determine the best possible logistics channel for the new product. Here, they'll want to be as detailed as possible.

So, why is the industrial chain important for an industrial market segmentation program?

By creating and studying an industrial chain diagram, a supplier learns about markets that exist beyond their direct customers (be these distributors, assemblers, integrators, or some other type of intermediary). It's absolutely essential that industrial marketers know how to see beyond their company's direct customers. If they can't, then suppliers frequently get fixated on customers that aren't end-users but that have significant bargaining power. In some markets, the wholesale, integration, and distribution stages are dominated by just a few, very large companies; these companies are able to pressure suppliers on their offering's price and conditions. And, because these suppliers are fixated on large-volume sales, they tend to capitulate to demands.

Odds are, companies that ignore the finer details of their products' downstream industrial chains are trapped in a vicious and short-term cycle of low prices and sales volume.

As will be discussed below, proper industrial market segmentation is based on the idea that the end-user is the most important customer.

Identify and Characterize a Product's End-User

In order for an industrial company to properly segment its markets, it's absolutely crucial that the company identify and analyze their product's end-users. The reason for this is simple: proactive industrial market segmentation is about identifying specific *end-user* applications.

Many companies don't usually relate to or deal with the end-user, and as a result, they see the end-user as distant, fragmented or abstract. Yet, these companies are still faced with an indisputable fact: end-users are the ones that *use* products that were designed and manufactured upstream on the supply chain, and odds are, end-users will *live* with the product for a significant amount of time.

The end-user is the reason the entire industrial chain exists. This includes anything the industrial chain encompasses: distribution, integration, assembly, technical specification, and manufacturing. Even for ingredient or component products, the end-user is the real customer, the most important one.

The end-user and the product are very closely intertwined, and both of them are key to an industrial manufacturer's business strategy. Put another way, it doesn't matter if a company manufactures raw materials, components, equipment, machinery or services—no matter what, the one thing that connects a company to its end-user is the product itself.

Thus, a manufacturer needs to identify these customers and visit them using an exploratory research approach (see the Discovery Team method in Chap. 4). Technically speaking, the aim of these visits is to discover a product's applications (both new and old), fully understand how or why a product is needed and used, and which product adaptations are necessary.

Stage N°2. Analyzing Product Applications

The second stage of industrial market segmentation consists of in-field exploration and analysis of a product or technology's application.

Identify a Product's Application

The 'application' of a technical product refers to who uses the product, what it's for, where it's used, or when (see explanation below). It can also be described as the combination of these four variables. In an industrial context, the term 'application' can be used in place of the term 'market segment' (which is widely used in consumer marketing).

'What the product is used on/for' refers to the material that the product interacts with (e.g. operation/machinery/element). For instance: XYZ floor coating used for uneven or contaminated concrete slabs, or a valve used for semi-solid fluids.

'Who uses the product' generally refers to the type of person that uses the product (assuming the industrial product is used by a person). For example: ergonomic chairs used by personnel at a call center.

The importance of 'what it's used on/for' and 'who uses the product' is directly tied to a product's functional design, and to any attributes that either support or protect the product's functionality (see below).

'Where it's used' generally refers to the physical place where a product is used. This is important because it reflects the environmental conditions that affect a product during its service life; these are things that a supplier needs to be mindful of in order to make sure that a product is going to perform properly. For instance, an SHD-GC electrical cable delivers electricity to cranes that are used to excavate minerals in strip mining operations. This description of the product's application includes 'what it's for' (mining cranes) and 'where' (strip mining operations).

'When' has to do with the timing of a product's use. For instance, a particular product design may provide the most benefits when it's used during a customer's nighttime operations. Or, it may be most beneficial at critical moments when there's been a power failure.

During the second stage of an industrial market segmentation program, a Discovery Team should visit as many end-users as possible (these are the customers that use the product or technology). It's important to comprehensively explore products' market applications and keep a careful record of where findings come from. This avoids any confusion about the requirements for each application. Otherwise, a company runs the risk of designing haphazard offerings that either exceed or fail to meet requirements. If manufacturers have developed several products within a given product category (e.g. industrial floor coatings), this is a good opportunity for them to create a data sheet in which they organize their products according to application, such as in the product-application matrix in Fig. 5.3.

Describe Product Applications

A company's description of a product's application should be as precise as possible. Company executives should avoid generic descriptions of applications, e.g. "our SHD-GC cables provide electricity to heavy machinery."

In the above example, the description of product application is far too generic ('heavy machinery'). This limits a company's ability to identify technical specifications for proper product development. The company won't be able to achieve its goal of specializing the product for its application.

Designating a name for a new application is not trivial, but the effort is worthy to be considered one of the most insightful tasks in a company's strategic process. The marketer should consider that newly found application already exists. It is just that no one has named it or addressed with a solution.

The product-application matrix from Fig. 5.3 can also include information about the risks involved in each type of application. Each cell of the product-application matrix can include information such as:

- Whether a product requires extensive, or resource-intensive, intermediate channels. For instance, some applications may require a company to design and implement a distribution system, regional offices, product integration or assembly.
- A product's sales potential. This can be expressed as a monetary amount or projected unit sales.
- Past sales performance in the local economy
- The strength or presence of competition or substitutes
- Any imitative competition with a presence in the local market
- Cross-selling potential with other company products
- Any social/political/economic risks in the local market

Just how specific can a niche market application get?

Through extensive and detailed market exploration, a supplier might discover that different customers with different industrial operations are using a product in different ways. This gives the supplier an opportunity to specialize their offering (into super-niche markets). Ultimately however, the supplier's interest in specializing their products will depend on an application's sales potential.

For instance, there are some types of applications that are very rare (e.g. the external surface on a space shuttle) and as result, very few customers will end up using the new product. This tends to happen in industries where customer companies are constantly developing radically new products or in industries dominated by a few monopolistic companies. Yet, these customers eventually set trends that use a technology on a wider base.

There are two types of manufacturers for whom finding out about their products' specific applications poses a real challenge: manufacturers that offer the same product/service design for several different (and unknown) applications, and manufacturers that offer several products within the same product category.

Manufacturers that offer a single, generic product will have to explore a greater amount of applications. In B2B literature, these types of generic products are known as 'vanilla products'.[2] An industrial marketer should avoid using a 'vanilla strategy' with their technical product. A vanilla strategy means that a manufacturer offers a single product design for several different applications, when in reality, each of these applications would benefit from a more specialized product. Naturally, if a company doesn't specialize its products, sooner or later their competitors or a substitute will.

Stage N°3. What's Required of a Product? Assessing a Product's Functionalities and Attributes

In previous chapters the reader observed that in order to understand end-users' needs, a company has to understand a product's functionality. A product's functionality is a statement that describes the benefit that a product provides. Functionality is the *product of a product*.

These chapters also discussed the fact that it's not always easy to come up with a functionality statement, especially when a company is unfamiliar with a product's functionalities. For a more detailed discussion on how to create a functionality statement, the reader should refer to Chap. 3.

Quite often, companies don't know what functionality or attributes are required of their product until the Discovery Team brings this information to their attention through field observation. This is particularly true of manufacturers that offer vanilla products for a wide range of applications. It's also true of suppliers that sell specialized products but are unaware of their product's current (or potential) functionalities.

[2] N.A. This term was proposed by James A. Anderson and James Narus in their book, *Business Marketing Management*. Prentice Hall. 1999.

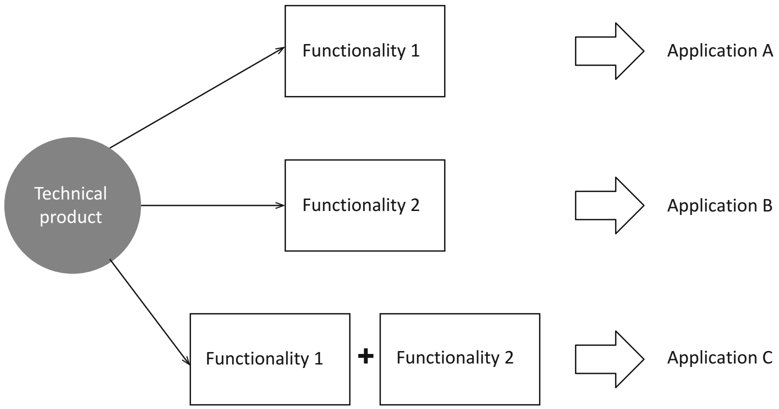

Fig. 5.7 A technical product with two different functionalities. Different market applications may require the product to perform each function separately, or they may require it to perform both of these functions at once. These applications take place at the end-user level

Products That Provide Multiple Functionalities Per Application

A technical product may have one, two, or more functionalities. However, too many functionalities and the product could become too complex or expensive for certain applications. In Fig. 5.7, the product provides functionality 1 for one specific application and functionality 2 for another specific application. Meanwhile, the product is used in a third market application that requires functionalities 1 and 2.

An electrical conductor is a good example of a product that's used for different applications, each of which requires different benefits from the product design. An electrical conductor's first functionality might be to 'deliver electricity', and it's second functionality might be to 'transmit information' between equipment and production control.

These kinds of discoveries give suppliers the opportunity to specialize their product design for each application. Doing so could increase the economic benefits of using the product and improve the product's functionality performance.

Companies can also use a product's *attributes* to segment product applications. Some technical products have a basic and transversal functionality that is used in various applications (e.g. an electrical conductor whose functionality is to 'deliver electricity'). In these kinds of situations, different applications may require different kinds of product attributes (this includes any of the six types of attributes related to product use: *performance enhancing*, *self-protection*, *cost reduction*, *usability*, *intermediation*, *or externalities*). This is shown in Fig. 5.8.

If a company decides to transfer new product attributes into a given category (meaning, of course, that these attributes will affect various applications), then they'll potentially benefit a large number of customers. In fact, doing so can more

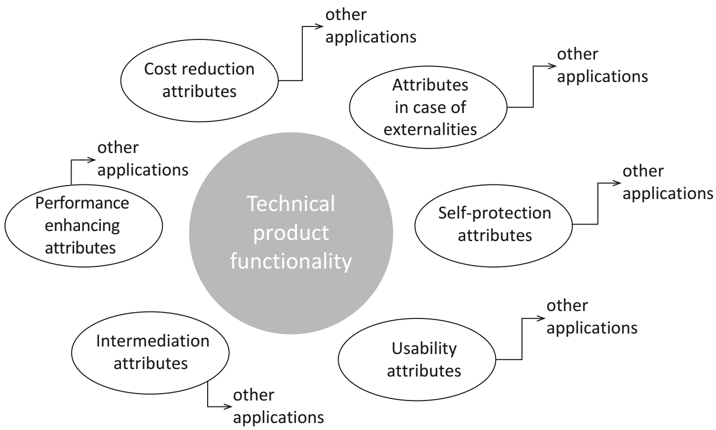

Fig. 5.8 By improving any of the six types of attributes shown above (all of which relate to product use), companies can adapt a product for use in new market applications

beneficial to customers than if the company had decided to augment the product's functionality.

For instance, an electrical conductor might have a *performance enhancing attribute* that reduces voltage drop along the length of the cable. Something this revolutionary would affect various product lines, and by extension, various applications.

Or, in another example, an electrical enclosure might have an anti-corrosive *self-protection attribute*. A company can use this attribute in products that are going to be installed in corrosive environments (e.g. contaminated environments, maritime environments, etc.).

Or, a factory is supported by a metallic structure that is flame retardant (*attribute in case of externalities*). In this instance, the new technology could be used in applications where metallic structures were once prohibited since they might have collapsed in the event of a fire.

Or, a manufacturer might substitute a more costly ingredient for a cheaper one without diminishing the performance of the finished product (*cost reduction attribute*). Once again, this type of improvement can be used in other product lines, thus allowing a company to penetrate new markets that, due to price constraints, weren't available to them in the past.

Or, a crane's motion controller might have a well-designed graphic interface. This kind of *usability attribute* could be used for other product designs in order to improve user experience.

The more market applications a supplier studies, the more they'll find that different applications require different functionalities or attributes. This kind of phenomenon is very common with technical products, and is especially common for ingredient and component products.

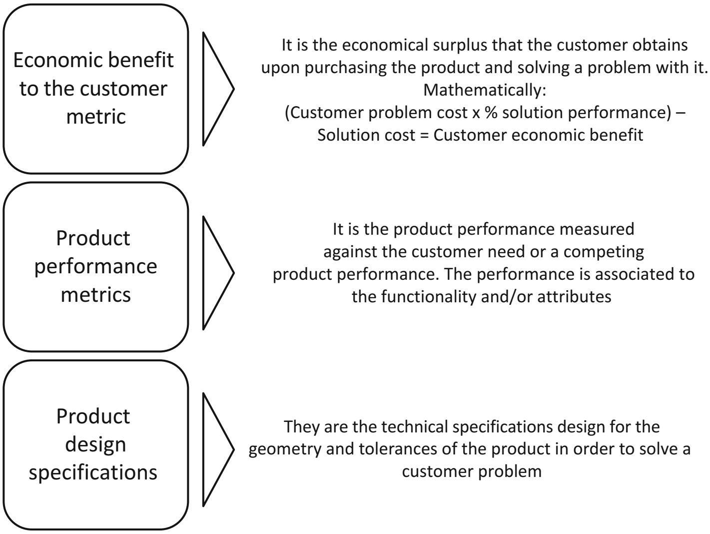

Fig. 5.9 These three metrics can be used to analyze market applications that might require a new or improved product. During market exploration, the Discovery Team works with end-users to gather information for these metrics. At the same time, it should also gather similar information about the performance of competing or substitute products

Determine a Product's Functionality and Attribute Metrics

Key to this third stage is identifying the right functionality and attribute metrics for each application.

Initially, a company can get enough information just by exploring its product's end-users. Then, once a company has decided which application to target, it can begin exploring the metric needs of intermediaries along the industrial chain.

Chapter 4 described the functionality and attributes metrics. The Discovery Team method explores three types of metrics: the economic benefits to the customer metric (EBM), the functionality and attribute performance metric (PPM), and the design metric (PDM). This is shown in Fig. 5.9.

With a market exploration team such as the Discovery Team, companies can gather a lot of this information early on, when the product development program is still in its initial stages. This saves a company time and money. For a company, these metrics offer a good starting point—from there, a company can make more informed decisions about which product adaptations to pursue or which applications to target in the future.

Given the significance of these findings, it's very important that they get recorded in the product-application matrix. Figure 5.10 provides a simplified version of this matrix. Here, the Discovery Team has recorded each product's functionality performance (the products are listed on the left-hand side) and has determined what

Fig. 5.10 This matrix shows each product's metric performance when used for different applications. Not included in this matrix is information about competing products or substitutes. Without this kind of information, a company can't make decisions about the potential success of their own product. 0% performance means that a product is totally unsuitable for an application. 180% performance means that a product exceeds the requirements for an application

percentage of an application's problem each product is able to solve. A company should refrain from reaching any conclusions about a product's performance before they've established a benchmark amount to compare it to (this should be based off of a competitor's product, or the closest substitute). Solving 30% of a customer's problem may seem far from ideal; however, if a competitor's product solves 20% of the problem, customers will probably choose that product regardless. Naturally, there are other factors that customers look at that influence their decision to adopt one product over another, such as a product's price, availability, ease of integration, after-sales services, etc.

Each cell in the product-application matrix can include more detailed information on the performance requirements for an application, the current product's actual performance, and how these compare to the performance of a competitor's product. This is shown in Fig. 5.11.

Overall, a company can use the product-application matrix to get a better understanding of an application, their own offering, and a competitor's offering or substitute. Companies are encouraged to include any kind of information in this matrix that might help them make decisions in the future. These might be decisions about product development, product improvements, which market applications to pursue, or which ones to abandon. Consequently, the product-application matrix should be treated as confidential. It is, after all, the result of a long, methodical, and informative process, and can be thought of as the backbone of a company's business strategy.

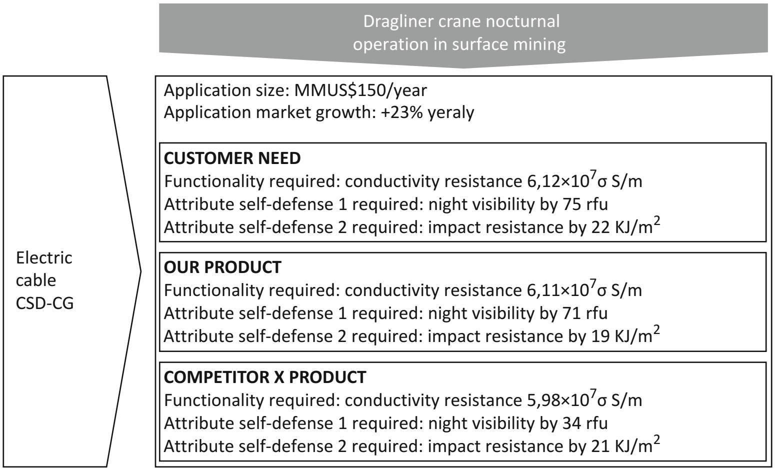

Fig. 5.11 A more detailed product-application matrix (one cell). Here, a customer's requirements for a product are compared to the real performance of both a company's and a competitor's product. This matrix includes information such as: the product's economic benefits metric, functionality/attribute performance metrics, and any other information that can help a company improve its product and target specific applications

Stage N°4. Targeting Market Applications

The fourth and fifth stages of an industrial market segmentation program are iterative and mutually-dependent. A company only progresses past these stages once they've improved a product (or developed a new product/service) to the point that it satisfactorily resolves a customer's problem/need. In other words, an industrial marketing team may think that a certain product is right for a certain application; however, if the product fails to meet the performance requirements for this application, team members may need to reconsider. This would mean reassessing the product's design, as well as its intended application.

When it comes to targeting market applications, a company's most important tool is its product-application matrix (see Figs. 5.3, 5.10 and 5.11). As a result of stages 2 and 3 in the market segmentation program, a company will have characterized all of the applications that could benefit from its product. Both the industrial marketing team as well as the Discovery Team need to have gauged the performance requirements for each application (also, they should avoid adding unnecessary attributes to a product simply because the R&D department has already developed them).

Only then can an industrial marketer record each product's real performance level for each application in the product-application matrix. For each application, there's bound to be performance gaps between the ideal, sought-after performance (of product functionality and attributes) and the product's actual performance.

As discussed previously, a company can get a more accurate picture of an application by including additional information in the product-application matrix. This could be information about how much intermediation an offering requires, or any potential risks. All told, this helps a company reassess the feasibility of a product improvement, adaptation, or new development project.

An industrial manufacturer may be wondering: just how specific should products be for each application?

The answer to this question deals with the most important aspect of a segmentation program: targeting.

Criteria a Company Needs to Consider When Targeting Market Applications

The product-application matrix serves as a good base for determining which application to target. Part of the 'application targeting' process involves assessing various factors associated with each application (these were described in detail in this chapter and previous ones). These factors include:

- A product's economic benefit to the customer (this is calculated using the desired performance level, a product's real performance level, and the price of a product).
- Any additional complications concerning distribution, integration, regulation, etc.
- The risk of doing business in the application's local market
- A company's ability and skill to develop products that resolve certain needs/problems.
- The cost/benefits of specializing a product for a given application.
- The need to provide products for several applications to ensure that customers don't end up cross-buying products from a company's competitors.
- Cost/benefits of pursuing new applications in situations where competitors have already specialized their products and have a competitive edge.
- Application size and projected market growth. This can be expressed in terms of sales or product units.
- Leverage from cross-selling (offering customers various, related product lines).

It's been well-established that companies should pursue a market application where they're bound to be the predominant market participant. Evidence shows that industrial companies with a 30 % market share manage to achieve functional profitability ratios, whereas companies with less than 15 % market share tend to lose money.[3]

To some extent, this helps explain the ongoing success of German *Mittelstand* companies. *Mittelstand* companies have primarily developed specialized technical/

[3] Marketing High Technology. An Insider's view. William H. Davidow. The Free Press, 1986.

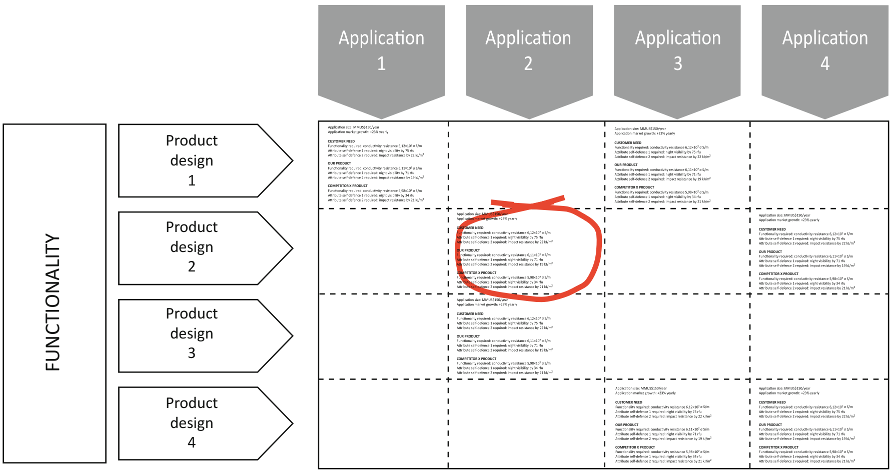

Fig. 5.12 After characterizing several market applications for each product design, a company will be able to choose a target application. This decision rests on several factors, such as: the strength and effectiveness of a product, its sales potential, the potential to become a market leader, and the difficulty of accessing or staying in a given market

industrial products that target specific applications. On average, *Mittelstand* companies have a 33 % share in global markets and a 38.4 % share in European markets—and, quite often, these businesses are leaders in their respective markets. Moreover, these companies' market share tends to greatly exceed that of their next strongest competitor.[4]

Given all of the above, 'targeting' is a decision that involves a wide range of factors. Factors such as: application needs, distribution channels, product performance and specialization, the potential to become a market leader, and any necessary promotional efforts. Only after a company has considered all of these factors can they reasonably make a decision about which applications to target from their product-application matrix. This is shown in Fig. 5.12.

Targeting Market Applications When a Company Has Several Related Product Lines

There's no limit to how many product-application matrices an industrial marketing team can create—they can outline as many as necessary depending on how many product lines a company is able to offer. Figure 5.13 shows an example of a consolidated product-application matrix. In matrices such as this one, it's best to reserve the vertical columns for product applications. That way, it's easier for an industrial marketer to visualize which products can be used for the same application.

[4] Hidden Champions of the twenty-first Century. Hermann Simon. Springer, 2009.

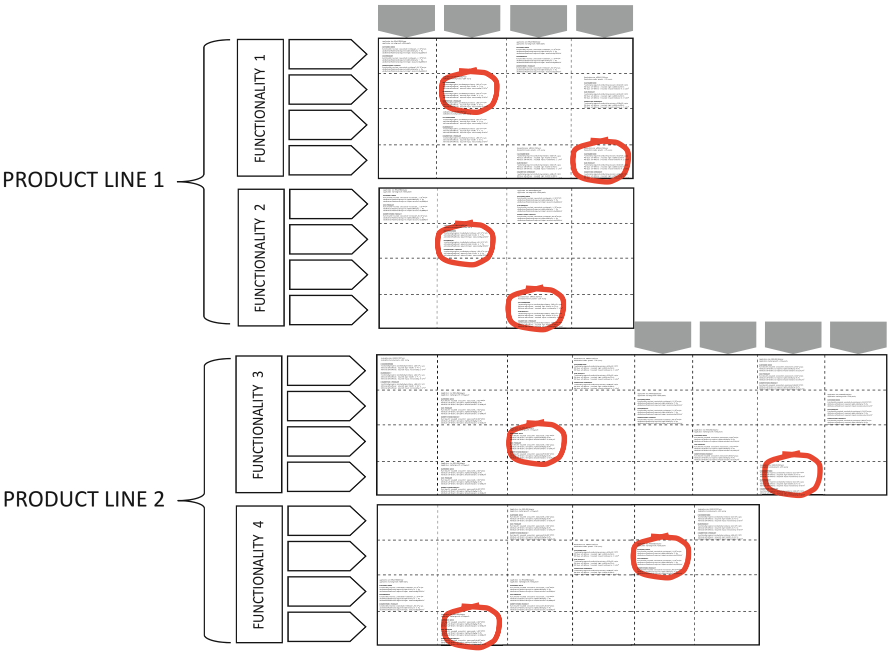

Fig. 5.13 In the matrix shown above, the vertical columns are for product applications, while the horizontal rows list each product (plus product functionalities and attributes). In this particular case, the industrial marketer weighed several different targeting variables (see text for more details) before deciding to focus the company's energies on certain target applications (these have been circled). These applications belong to well-known industrial sectors, making it easier for the company to expand its promotional efforts and coordinate sales

Consolidated product-application matrices are a good way of exposing any cross-selling potential within an application, and they can help a company determine whether it's possible to functionally integrate or combine different products. A company can use these types of matrices to discuss issues and make decisions related to the company's product plan. A company's product plan simply refers to its timetable for product development (this includes both product improvements and the development of radically new products) and new product introduction.

Moreover, it's a good tool for figuring out which applications to focus on, or which ones to abandon. This will be discussed in more detail below.

Effectively, these tables compare a product's characteristics (its functionalities and attributes) alongside its applications. By analyzing them, a company will get a fuller picture of how much specialization is still required for each application.

Of course, as mentioned previously, 'specialized diversification' depends on how feasible it is to specialize or adapt an offering for a particular application.

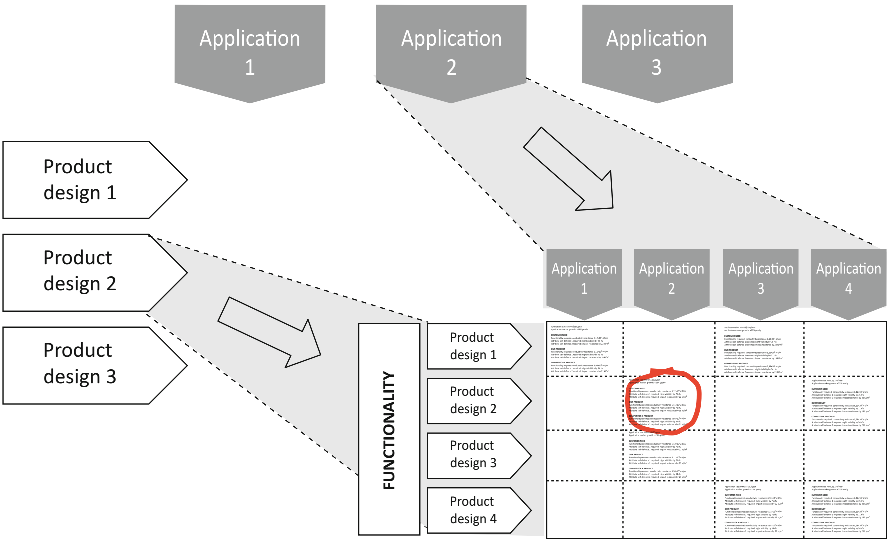

Fig. 5.14 Each application can be divided up into more specific sub-applications. Sub-applications give supplier-manufacturers greater opportunities for specializing their products

Stage N°5. Adapting a Product to Specific Applications

As industrial markets evolve, their products and services are becoming more and more technical and sophisticated, drawing from an ever-widening range of scientific fields. In turn, the applications for these products might seem increasingly specific and 'mysterious' for a traditional marketer, who is used to looking for large demographic segments of customers. For a more in-depth discussion on how industrial marketing affects product development and design, the reader should refer to Chap. 6 which specifically deals with this topic.

In the segmentation program described in this chapter (see Fig. 5.4), the targeting stage and the product adaptation stage are iterative and mutually reinforcing. Targeting leads to new product development, and, in turn, new products lead to increasingly specific applications (see the AAA cycle).

Technological specialization means that a company has found more specific applications within established ones, as shown in Fig. 5.14. The more a Discovery Team identifies specific and distinctive applications, the easier it is for a company to understand how industrial customers are evolving and prepare to respond.

Using Lead-User Research to Inspire Technological Innovation[5]

Generally speaking, new applications tend to originate from customers that are technological leaders in their field. Naturally, finding and identifying more specific

[5] Creating Breakthrough at 3 M. Eric von Hippel, Stefan Thomke, Mary Sonnack. HBR, September-October 1999.

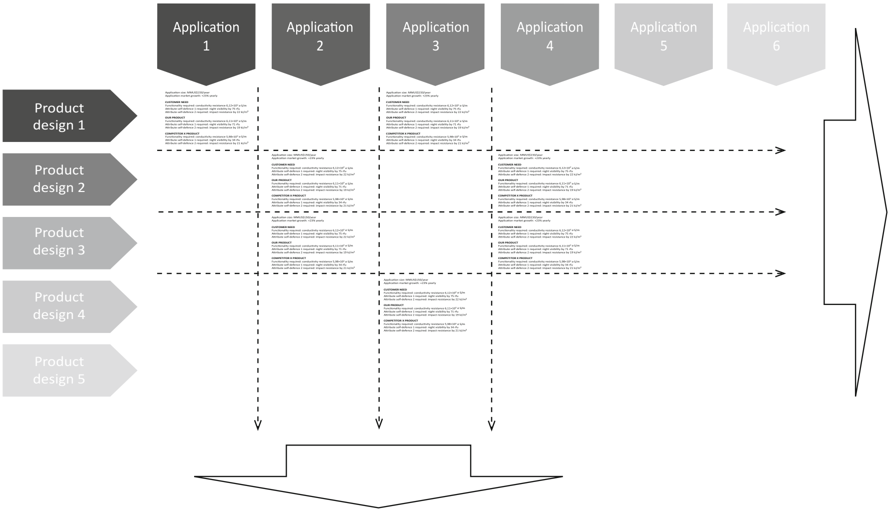

Fig. 5.15 Over time, a company's product-application matrix evolves. By continually exploring how products are used, a company is able to identify and document increasingly specific applications. For a company, this type of very specific, yet extensive documentation is key to targeting attractive applications

applications doesn't obligate a supplier to develop products for them. However, by identifying new applications early on, companies gain an undeniable competitive edge. A manufacturer will need to assess the potential market size as well as other factors in order to determine the feasibility of developing a product/service for a particular application.

For instance, car manufacturers might need air compressors for their paint shops. Some of these customers may need compressed air with less particulate contamination. Others may need pressurized air with less humidity, and others may require compressed air with less oil contaminants.

Eventually, as a company explores more and more potential applications, their product-application matrix will expand to encompass their growing product lines. This is shown in Fig. 5.15.

No doubt, a company can be good at developing products for certain applications, and less competent at developing products for others. As discussed earlier, a key part of targeting is determining whether or not its feasible to make product improvements for an application.

In reality, not all manufacturers are willing to develop increasingly specific products for increasingly specific applications; some manufacturers may simply choose to offer a *vanilla* product for several different applications. Yet, so long as the benefits customers receive outweigh the costs of specialization, then manufacturers that specialize their products/services will have a definite competitive edge. Manufacturers that offer *vanilla* products will try to leverage their production, commercialization, and product development costs (if, that is, these exist).

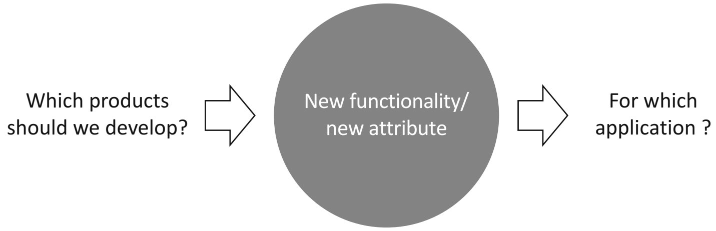

Fig. 5.16 When a company finds that users require a new functionality or new/improved attribute, this can lead to a more realistic and pragmatic discussion about the company's own competencies

Product Diversification via Related Functionalities and Attributes

If a company needs to diversify its product-application portfolio, it can start by focusing on its current products' key functionalities and attributes. This kind of strategy is less invasive for a company than a more unrelated, or forced, diversification would be. Codifying and articulating the functionalities or attributes that customers need is a powerful tool. Its repercussions extend far simply beyond benefiting current customers.

Of course, sometimes a company will find that a problem can only be solved by developing new functionalities or improved attributes that are not currently in their product portfolio. These findings offer significant opportunities for companies in the process of diversification. See Fig. 5.16.

The discovery and identification of new functionalities/attributes leads to the identification of new product applications. By studying these applications, a company can decide whether they'll be able to significantly benefit customers and whether it's economically feasible to develop products for a given application.

This stage requires an extensive 'industrial culture' so that companies can assess and discuss which industrial sectors might be interested in the new functionality or attribute.

Ideally, this should be a group discussion so that more people can contribute their ideas and experiences with regard to new product applications.

Take, for instance, an industrial floor coatings manufacturer. During market exploration, this manufacturer discovered that several wineries required their plants to be painted with floor coatings that prevented against bacterial and fungal contamination. The lack of microbial control increases the risk of producing contaminated wines, which wineries wouldn't be able to sell—or, at least, not as the *premium* wines they were meant to be. For the coatings supplier, this functionality can be identified and stated as, "control the growth of microbial contaminants." Having identified this functionality, the company can hold an intense and productive discussion about other applications that might need it and what products to develop.

The Link Between Applications and Standard Industrial Classification

At this point, the supplier's Discovery Team needs to assess whether or not target customers really need the functionality(ies) or attributes that have been identified.

The Discovery Team methodology has been extensively reviewed and discussed in previous chapters.

In most cases, once a company tags an application, it's easy to identify which industry it belongs to (e.g. automotive, arms industry, health care, information technology, aerospace, etc.).

What's the advantage to knowing an application's industrial classification? Companies within the same industry tend to have similar needs and related applications, which may present a supplier with opportunities for cross-selling. To that end, using a new application to identify a new economic or industrial sector could affect the range of products that are offered to customers.

In the example from above, wineries were also interested in other products with the same functionality (control of microbial contamination), such as antimicrobial coatings for walls, concrete tanks, and structural wood.

Stage N°6. Segmenting Markets According to Customer Purchasing Behavior

The final stage of an industrial market segmentation program consists of segmentation according to customer purchasing behavior. By this point, the company will already have identified and chosen (or targeted) applications for each product design. Now it's time to assess the purchasing behavior of every customer within these targeted applications.

As discussed at the beginning of this chapter, segmenting markets according to purchasing behavior should be one of the last steps in the segmentation program, not the first. Companies that think in the short-term and assume their product has reached maturity are the kind of companies that segment their markets *solely* based on purchasing behavior. In turn, those that think their product is 'irreversibly mature' end up with a 'commoditized' mentality and are generally unwilling to invest resources in new developments.

A New Product Versus a Mature Product

Sooner or later, all products end up reaching maturity. However, this doesn't mean that a manufacturer should behave reactively when it does. During the first half of the twentieth century, silicon, one of the most abundant elements on Earth, was considered the 'king of commodities'. Over the course of thousands of years, silicon (or its compounds) was used for any number of related applications: construction cement, glass, bricks, ceramics, varnishes, etc. Yet, during the second half of

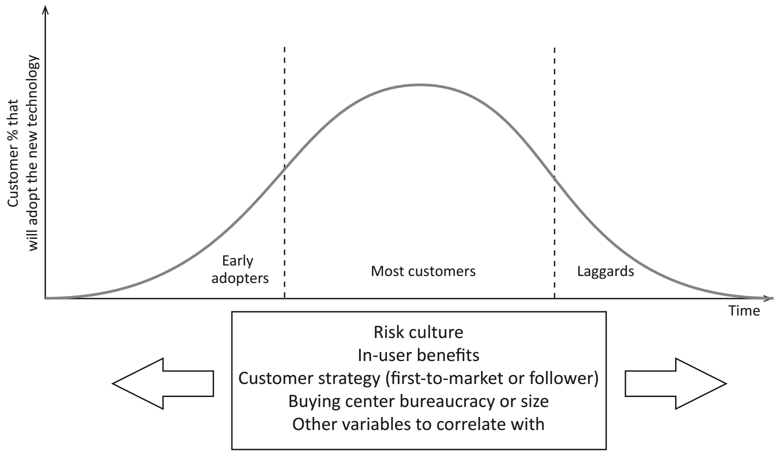

Fig. 5.17 The *rate of adoption* distinguishes between customers that are more or less inclined to buy new products or technologies at a given time. In order to determine a product's *rate of adoption*, an industrial marketing team needs to determine which customer characteristics will make customers more or less likely to adopt a product early on. This graph was adapted from Bourne, Francis, S., The Adoption Process. In *The Adoption of New Products* (Arbour, A., Foundation For Research on Human Development (1959) pp. 1–8)

the twentieth century, people began to create novel chemical combinations using silicon. This gave rise to products such as technical ceramics, silicone, and semiconductor devices. Without silicon and these new chemical combinations, modern electronics simply would not have been possible. For a more in-depth discussion on Commodity Marketing, the reader should turn to Chap. 3.

Within a single application, individual customers can have very divergent purchasing behavior. For a supplier, this might be reflected in the way a customer adopts new products, or in the way they buy mature products (in which case, the price of the product and any additional services become more important). For instance, when a company develops a new technology, it will want to determine the *rate of adoption* for its product. Conversely, manufacturers whose products are already routinely purchased will want to group their customers according to price or service sensitivity. Of course, both of these variables depend on other factors that have to do with the customer's characteristics and circumstances. This is shown in Fig. 5.17 (for new products) and Fig. 5.18 (for mature products).

The Final Cut: Industrial Customers and Their Individual Circumstances

By this point, a company will have identified its product's target applications and grouped customers according to their purchasing behavior. Now, a company's objective is to penetrate the market in the best way possible by fine-tuning its offering to fit the needs of each type of customer.

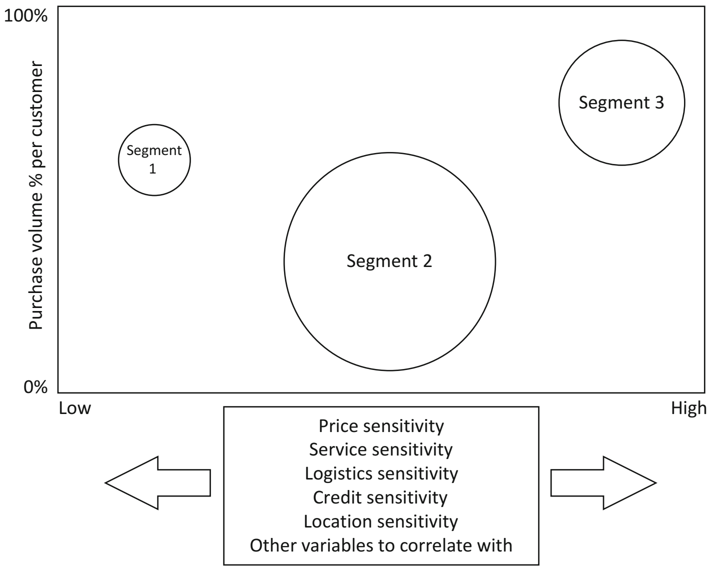

Fig. 5.18 Companies can use this tool to help them understand and classify customer purchasing behavior for mature technical products. A company needs to determine each customer's 'share-of purchases' (this concept can be considered analogous to the consumer term 'share-of-wallet'). This number is influenced by various factors (which are listed below the x-axis). An industrial marketing team should identify each customer's characteristics and group segments according to purchasing behavior. The size of each of these segments is represented by the size of the circles shown in the graph

During the sixth stage of an industrial market segmentation program (Fig. 5.4), a company may need to rule out certain customers based on their purchasing behavior and circumstances. A customer's 'circumstances' have to do with certain situational factors (some of which were mentioned earlier). These factors include:

1. Whether the right local distributors/integrators are available
2. The strength or presence of competition, or substitutes
3. Local protectionist policies
4. Any imitative competition in the local community
5. Any social/political/economic risks in the local community

Once the final stage in the segmentation program is complete, a company should inform its members which applications and segments are of interest to the organization. A segmentation program can only be successful so long as a company's key activities are geared towards better serving its target markets.

By targeting applications, targeting customers, and adapting each product, a company takes one of the most important steps in its strategic process. From now on, all other organizational activities such as sales, product/service development, production, logistics, management, human resources, relationships with suppliers, or finances will be more clearly defined and effective.

Now, a company will have a better understanding of *what-to-do*.

Industrial Product Design and Development

6

Introduction

Until recently, scientists weren't formally involved in business operations; in fact, it was only in 1840 that scientists were first contracted by a company. Prior to this, there had been some meager attempts in the newly founded French Republic to spur collaboration between the government and the scientific community, all in the hopes of creating programs that would benefit the common good. Although these efforts were modest, the results were phenomenal. They gave rise to things such as the telegraph, hot air balloons used for aerial observation, new types of furnaces, as well as dyes, cables, the first plastics, and much more.

Unfortunately, none of this managed to effectively break down the barrier between science and business. Indeed, the barrier remained as strong and exclusive as ever.

In 1906, *Science* journal broke ground by publishing its first list of four thousand scientific researchers. Every single name on the list belonged to scientists that worked for universities; not a single industrial researcher was named. It seems that both then and now, people believed in the dichotomy between 'research in fundamental science' versus 'applied research'; the first is seen as purely academic and the second is seen as something businesses do.[1] For decades, this was apparent in the way people spoke: universities conducted research, while for-profit companies were in charge of development.

In today's world, the percentage of scientists or engineers working for technical companies is still less than one would expect. In fact, in recent years, because of mergers and acquisitions between pharmaceutical companies, this number has even decreased. Moreover, the academic world and the industrial world are still wary of one another, something that has been incredibly slow to change. The one exception is Germany's dual education system, in which young university students start

[1] Research or Development? A Short History of Research and Development as Categories. Originally published in German in: Gegenworte. Benoît Godin and Joseph Lane. 2011.

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_6

working while they're still at school. This makes it easier for students, academics and businesspeople to collaborate with one another. Yet, even this system has its weaknesses—it still needs to extend and broaden these programs and encourage more people's participation.

Whatever the case may be, now that we're in the twenty-first century, it's difficult to ascertain whether the standard and quality of people's lives are improving at a reasonable rate. In today's world, governments, companies, and universities have amassed a substantial body of knowledge and technology; it is more than enough to solve some of the issues plaguing humans today, issues that continue to cause suffering, hardship, or that are severely inhibiting. Thus, 'a reasonable rate' just refers to how much things *should* be improving given our current knowledge and technology. For instance, Gordon E. Moore observed that the number of transistors in a microprocessor should double every 2 years.[2] With time, this phenomenon has proven to be true. Today, this is commonly known as Moore's Law.

As for other technologies, there's very little consensus about what an 'appropriate' rate of progress would be. This is due, in part, to the fact that there's no clear definition of what constitutes a 'radical invention'. On the one hand, some authors claim that human progress is currently undergoing a 'rapid growth' stage, one that is equivalent to the rapid growth shown on an S curve. Or, in other words, that progress is currently doubling exponentially, just as in Moore's Law. On the other hand, however, there are authors that argue that human progress is currently stymied and radical inventions have become stagnated.[3]

Regardless of curves or graphs that show the rate of technological progress, this author believes that technological progress is not currently living up to its true potential. The reason? Because lots of organizations aren't doing the research and development that they should, and even the ones that do aren't necessarily doing it well.

An Empty Shell: What Happens When a Company Doesn't Develop Products

Compared to companies that develop new products, companies that don't are like empty shells. Companies that don't do any research and development aren't able to take customers' needs as seriously as those that do. Without research and development, the only thing left for a company to do is put the finishing touches on its administration, production techniques, and business model. These types of companies merely manufacture and commercialize products that someone else designed and developed long ago, and they hope that economic circumstances alone will generate high demand for their offerings.

[2] Cramming more components onto integrated circuits. Moore, Gordon E. Electronics Magazine, 1965.

[3] The Great Stagnation. Tyler Cowen. Dutton Adult, 2011.

Of course, this isn't to say that there's not a lot of work to be done at these kinds of companies. As discussed in Chap. 2, these companies tend to use a lot of *how-to-do* tools, including: TQM, improvements to their IT system, labor union management, distribution management, lean production, etc. Without research and development, these tools may be the lone sources of excitement and motivation for company employees; beyond that, life at these companies is often characterized by tedium, interrupted every so often by periods of intense stress. For these companies, *what-to-do* is often a matter of upping their nameplate capacity, expanding into new geographic regions, diversifying via mergers with other companies, and redesigning their supply chains, to give just a few examples. Unfortunately, these projects are usually relegated to a small group of people (often members of upper management). For the rest of the company, work life revolves around assets and liabilities, purchasing supplies in order to manufacture products, manufacturing products in order to sell them, and selling products in order to make money. Little surprise, then, that people who work at companies that conduct research and development are impassioned and galvanized in a way that people who work at 'empty shell' companies are not.

Of course, a company needs more than passion and adrenaline to develop new products and services. Product development is a key part of a company's future, and it's directly related to the *contribution* a company makes to its customers, markets, and the world. The business paradigm that permeates this book is clear about one thing: the benefits users receive from a technology are the driving force behind a company's profit flows. When companies forget this—when they prioritize profitability and shareholder value, and see these things as their *raison d'être*—then they're liable to get sucked into a downward spiral. Finding their way out again can be incredibly difficult.

Nothing illustrates this better than the experiences of a few short-sighted pharmaceutical companies. Just like any other industry, pharmaceutical companies are deeply affected by how their organization relates to product development. The difference is that for pharmaceutical businesses, everything happens at a much quicker pace.

The huge pharmaceutical firm, Pfizer, serves as a clear and dramatic example. For nearly two decades, Pfizer made large sums of money off of its two main products: Viagra and Lipitol. However, when the patents on these drugs expired, the crisis at Pfizer reached a boiling point. Over the course of those two decades, Pfizer had invested its resources in randomly acquiring smaller biotechnology companies.[4] Meanwhile, they had spent less and less money on their own product development. In 2011 and 2012, the company experienced a sharp drop in its earnings and, as a result, they were forced to sell a few of their most prized and attractive businesses. Nowadays, Pfizer still manufactures products that are beneficial to customers and profitable for the company. However, one thing hasn't changed: the company still insists on building its product portfolio by acquiring companies that have active and promising patents. Several specialized analysts have decried this business strategy,[5,6]

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[4] Pfizer Races to Reinvent Itself. Business Day section, The New York Times. Katie Thomas, May 1, 2012.

[5] A Biotech Lesson for Big Pharma Mergers. The Wall Street Journal. Scott Gottlieb. April 29, 2014.

[6] Does Pfizer hate patents? Forbes. Steve Denning. May 20, 2014.

pointing to its excessive financial engineering and, worse still, the fact that with each business acquisition, Pfizer has laid off scientific personnel and invested less resources in research and development.

Thus, when Pfizer tried, and failed, to acquire AstraZeneca in May, 2014, it sparked an intense governmental debate in both England and Sweden. At issue was whether foreign companies known for cutting research staff and closing laboratories should be allowed to take over other, private companies.[7] Before long, a few more prominent politicians were calling the potential takeover a "threat to UK science"[8] and a tax evasion scheme. Especially for Swedes, this whole episode brought to mind their recent (and rather bitter) experience of the Pfizer-Pharmacia merger. When Pfizer acquired Pharmacia in 2003, Pharmacia employed a total of 4000 people. By 2014, however, this number had dwindled to a mere 500.

What Does a Company Need in Order to Do Good Product Development?

It's hard to imagine how a company that doesn't do any product development could possibly transform into a company that does. The easiest thing to do would be to fire the company's employees, its board of directors, and its shareholders. Why? Because as will be discussed below, product development is a part of a company's entire functional and cultural structure. Depending on a company's industrial sector, it might spend between 5 and 15 % of its sales on research and development projects over a set amount of time. Not to mention that a company will have to make other initial investments, such as building facilities, hiring personnel, and buying any necessary materials and equipment.

Even when financing isn't an obstacle, companies that are new to R+D are still faced with other kinds of challenges. They may not know how to manage a development program and they may lack different areas of functional know-how that are required for the project. For these companies, their biggest challenge is changing the way managers think.

To better understand the nature of this issue, the reader should try imagining just how much of a paradigm shift needs to take place. Many business managers are used to basing their decisions off of two main variables: company earnings and costs. Even small changes to their budgets can set them on edge. Not surprisingly, then, these managers will find it difficult to understand that a significant portion of company money should be spent on something as 'abstract' as researching customer needs—especially considering that these types of projects can last a long time, might not lead to anything, and can sometimes end in products that don't sell well. Also, there's always the risk that new products will be copied by other unscrupulous competitors.

[7] Pfizer's Bad Drug Deal. Opinion Europe. The Wall Street Journal. Anders Borg, Annie Lööf y Jan Björklund. May 15, 2014.

[8] MPs label Pfizer's Astra bid a 'threat to UK science. Fundweb. Sam Macdonald. May 14, 2014.

Fig. 6.1 From idea to product. This exemplifies the amount of effort that the pharmaceutical company, Roche, puts into its product development. *Source*: www.roche.com

Figure 6.1 shows an example of an advertising design created by Roche. Unlike other advertising designs, the one shown below truly captures the immense amount of effort and dedication that goes into product development.

In order to foster a culture of product development, a company will need to meet the following basic requirements:

1. Senior managers have to be *passionately* involved in development projects. This is easier for a corporate culture that supports and encourages entrepreneurial and risk-taking behavior.
2. Company members must sincerely uphold the *creed* that new product development is the right path for the company's future.
3. An empowered and dedicated product development team.
4. A formal and structured protocol for product development.
5. In contrast to more egocentric departmental behavior, companies have to focus on the solutions they're providing to customers.
6. A functional design (in terms of time and resources) that allows different areas of a company to work together as a team.
7. Explicit and formal resource allocation for various development activities. There is no free lunch in product development.

This chapter is meant for industrial companies that are looking to make their product development projects more productive and efficient.

Turning Customer Needs into Product/Service Development

Out of all of a company's interdepartmental projects and processes, the least systematized seems to be the one that connects market research findings to product development. It should surprise no one that several truly excellent books on product development have dedicated entire chapters to topics such as identifying market opportunities, product planning, identifying customer needs, and creating the metric specifications for product design.[9] In other words, the product development team is forced to review and 'translate' the marketing department's rather shallow findings.

This type of process tends to be most effective in consumer markets where a customer's psychological needs can be just as important as a product's physical characteristics. In an industrial context, however, market research has to incorporate a higher level of engineering knowledge. If it doesn't, it won't be capable of getting important information from customers and passing that information along to the product development team (using shared and mutually-understood terminology). As discussed in Chap. 4, this is exactly the sort of challenge that the Discovery Team© is tasked with.

What an industrial marketing team has to understand is that the findings from market research have to provide appropriate and useful information to a product development team. In fact, as discussed previously, a Discovery Team's most important members are technical professionals who may also double as members of the product development team. Essentially, companies need to have a well-defined market research programme; this helps them save time and resources when developing new products.

This volume has proposed the Discovery Team as a practical research method, one that adheres to a paradigm of *ongoing field exploration*. By continuously and dedicatedly engaging in this type of work, a company ensures that there's ongoing iteration between market research and product development (this will be discussed in greater detail below). Also, for a company, this will put them at the forefront of whatever changes are occurring in the marketplace.

Figure 6.2 illustrates which aspects of the Discovery Team method are necessary for the new product development team (NPDT).

Where Needs Arise: The Marketplace Versus the Laboratory

In 2004, Andre Geim and Kostya Novoselov from the University of Manchester, UK, became the first physicists to successfully exfoliate a flat monolayer of pure carbon. As a result, Graphene was born. Graphene is a two-dimensional material known for its excellent electrical conductivity, its tensile strength (it's a hundred time stronger than steel), its thermal conductivity, and its quantum Hall effects (this has very promising practical implications). Many people predict that Graphene—either on its own or combined with other elements—will end up having a revolutionary effect on other applications, such as aeronautics, the automotive industry, electronics, energy storage, communications systems, industrial coatings, solar energy, etc.

[9] Product Design and Development, Fifth edition. Karl T. Ulrich and Steven D. Eppinger. McGraw Hill International Edition. 2012.

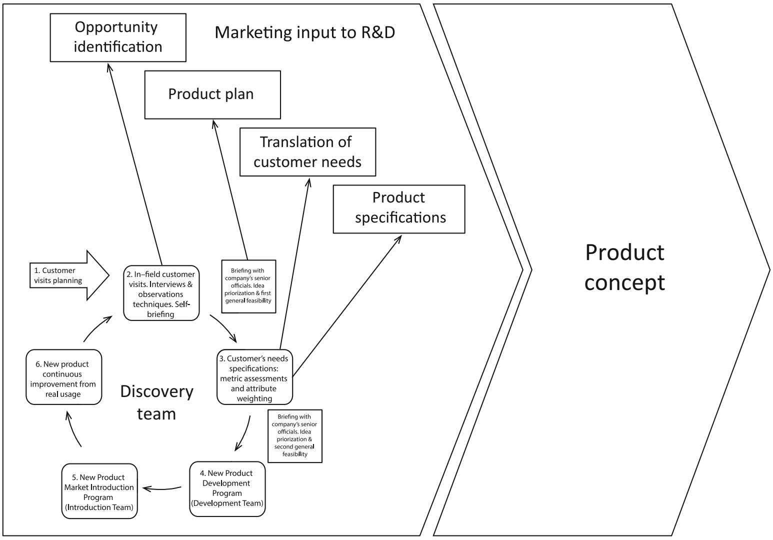


Fig. 6.2 Findings from an industrial marketing team's research have to be adapted for the new product development team (NPDT). The Discovery Team method discussed in Chap. 4 meets this requirement. Otherwise, then the NPDT would have to translate customer needs into technical specifications before they could start working on a product concept

There are countless other materials, compounds and technologies that, like Graphene, are developed in laboratories, workshops or in the midst of production processes. Sometimes these products are created fortuitously, while in other instances (such as for graphene), they're the result of some previous theoretical investigation.

These huge, ground-breaking discoveries aren't necessarily derived from market research. Yet, as is true for Graphene, it doesn't take long before they're put to use in various market applications.[10]

In fact, companies that work on developing new products and technologies often end up discovering other, secondary properties along the way. A company should study these discoveries and take full advantage of their potential market applications.

How does marketing work in a laboratory setting with technologies created more or less by happenstance? Here, it's necessary to refer back to the concepts of product functionality and product attributes (see Chap. 2). When experiments at university or corporate research labs lead to the discovery of new properties, then those properties have to be corroborated with further testing, conceptualized as product functionalities or attributes, and finally, assessed in terms of their potential market applications. This is shown in Fig. 6.3. What's especially interesting here, is the creation of product concepts (this refers to a product's experimental pre-design).

[10] N.A. However, scientists predicted the existence of graphene and its properties decades before it was actually discovered.

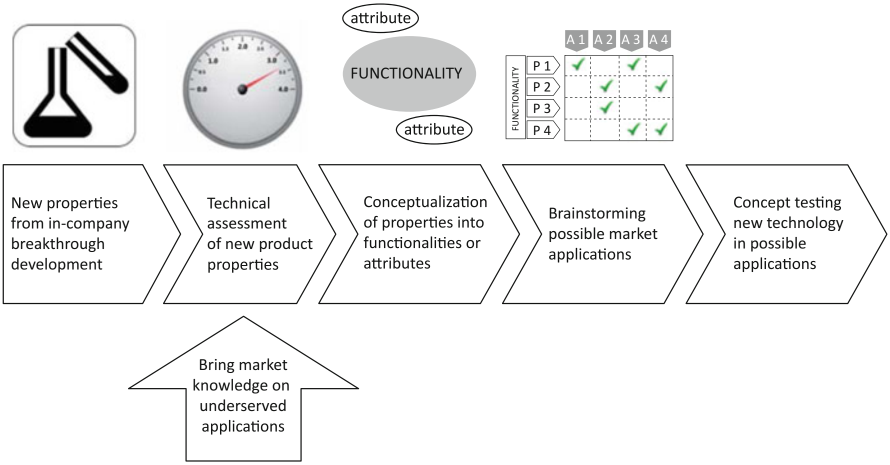


Fig. 6.3 The above diagram shows a standard procedure for technological discoveries made in a laboratory. This involves confirming and measuring a new technology's properties, conceptualizing its functionalities and attributes, and, lastly, determining its potential market applications. Following this, a Discovery Team will need to do concept testing amongst a chosen group of potential customers. From there, a company can refine its technical specifications and begin the process of designing, developing, and manufacturing a new product

Product concepts are used, for instance, during 'concept testing', which is one of the most important stages of product development. This will be discussed in greater detail below. Once a product concept is approved by target application customers, a company will need to conduct a feasibility study and subsequently design, develop and upscale the new product. In other words, this is the stage of product development where independent discovery and customer need are finally merged together. No doubt, if it's a radically new product, a company will want to make sure that the product is technologically and functionally stable before they begin to commercialize it. To that end, a company will need to work together with target application customers and target suppliers during the development process.

A Product Development Program

New product development is a process that begins with well-thought-out market research and ends with the manufacturing, dispatch, and use of a newly engineered product.

Within a company, this process needs to be thought of as a multidisciplinary effort and not as some isolated task relegated to the research and development department. It's absolutely essential for the following areas within a company to be involved: marketing, manufacturing, logistics, purchasing, industrial design, customer MRO service, electronic design (if applicable), and mechanical design (if applicable). Other areas with more peripheral roles include: finances, sales, the legal department, human resources, and external consultants.

Above all, the product development process needs to be thought of as a structured and methodical program. This is because:

- A systematic product development program allows a company to process and leverage their market research findings (e.g. Discovery Team).
- It significantly reduces the risk of failure due to procedural errors or omissions, poor coordination, or incomplete checklists.
- An organization can systematize what it learns and experiences during the product development process.
- It allows a company to create formal, agreed-upon checkpoints where a project can be discarded or put on hold.
- It allows a company to rationalize and prioritize more than one project at a time in their overall product plan.

There's a great deal of research that shows that companies with a structured method for product development have a far easier time introducing new products into the market (see Chap. 12).

The diagram in Fig. 6.4 is an example of the overall process of technical product development. It's important for the reader to understand that, depending on the author, there are numerous proposed methods for product development. As a general rule, these methods tend to include the following stages: creation of a product concept, feasibility assessment, and product design.

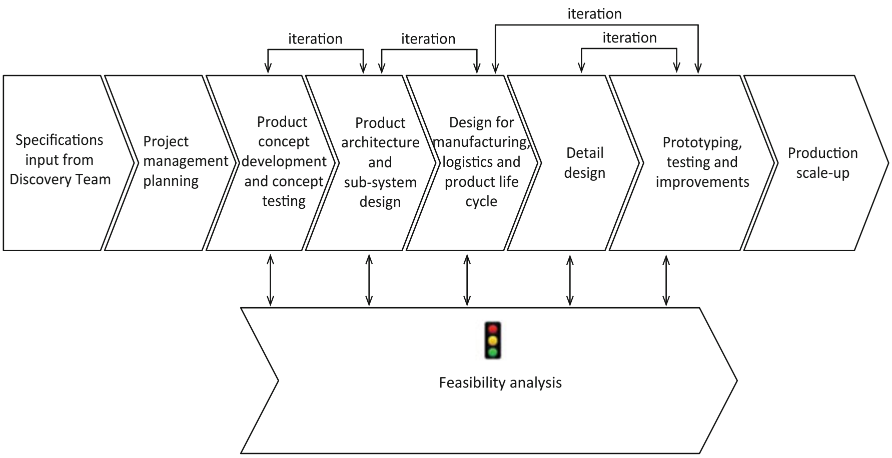


Fig. 6.4 A process for developing technical products. These stages don't always take place in the order shown above. Both the iterations (represented by the *black arrows*) as well as the feasibility analyses are stages that can be worked on simultaneously

Stage N°1. The Discovery Team's Specification of Application Needs

Chapter 4 of this volume discussed how customer needs get translated into technical specifications, each with its own metric. However, the Discovery Team should be prepared to conduct more fieldwork if the development team needs them to. Over the course of the development process, different types of questions and uncertainties crop up—these can be resolved by getting input from customers, intermediaries or specifiers who may or may not be invited to participate in the development project.

Stage N°2. Planning a Product Development Project

During the second stage of the development program, a company will take the Discovery Team's ideas and information on customer needs and hold a multidisciplinary meeting with company higher-ups. Here, company members will be able to discuss their Product Plan and approval of their new project. This meeting is frequently called the 'Go/No-Go meeting' (see Stage 4 in the Discovery Team cycle, Chap. 4) since senior management will decide whether or not to launch a given product development project. By examining the Discovery Team's specifications, the participants at these multidisciplinary meetings will have the information they need to decide whether to move towards developing a new product. Also, they can ask the future leader of the development team to start organizing the team and formalizing the project.

Below, the reader will find a brief discussion of certain project management concepts that are good to keep in mind during a product development project. However, the focus of this book is not project management, so any reader who wishes to deepen their understanding in this area should refer to other sources specially devoted to this topic.

The Development Project's Mission Statement

For an NPDT, a development project's mission statement serves as a guide: it explicitly states where the NPDT is headed and what its goal is for a given project. It should include elements that are challenging and inspirational, and, more formally, it should outline what the objectives are for the new product. This document can include information such as:

- A basic description of the product
- A description of the product's functionality
- Business objectives
- A description of attributes that the product will need to have
- The target application
- Project milestones and a project timetable

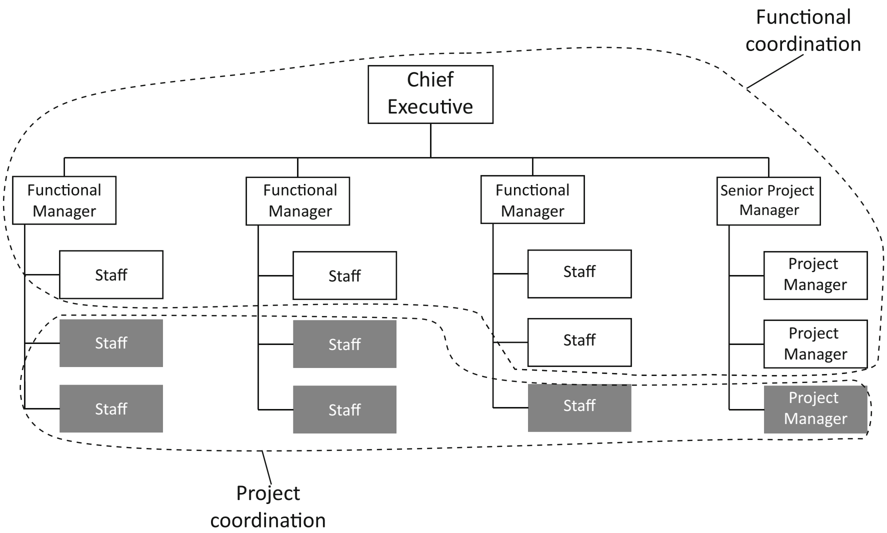


Fig. 6.5 The above organizational chart shows two possible organizational structures for an NPDT: functional organization or organization according to project. In the first instance, each specialized function is kept relatively separate from others. In the second, the project executive is transversally responsible for a multidisciplinary team

The NPDT can also incorporate their own 'team mission' into this project mission statement. Also, it's natural for an NPDT to chose a project name so that the project can be easily identified and ranked within the company.

The Structure and Organization of a Development Team (New Product Development Team NPDT)

Any new potential product deserves its own development team. This team is not the same as the Discovery Team, although some DT members may double as members of a development team and vice versa. An NPDT's organizational structure depends on the needs of each project. In this regard, there are two basic organizational configurations: either by function/field (e.g. electronics, marketing, hydraulics, etc.) or by tasks/projects. See Fig. 6.5.

A matrix organizational structure is a halfway point between functional organization and organization according to project, and as such, it incorporates the best of both worlds. Teams with a matrix organizational structure are geared either towards specialized functions or multidisciplinary work aimed at successfully carrying out the project. This is shown in Fig. 6.6

Choosing between one or another type of organizational structure depends on the architecture of the future product. On the whole, when projects are lead by project executives (or Project Managers) they tend to be better coordinated and things move along more quickly—this can be good for developing products with an *integral*

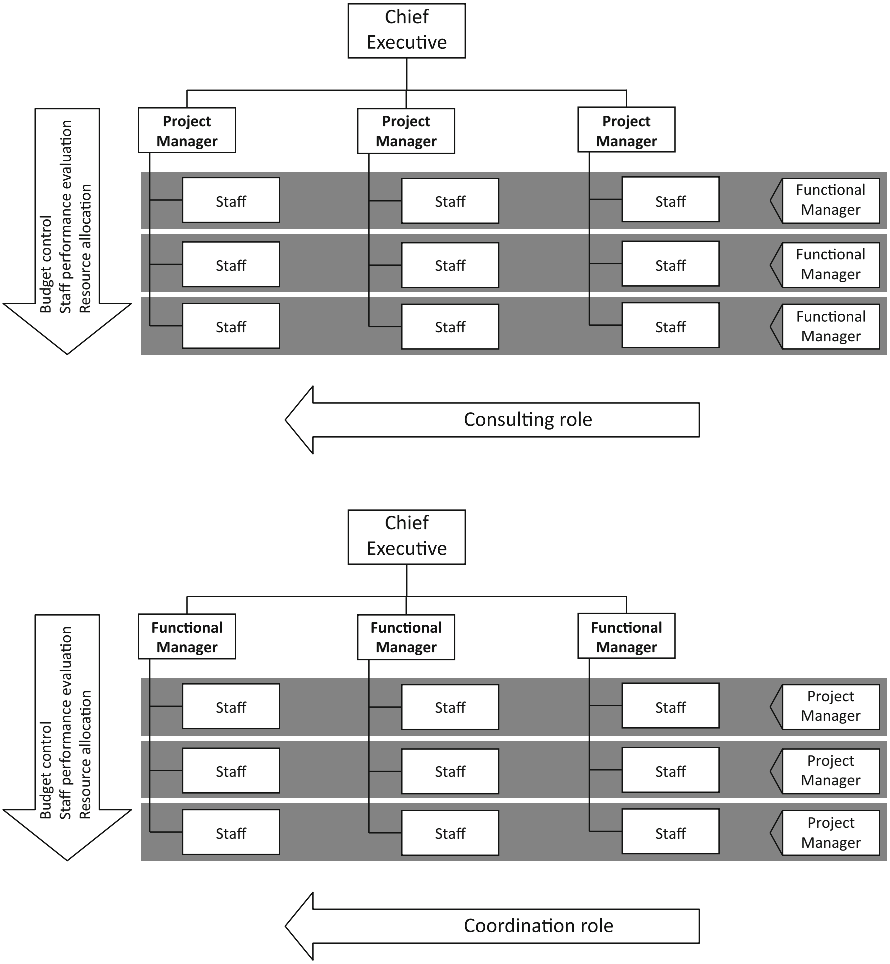


Fig. 6.6 *Above*. Matrix organizational structure in which more power is given to the project executive. In this case, the functional executive is the chief consultant for issues or procedures that require a greater degree of technical expertise. *Below*. Matrix organizational structure in which more power is given to the functional executive (e.g. hydraulics, electronics, metallurgy, marketing, logistics, etc.). In this case, the project executive functions as a coordinator who keeps project *momentum* going

architecture (see below). Projects that are organized according to functions are able to carry out tasks in a deeper, more comprehensive way. Additionally, they take advantage of people's accumulated know-how built up over the course of other, similar development projects. This type of configuration works well for developing products with a *modular* architecture.

When developing technical products for industrial markets, it may be a good idea to give the NPDT a functional organizational structure if the product in question is technically complex or if a company's corporate culture facilitates transversal coordination. Additionally, companies may want to give their NPDT a functional organizational structure because of market complexity and logistics. For instance, products that are going to be introduced into various, highly-competitive global markets require more committed and in-depth planning and execution from industrial marketing personnel.

When the product being developed is relatively simple (and so is its market context) then it may be a good idea for the development team to be headed by a project executive, thus expediting project planning and execution.

Who should be on the development team? The development team should be made up of three types of members: permanent members, transitional members, and visiting members.

Permanent members are company professionals that can contribute their knowledge and experience in a specialized function or administrative science. This includes professionals in engineering, sciences, marketing, production, logistics, finances, and others.

Industrial marketing specialists play a particularly crucial role. It's their job to help the team understand the technical specifications that customers need and begin working on the plan for product introduction (the latter requires feedback from the development project). Sometimes, both the R&D and operations departments will want to make changes to the original product design (which was developed after visiting with customers). These types of changes have to do with costs, manufacturing feasibility, productivity, etc. Marketing personnel need to make sure that these changes don't impact on the new product's performance/attributes in any significant way. Over the course of meetings and as the development project progresses, marketing personnel will find that new product characteristics begin to appear. This occurs when a product is conceptualized, designed, and the first prototypes begin to be manufactured. These new characteristics can be hugely significant in helping to discover new product functionalities, attributes, and applications, and developing future versions of a product.

It's important for production department representatives to make sure that a product design is 'manufacturable', both technically, time-wise and economically. Additionally, depending on the product design, they can give feedback to the NPDT about any factory or factory personnel requirements.

Logistics department representatives are in charge of coordinating the receival of necessary product materials and components. Additionally, they identify any needs and requirements that allow the new product to be properly packaged, labeled, transported, and stored.

The transitional members of an NPDT are technical professionals whose expertise is occasionally required to resolve specific issues. These professionals can be grouped according to the new product's technological subsystems or components (e.g. information processors, mechanical systems, electrical systems, etc.). Ideally, a company should plan in advance when permanent and transitional members will need to work together. This helps sidestep any scheduling conflicts or conflicts due to installed capacity and people's work hours.

Visiting members participate in development meetings whenever their presence is required. This does not mean that their contributions to the group are any less important. Visiting members generally include:

– General manager (if he/she is not already leading the project)
– The Discovery Team (or some members of the DT)
– Customers in connection with the potential product
– Suppliers in connection with the potential product
– Specialized technical consultants

Whenever the NPDT arrives at an information crossroads or if they need help making a decision, they should consult with the general manager. Of course, the general manager can also participate as much or as often as he/she deems necessary. In essence, when an issue goes above NPDT members' authority, then they'll need to seek assistance from company higher-ups.

The Discovery Team (or members of the DT) is called in to participate if there are questions regarding the information they gathered during fieldwork or if more fieldwork is required.

The customers and suppliers that participate in the development project deserve special mention. Customers in connection with the potential product play a crucial role by helping the NPDT test product prototypes. On occasion, a supplier-manufacturer will need to run technical tests on a product prototype and will need help from a select group of customers (see industrial/beta testing stage). Additionally, the product design may undergo changes and these changes will need to be analyzed and reviewed by target application customers.

In order to successfully develop the right product, it's extremely important for a company to collaborate with a select group of strategically important suppliers. It's good to remember that a manufacturer's new technology hinges on the technological development of their key suppliers. These technological developments may be in one or more of the new product's subsystems (e.g. computer system, special materials used to reduce the product's weight, transmission system, etc.).

Whenever there's customer or supplier participation, a company needs to consider the legal aspects of confidentiality. Naturally, a supplier that develops a new technology for a customer will want to increase their market potential as soon as possible. Likewise, participating customers will eventually want a new product or technology to be offered by as many suppliers as possible. Either way, the company heading the development project will need to deal with these issues sensibly; no doubt, the wishes and aims of their collaborators are legitimate and their demands should be met within a reasonable amount of time. Chapter 12, which deals with how to introduce new technical products into the market, explores these issues in more depth.

Scheduling Interdependent Development Activities

Doing time management for a development project can easily turn into one of the most difficult corporate administrative tasks. Not only are there a huge amount of tasks and activities that have to be timed and coordinated, but there's also a huge amount of uncertainty involved in conceptualizing and developing something that doesn't exist yet and that, moreover, has to be ready within a set amount of time and is usually under pressure.

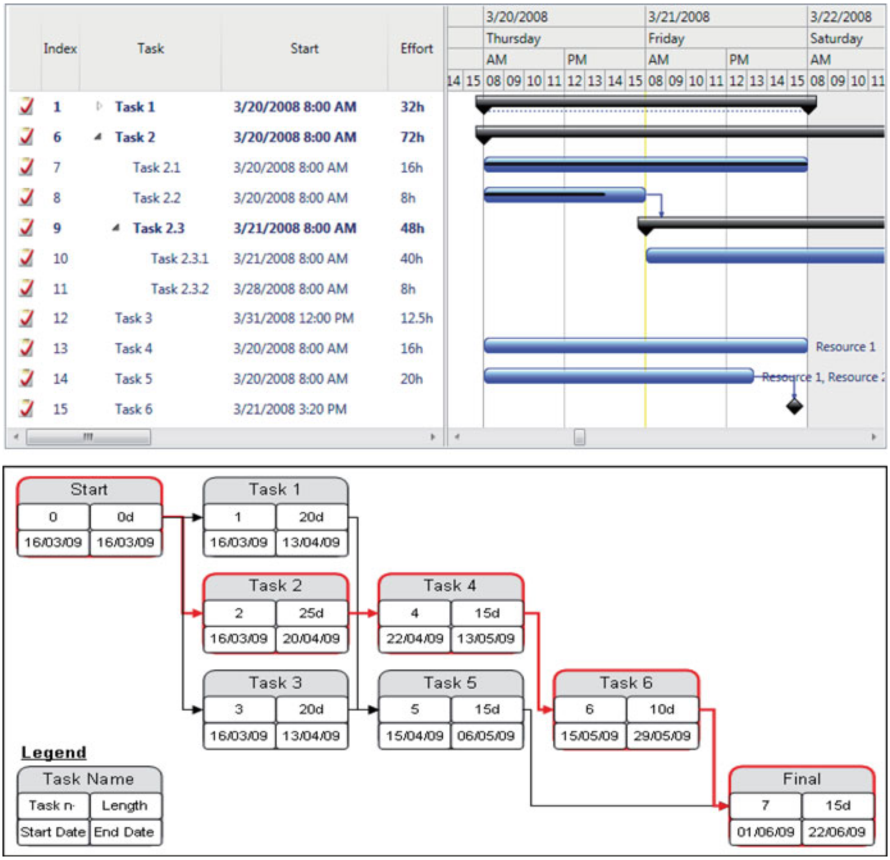


Fig. 6.7 *Above*. The Gantt chart is a linear representation that shows how much time it takes to finish a particular task. *Below*. A PERT chart can include several parallel, or interconnected, nodes of activities. In both types of charts, Gantt or PERT, the relationships between activities is represented using *black arrows*

There are a few timing concepts for complex projects that the head of the NPDT should be familiar with. Activity planning rests on two key concepts: task timing and sequencing. For more practical information on what kind of tools this involves, the reader should refer to other literature specifically devoted to this topic.

Basically, a standard Gantt chart is a horizontal timetable showing how project activities are timed. This can be seen in Fig. 6.7. The advantage to this chart is that it includes information such as: tasks that are done parallel to one another, who is responsible for each task, milestones marking the beginning and end of different activities, and the precise dates for each. However, what this tool doesn't show is how these tasks are codependent (e.g. tasks that need to begin before others have finished).

Companies with more experience in formal product development programs (especially ones in more familiar territory, such as development within an established product line) will be able to include more precise dates and milestones in their Gantt chart. These companies are familiar with the different kinds of hold-ups in development programs and as a result, they're used to allowing for extra time in order to accommodate any unexpected delays. These delays can result from research and development activities, production challenges, prototype failures, etc.

Although it's not as commonly used, the PERT Chart (*Program Evaluation Review Technique*) is more sophisticated than the Gantt chart when it comes to complex projects. In fact, complex projects is exactly what this chart is best at. The advantage to this chart is that it clearly shows how activities in a nodal system are codependent. This is shown in Fig. 6.7.

These two tools complement one another; while one of them (PERT) shows how activities are interdependent, the other (Gantt) identifies particular project milestones.

As is true for any timetable that attempts to get tangible deliverables from a project that may or may not lead to anything, it's best to set a start date and an end date for a development project. A more proactive form of project management would deduce the project start date from the product introduction date. In this case, the product introduction date is also influenced by market intelligence. For example, the intensity of competition or technological imitation by other markets players, etc. In other words, the new product's estimated life cycle and its relationship with customers, suppliers and competitors will help a company determine an appropriate development project timetable.

The Development Project Budget

Most of the time, the majority of a development project's budget (up to 80 %) goes to personnel costs.[11] As discussed above, given that a company can't be completely certain about how long a project will last, there will necessarily be some initial uncertainty as to how much the project will cost (initial cost estimates are only about 30 to 50 % accurate). For this very reason it's a good idea to allow for a margin of error when designing an initial budget for a project. Once again, the reader is welcome to review other books that specifically deal with designing budgets for highly open-ended projects.

Stage N°3. Developing, Selecting, and Testing Product Concepts

The product concept is a preliminary description of a product that includes information such as: the technologies that make the product possible, the product's components, how it will work, its shape and size. This description can be written-up and accompanied by graphic representations; these images should adhere to the characteristics required by target application customers.

[11] Product Design and Development, Fifth edition. Karl T. Ulrich and Steven D. Eppinger. McGraw Hill International Edition. 2012.

The product concept is crucial since it helps guide the way through later stages of product development. Not having a well-designed product concept makes it hard to do an accurate feasibility analysis, and it undermines designs for the product's manufacturing, logistics, and life cycle. Moreover, it puts a company at risk of introducing an inferior product into the marketplace.

Coming up with a product concept is an eminently creative job. As such, several authors recommend following a set of systematic and structured protocols to ensure that the product concept remains orderly and comprehensive. These protocols share the following characteristics:

- They recommend that as a part of this process, a company should brainstorm several pre-concepts for the product. This exhausts all design possibilities and configurations.
- They recommend researching other product ideas (both related and non-related). This is a way to explore other design possibilities and can spark the NPDT's creativity.
- They recommend using problem-solving strategies and techniques.
- They recommend using classification techniques. This helps an NPDT discover technological relationships between the product's subsystems.
- They recommend that a company consider variables that come up during the later stages of a product's development, production, commercialization, use and maintenance.

The Stages of Product Concept Development

While it may seem obvious, the administrative and functional complexity of building a product concept depends on how many subsystems a product has. The stages described below apply to a physical product or a complex service. However, important techniques for inspiring the NPDT's creativity will only be superficially discussed here. There is an abundant amount of literature devoted to this topic that the reader can refer to.

Analyze, Understand and Represent the Needs of Target Application Customers

Using information gathered during market research (e.g. Discovery Team), all NPDT members should study, understand and agree on what the target customer's needs are. This understanding should be based around the concepts discussed in Chap. 3 (and should subsequently be articulated in terms of these concepts). The technical product's functionality(ies) and attributes should be clearly stated. The Discovery Team's preliminary technical specifications should be discussed and, when necessary, they should be divided into sub-specifications. Ideally, this stage should also take into account things such as: the performance of competing products, and the new product's operating and service conditions.

Identify Generic Subsystems or Technological Components in the Product Design

Based off of the needs and preliminary technical specifications discussed during the previous stage, the NPDT can create an outline of the subsystems that will be part of the future product. The more radical the product concept, the more generic these components. They should initially be regarded as part of a product's 'black box'. See Fig. 6.8. For instance, some of the basic subsystems in an unpiloted aerial vehicle (or drone) used for commercial purposes are: its aerial frame structure, vision system, onboard communication system, ground control system, and autopilot system. At this stage, the NPDT should concentrate on the most important subsystems, the ones that are less technically complex, or those that could be important for developing other subsystems.

Next, the NPDT should break down each process into its component subsystems; initially these subsystems should be ordered sequentially (that is, in the physical order in which they execute their work). For instance, the vision, onboard

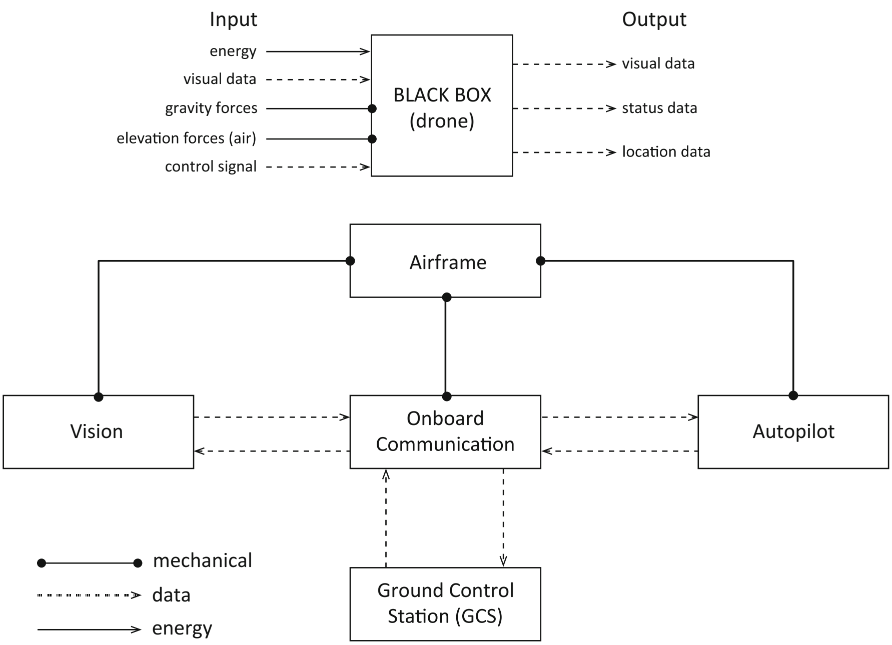


Fig. 6.8 Diagram breaking down the (functional) aspects of drone design. The *top image* represents the operational 'black box' and its corresponding inputs and outputs. The different connecting lines (*arrows*) indicate different types of input and output. The output is closely related to the attributes and functionalities that are required of the product. The *lower image* provides a break down of the black box's required sub-functions—these are the sub-functions that allow the entire product to carry out its job. These sub-functions can be further broken down until all of the sub-functions are simple enough for the NPDT to work with. Adapted from exhibit 7-4, Product Design and Development, Fifth edition. Karl T. Ulrich and Steven D. Eppinger. McGraw Hill International Edition. 2012

communication, and ground control station subsystems are all part of the data communications system. This kind of organization is key—it helps an NPDT assess the compatibility between various technological ideas (concepts) in the subsystems process (see below).

Research Existing Solutions for Each Subsystem

The goal of this stage is to identify and understand past solutions that were used to resolve the technological challenges posed by a key subsystem. However, this doesn't necessarily mean that the solution is a potential option. Here, the objective is for team members to start thinking about different variables that were incorporated into successful products in the past. In doing so, they'll save the development program time and money. For instance, with regards to the 'vision' subsystem described above, an NPDT can research image capturing technology developed for satellites in orbit around the earth. Companies can also look for related technologies by consulting patent databases, technical experts who are leaders in a specialized field, or specialized literature.

In order to help them choose between different types of technologies, the NPDT can use problem-solving strategies such as: Lateral Thinking, TRIZ (*Teoriya Resheniya Izobretatelskikh Zadatch*), Complexity Reduction, Evaporating Cloud, Analogy Generation, Brainstorming, Hypothesis Testing, Divide and Conquer, etc.

Organize Sub-systems into Related Groups

The purpose of this stage is to take the immense number of potential concepts for each subsystem and simplify them. These concepts need to be organized and divided into workable combinations. In order to simplify these concepts, the NPDT should identify the generic technological or scientific classification they belong to. For instance, the following is a list of concepts that have to do with the drone's vision subsystem: HD image capture, UV radiation detection, infrared radiation detection, a radar and sonar sensor, among others. All of these concepts can be classified as 'radiation detection'. At the same time, the subclassification 'UV radiation' is different from the subclassification 'visible radiation'. The NPDT will need to assess whether the radiation sensor is compatible with the data processing technologies in the 'onboard communication' subsystem. Ulrich and Eppinger suggest two tools for this kind of analysis: the Concept Classification Tree, and the Concept Combination Table.[12]

Once the NPDT has come up with different combinations of subsystems, they can create the first sketches or technical drawings of the system. This is shown in Fig. 6.9. Parallel to this, the team can begin the feasibility analysis where they can discuss any limitations in product manufacturing, the availability of certain technologies, logistics, the environment, or product robustness.

[12] Product Design and Development, Fifth edition. Karl T. Ulrich and Steven D. Eppinger. McGraw Hill International Edition. 2012.

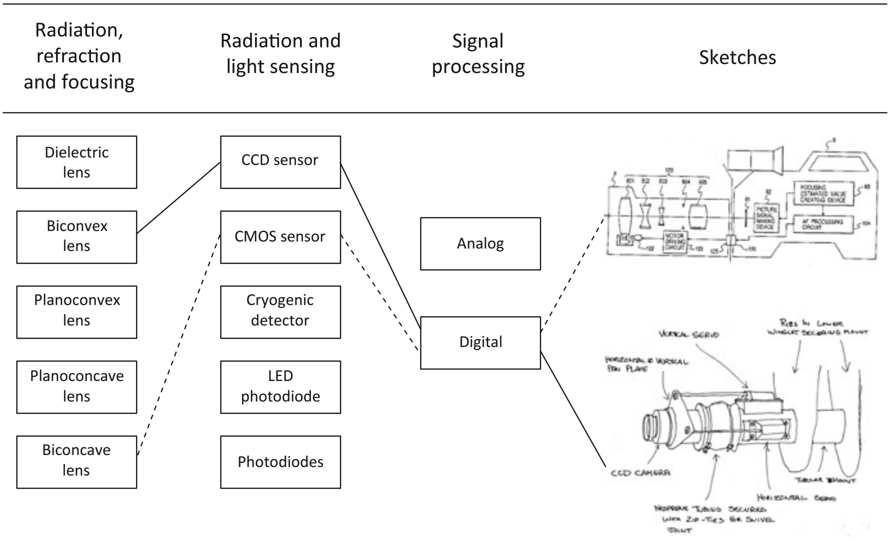


Fig. 6.9 The technical drawings shown above are the result of a Concept Combination Table used to organize a drone's 'vision' subsystem. This diagram shows two possible combinations—they each use a different lens and light sensor system, and they share the same processing system

Concept Selection

During the previous stage of the development process, the NPDT will have identified numerous possible concepts for their potential product. These concepts (shown as sketches) and their respective subsystems may be very different from one another, just as their differences may be more structural than functional.

Choosing between alternative concepts means analyzing and evaluating each potential concept to determine the extent to which it meets target application needs (these will have been identified during market research). The purpose of this stage is to select one or a few concepts for a more in-depth feasibility analysis and further testing to measure each concept's characteristics and performance level.

The basic requirements for a successful selection process are:

- It should be a methodical and structured process.
- It should (always) focus on the pre-established needs of target customers
- It should consider other factors that could affect the success of the product (manufacturing, costs, logistics, environmental factors, etc.). As such, the NPDT should consult specialists in each field to get their analysis and opinion.
- It should assess customers' and suppliers' analyses of the product concept (this refers to customers and suppliers that were chosen to participate in the concept development stage).
- The NPDT needs to be aware that this is still a creative and iterative process. As they discuss various concepts, the NPDT may find themselves coming up with new ideas on how to improve a potential product design.

As mentioned earlier during this book's discussion on the Discovery Team method, in order to properly understand the needs of target applications, a company has to prioritize those needs or specifications. Not prioritizing needs and specifications makes it difficult to choose between concepts.

This chapter proposes a more technical method of concept selection which is meant to avoid biases and unfounded interpretations. A technical product needs to provide functionality and attribute performance and this outweighs any other subjective considerations. Once the concepts have been prioritized, they'll need to be assessed metrically (see below). Yet, it's good to remember that no matter how systematic the selection process may be, there will always be some level of human input that comes from people's experience and intuition.

Since the NPDT will have come up with several different product concepts, their concept selection method needs to be a discriminatory process. This is shown in Fig. 6.10. There are different tools that the NPDT can use to compare their concepts objectively and metrically, and assess how these concepts compare to the prioritized customer needs. The most commonly used tool is the decision-matrix, which takes on different forms depending on the context. Figure 6.11 provides an example of a chart for selecting technical product concepts.

As the reader may have noticed, the matrix shown above doesn't include information about other factors that might make a concept more or less attractive as an

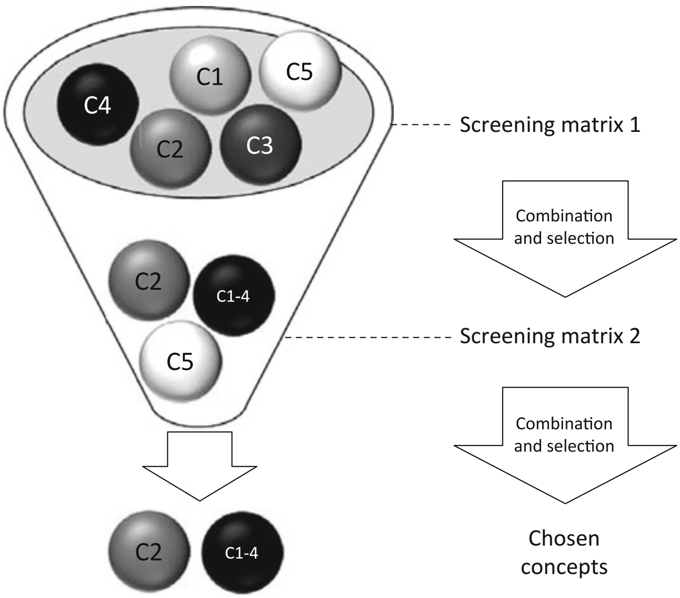


Fig. 6.10 The above image represents the product concept (C) selection process. Concepts developed by the NPDT are put through a discriminatory and structured selection process. Afterwards, a smaller number of more suitable concepts (or combinations of concepts, such as C1-4) are chosen. These concepts will go on to the next stage for further testing

		PRODUCT CONCEPTS									
		Concept 1		Concept 2		Concept 3		Concept 4		Concept 5	
Prioritized customer needs (functionalities + attributes)	Importance weight (%)	Rating (1-5)	Weight (%) × rating	Rating (1-5)	Weight (%) × rating	Rating (1-5)	Weight (%) × rating	Rating (1-5)	Weight (%) × rating	Rating (1-5)	Weight (%) × rating
1											
2											
3											
4											
…											
…											
Etc.											
	Final score per concept										
	Ranking										
	Chosen? Yes/no										

Fig. 6.11 The product concept decision-matrix is a tool for identifying and combining concepts that will progress to the next stage of the process. The left column should list customer needs (these should be expressed numerically) and should identify product functionality(ies) and different types of product attributes (see Chap. 3). In the following column, each need is assigned a particular degree (in this case, a percentage) of relative importance. The NPDT will need to rate each product concept on a scale of 1–5 in terms of how well the concept fulfills a given need. Then, this amount is multiplied in order to determine its total performance value (column Imp × rating). At the bottom of the matrix, the performance values for each product concept are added up. The total performance values determine which concepts are going to be prioritized (this is listed in the row titled Ranking). Finally, the last row in the matrix shows whether a concept continues to the next stage, is combined with another concept, or is eliminated

option (e.g. manufacturability, potential cost, systemic complexity, regulatory viability, etc.). These factors will be assessed during the feasibility analysis, which will be discussed below. Nonetheless, as mentioned throughout this chapter, these different assessment processes can occur at the same time or even in conjunction with one another. In other words, during the concept selection process, a company can begin to take a more in-depth look at product feasibility.

Concept Testing

Competing concepts that were chosen during the previous stage can now be evaluated by a select group of customers and suppliers from the target application market. For this stage, a company may want to create its first product prototypes. These prototypes can be physical and/or analytical (a diagram).

Companies that are chosen to participate in concept testing should be representative of the downstream industrial chain. These discussions should focus on the concept's ability to be commercialized, distributed, integrated, used, maintained, repaired, and recycled.

Naturally, the designer-manufacturer should take legal steps to protect this information; both customers and suppliers need to understand that these concepts are confidential material.

Ideally, concept testing should take place at the customer's facilities. As discussed during the Discovery Team method, whether it's a matter of logistics, integration, or product use, proximity to the future product's operations is important. It creates a more creative environment and it allows people to identify any unexpected obstacles that weren't apparent in the developer's office, factory, or laboratory.

These product concepts will still be far from functional. Yet, just having a group of possible concepts and subsystems will help the NPDT think of ways to adapt these concepts to their future usage environments throughout the industrial chain.

In methodological terms, the chosen customers and suppliers will work together with their own technical and operational personnel (who are absolutely essential for this discussion). Concept testing isn't just about assessment—it's also about being creative and reforming concepts.

Stage N°4. Analyzing the Feasibility and Potential Success of a New Product

As soon as the NPDT decides which concepts make it past the selection process, they can begin feasibility analyses. It's good to remember that in order to choose between concepts, the Discovery Team (Chap. 4), upper management, and the NPDT need to have discussed various facets of general product feasibility. Below, the reader will find a discussion of different factors that need to be considered. These factors have to do with product commercialization, logistics, distribution, technology, standards and regulations.

Commercial Feasibility. The First Checkpoint in the Development Process

A commercial feasibility analysis involves formally assessing market information. This information tells a manufacturer how risky or attractive it is to develop a business based around the potential product. Within the development process, the commercial feasibility analysis is also a checkpoint where the NPDT can decide whether or not to continue a project.

The NPDT can create a sub-team for the commercial feasibility analyses. At the very least, this analysis should consider the following variables:

Size and Scope of the Potential Product's Target Application

The size of the new product's target application indicates how big the total market is for its commercialization and it gives the company an approximate idea of how much installed capacity it will need. At the same time, market size helps a company determine the potential volume of products it can reasonably hope to sell. Naturally, if a product's market potential is too small, a company may decide to abandon the project and avoid further, unnecessary calculations. The NPDT might reach the conclusion that a new product wouldn't generate enough sales to finance its development and introduction.

Earlier, the Discovery Team determined which type of customers need the new product. In that sense, the company already has an idea of which market applications will be interested in the new product. Either the NPDT or the sub-team in charge of the feasibility analysis needs to identify these applications and determine the number of customers for each one. Having said this, a target application can sometimes have a relatively small local market and a considerably large global one. The NPDT should take this into account and it should be reflected in the company's international expansion strategy.

The Economic Benefits to the Customer Metric (EBM)

This metric is essential for assessing commercial viability. As the reader may recall, this metric was established by the Discovery Team during market research activities and it shows how much a customer can save or profit by adopting the potential new product. This tool is important since the results of the economic benefits metric correlate with customers' *intention to adopt* the new product. The NPDT can assume that the more a customer saves or profits from a new product, the greater that customer's purchase intention. Of course, this is only true if the new product meets the performance requirements researched by the Discovery Team and summed up in its *performance metric (PPM)*. The price of the new product shouldn't negate customers' economic gains. If it does and if the new product is only marginally economically significant for the customer, then it's safe for the NPDT to assume that the new product will be risky to commercialize. An example of the EBM is shown in Fig. 6.12.

It's important for the NPDT to consider the benefits a customer could receive from a substitute or competing product. A company shouldn't get fixated on the idea that their product is the only one that fulfills customers' needs or that costumers are considering.

The New Product's Annual Sales Forecast

This volume recommends that the NPDT or a sub-team should consider the following market concepts and data when completing this analysis:

(a) Product life cycle theory (PLC). This is a well-known theory that was introduced in the 1950s. It explains a product's expected life cycle from the time the product is introduced to the time it goes obsolete. This life cycle goes through five stages: development, market introduction, sales growth, saturation (maturity), and decline or obsolescence.

(1) CUSTOMER (company)	(2) THE PROBLEM/NEED statement	(3) DETAILS of the problem	(4) CALCULATION DATA AND VARIABLES	(5) CALCULATIONS	(6) THE COSTS OF THE PROBLEM for the customer ($/time)
Mining Corporation Inc.	Power and control cable breaks frequently. As a consequence, the drilling machine is rendered out of work.	The customer has 6 drilling machines. Power and control cable break every 6 months. Each drilling machine has to be repaired during 5 days. Cause: over bending of the cables	1. Customer's annual production of metal. 2. International price of metal. 3. Customer's production costs per ton. 4. Total downtime of drilling machines.	Operation profits/ year x (total downtime/365)	US$ 22 million/yr

NEW PRODUCT CONCEPT	PERFORMANCE VARIABLES (THE METRIC)	METRIC PERFORMANCE UNIT	AIMED VALUE	ECONOMIC BENEFIT for the customer
Elbowed power and control cable	Operating machine without breaking due to cable bending	months	18	US$14 millon/yr

Fig. 6.12 Example of an economic benefits to the customer metric. The upper table shows a customer's economic losses caused by an identified business problem. The lower table shows the economic benefits a customer could receive by adopting the new product design. This benefit is directly tied to the new product's performance level

Ideally, the NPDT should create a graph such as the one shown in Fig. 4.31 (Chap. 4). This graph depicts the new product's development, market introduction, and sales growth stages. That way, the NPDT will have a better idea of the product's sales performance over time. They'll be better equipped to discuss whether the projected sales performance meets company expectations and whether the project merits further investment. Additionally, this analysis is important for determining whether or not the development project is economically feasible (see below).

In order to make the curve on the graph as accurate as possible, the NPDT should use the economic benefits to the customer metric (see above) as well as the conceptual tools described below in points (b) and (c). Also, they can refer to Chap. 12 of this book, which deals with how to introduce new technical products into industrial markets.

Companies should try to penetrate their markets at a pace that allows them to achieve a dominant market share early on (there are numerous examples that show that this works). Evidence shows that industrial companies with over 30 % market share are able to become functionally profitable, whereas companies with less than 15 % market share tend to lose money.[13]

[13] Marketing High Technology. An Insider's view. William H. Davidow. The Free Press, 1986.

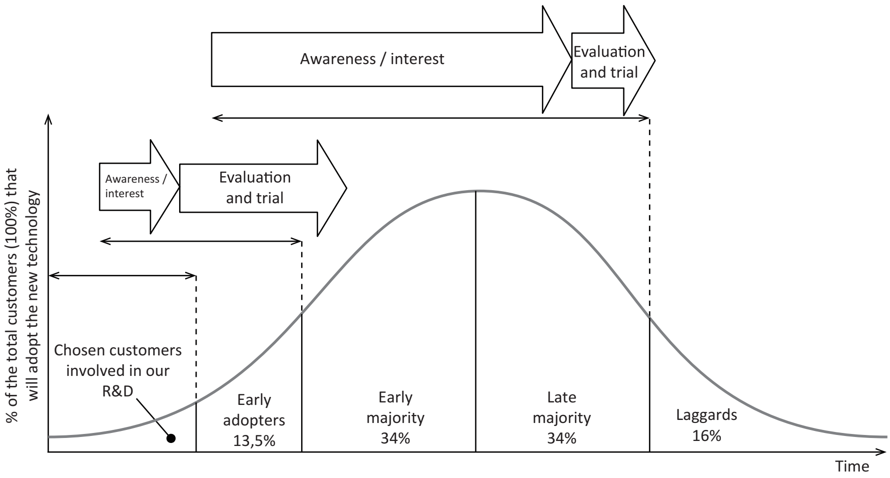


Fig. 6.13 Five categories of product adoption by different types of customers. The *vertical axis* shows the number of customer companies that have adopted the new product, and the *horizontal axis* represents time. The name of each adoption category is included in the graph, as well as the percentage of customers that belong to each one

(b) The Francis Bourne model which describes different categories of new product adoption.[14] The graph in Fig. 6.13 gives a detailed picture of what occurs during a new product's introduction and sales growth stages.

According to the adoption categories model, *innovators* make up 2.5 % of the total number of customers. *Early adopters* make up 13.5 %, and *early majority* customers make up 34 %.

Additionally, there are some historical precedents that can help guide the NPDT when it comes to new technical product introduction. These precedents show that:

- It can take a new technical product between 5 and 10 years to reach the *early majority*.
- If the new product is expensive, then *early adopters* are probably going to be large industrial companies.
- Generally, the *early-adopters* are the companies that are most in need of the new product.
- *Early-adopters* spend more on R+D and they are managed by younger and better educated people.

(c) Databases from capital expenditure projects where the new product could potentially be used. The vast majority of industrial products are bought for specific capital projects. These projects might consist of a new factory, expansion of a mining site, a new car design, a new highway, etc. Normally, these projects are legally required to obtain construction and operation permits from the rele-

[14] The Adoption Process. The Adoption of New Products. Bourne, Francis, S. Arbour, A., Foundation For Research on Human Development pp. 1–8, 1959.

vant authorities. These permits usually concern environmental, municipal, or regional regulations (among others). As a result, it's fairly easy to access databases belonging to future capital projects. These databases contain important information for future suppliers and they help suppliers assess the commercial feasibility of their new product. This is because the number of future industrial projects where the new product could be used indicates how much subsequent demand there could be for the product.

Naturally, just because there are capital projects where the new product *should* be used doesn't guarantee that customers will be racing to go buy it. The NPDT should adjust its estimated rates of product adoption based on the behavior of innovative and *early-adopter* companies (see part b in this section's discussion on product life cycle).

The Structure of the Downstream Industrial Chain and Potential Commercial 'Bottlenecks' That Could Affect the New Product

For the next step in the commercial feasibility analysis, the NPDT or the sub-team should create a diagram of the new product's downstream industrial chain. Figure 6.14 provides a classic example of an industrial chain.

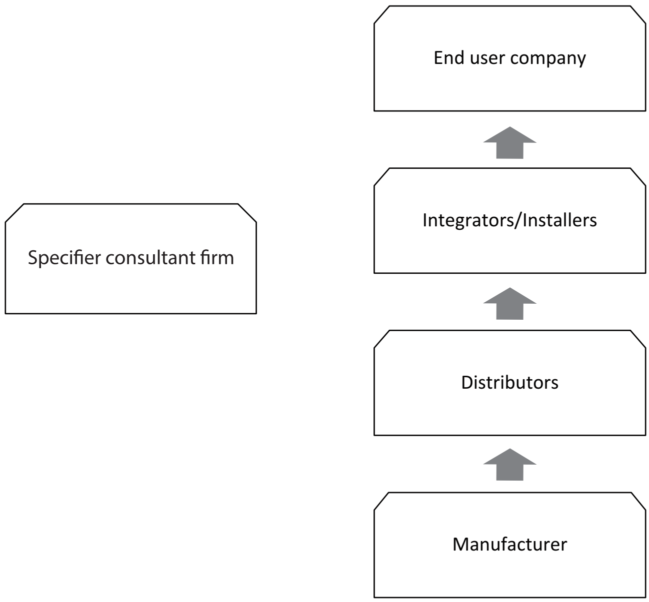


Fig. 6.14 Example of a generic industrial chain. The length, extent, and companies in an industrial chain vary considerably from case to case. In order to assess a new product's commercial viability, the NPDT should diagram its downstream industrial chain toward the end-user. This allows the NPDT to anticipate any serious systemic or structural obstacles prior to production

The industrial chain diagram serves as a map for the NPDT. The team can use this diagram to anticipate any structural factors in the market that could threaten the commercialization of their new product. These can be thought of as 'bottlenecks' in the industrial chain.

Sometimes, these bottlenecks occur during the new product's assembly/integration stage. Other times, they're due to a lack of suitable distributors. And, lastly, they can also be caused by independent product specifiers that lack the relevant knowledge. The NPDT needs to remember that if any company in the industrial chain is underdeveloped, this can seriously slow down the new product's sales growth.

The Ease with Which a Product Can Be Imitated by Competitors

Generally speaking, if a product is easy to imagine, easy to design, and easy to manufacture, then competitors will find that it's a good and quick product to imitate. This is especially true if the product has been successful with customers. This is what happens to simple products, products with a short time-to-market, or products that have been improved and then sold as new products.

In his legendary book, *Positioning, the Battle for your Mind*, Jack Trout argues that one of the sacred dictums of company positioning is that a company should 'always be the first one' to launch a new idea. Despite this, however, an industrial manufacturer should seriously consider whether introducing a new product is going to be good for their company's image and reputation. Not all new products are as important as others for improving a company's competitive position. For some manufacturers, acquiring intellectual property patents is a necessary first step for selling a product. Yet, doing so is a bureaucratic process and, on occasion, an incredibly slow one.

On the other hand, there are costs associated with product development and introduction (see economic feasibility). A company might not see returns on its investment if its competitors are quick to imitate the product, or even improve it.

On the whole, what the industrial marketing strategist and the NPDT need to realize is that successful products will *always* be imitated by competitors. Sometimes, competitors will even introduce cheaper versions of the same product. However, when this occurs, a proactive NPDT will already be working on developing a new version of the product. Thus, although companies are frequently advised to be the first to introduce a new technology, the advice shouldn't end there: companies should also strive to be the best possible alternative.

The Final Report on Commercial Feasibility. Checkpoint for Deciding Whether to Continue a Project

The last step in the commercial feasibility analysis is to write up a brief report. This report should review all of the facts, assumptions, and concepts that the team has used to arrive at one of two conclusions: either the project continues or it doesn't.

By now, the NPDT or its sub-team will have analyzed a wide range of concepts, including the size of the target application, the potential product's life cycle, the number of *early-adopter* customers, information from current and future capital expenditure projects, and the potential structure of the product's downstream industrial chain. Given this, their arguments for or against a project need to be completely thorough and convincing. Different companies will use different standards to determine whether or not a project gets approved. It all depends on the company's business objectives, strategic guidelines, financial sensibility, customers' perceptions of a supplier's reputation, among others.

While some companies don't turn up their noses at small applications, they may find that capital costs keep them from continuing a project that requires a long product introduction period (product cycle).

Other companies can afford to develop products with long introduction and growth stages, yet may decide to abandon a project if the target application size is too small.

Then again, other companies may decide to opt against products that are easily imitated by competitors. These companies will need a more complex product portfolio, technological exclusivity from suppliers, and a more sophisticated method for dealing with product life cycle.

Technological and Production Feasibility: The Second Checkpoint in the Development Process

A new product idea can seem promising and it may fill a need in an attractive market. Yet, inevitably, it still has to be put through a very practical discussion: given the company's current availability, competences, and capabilities, is the company able to produce the product?

There's a close correlation between a revolutionary new product idea and the need for cutting-edge technology to develop it.

Of the many types of feasibility analyses, technological and production feasibility is bound to generate a lot of conflicting opinion amongst company personnel. The reason for this is simple: this is a familiar and everyday issue for the company. After all, this type of analysis is about production, raw materials or components, protocols, personnel capacity, etc. In other words, once this type of analysis gets underway, a new development project could face premature and powerful opposition from company members. Some of the reasons people dismiss new product ideas are:

- The complexity of operations management. In a lot of industrial companies, the operations managers spend their time dealing with crisis and resolving specific issues for specific customers. Production managers that aren't on the NPDT can get used to being real naysayers. Inevitably, questions come up: When? With who? Are we able to do this? How much will it cost?

– Production capacity. A lot of production plants respond to market demand by attempting to manufacture products at the lowest cost per unit possible. Not to mention, making sure goods are delivered on time can often be stressful for operations management. Either way, there's bound to be a growing list of reasons why 'there's not enough production capacity', or 'we don't have time to test production protocols for a new product', etc.
– A company lacks the ideal kind of personnel—people who can research different technical suppliers/partners in order to find the right technology. Quite often, new ideas require technologies or scientific knowledge that the manufacturer is unfamiliar with. Eventually, these will have to be incorporated into the future product's design. A company will need to study these technologies and research as yet unknown (and perhaps international) suppliers in order to find the right one.

In order to deal with these kinds of reactions (which are normal in companies that aren't used to new product development), a company will need strong leadership from its higher-ups. The NPDT should make sure that the chief operations officer is involved and excited about the project. Quite often, people's resistance to product development has to do with other spoken or unspoken incentives that take away from their initiative.

Regardless, the technological and production feasibility analysis should examine the following points:

What Raw Materials, Components, and Suppliers Are Needed in Order to Manufacture the New Product?

When it comes to figuring out which technologies the new product will use, the first step is for an NPDT to research whether this product concept has already been produced in some part of the world. Some multinational companies use their global offices to research whether a given technological problem has already been solved.

Based on how novel and/or complex the new product is, the NPDT will decide how much to invest in learning about the science behind the necessary materials and components. In this regard, it's advisable to do technological research—a company should familiarize itself and understand materials and components that are different from the ones it normally uses.

Doing an exhaustive search requires a positive attitude, effort, and motivation. If a company doesn't know much about what technological possibilities are out there, then they may need to contract external engineers or scientists. The NPDT should always remember that the purpose of a new technology is to satisfy customer needs, their metrics and the specifications researched and outlined by the Discovery Team. With the above in mind, a company should hold brainstorming sessions with NPDT members, the operations manager, the head of R&D, and technical consultants. Eventually, a company may want to invite suppliers (or potential suppliers) to participate in these sessions. This will help a company learn about the technologies they require and about those technologies' availability.

Assessing the Reliability, Performance, Cost, and Volume Availability of the Technologies Needed to Develop a Product

Once the NPDT has identified different technological alternatives that can be used for the potential product, they'll need to ask themselves some important questions:

Is the technology available in the volume required?

Is there a logistics design that suits our procurement needs?

How will these technologies perform under new environmental conditions? (These environmental conditions will have been identified by the Discovery Team).

What are the costs of obtaining these technologies? How will these costs affect the final price of the product?

Sometimes, a manufacturer will need a technology that isn't available unless a supplier decides to develop it. This is an opportunity for a manufacturer to collaborate with a supplier on a development project; both parties should sign a confidentiality and partnership agreement. Protecting the intellectual property of the developed product is a crucial part of this process. As such, a manufacturer needs to make sure that the supplier abides by a confidentiality agreement; this helps prevent technological data from leaking to competitors. It's good to remember that if a developed product turns out to be successful, then the supplier will want to sell more of their product to other potential customers.

Collaborating with Other Businesses on Technology Transfer

In order to develop a new product, a manufacturer-developer may need to partner with one of its suppliers. From a logistics standpoint, the *just-in-time* method exemplifies a very high level of business collaboration.

A company's need for collaboration may lead them to form partnerships with institutions that are neither customers nor suppliers. These institutions might be entities or business organizations whose technology will be integrated with the company's own technology. Sometimes, the end product can't be manufactured unless these different organizations communicate with one another. For instance, in order for a new capacitor to function properly in a medical x-ray machine, a capacitors manufacturer may need a transistor manufacturer to develop a new product.

In this sense, it's crucial for the NPDT to have an understanding and awareness not just of their own component product's functionality, but of the functionality of the finished product as well (for more details, see Chap. 3).

Necessary Conditions for Production

This is when the NPDT determines manufacturing requirements for the new product. They'll need to assess the following:

Infrastructure requirements: The range of these needs is entirely determined by the nature of the product. A company might need an entirely new production plant, or they may need to reinforce the capacity of their current one. The NPDT should also assess expanding their plant, plant design and layout, energy supply, etc.

Necessary production equipment: The NPDT should determine whether they'll need any new production equipment and, if so, the equipment's initial cost, operating costs, and expected performance level.

Manufacturing and assembly procedures: at this point, the NPDT should assess the requirements or difficulties of the new manufacturing protocols. Also, they should determine how other production lines will be affected by production of the new product.

Necessary skills and personnel: depending on the nature of the new product, its manufacturing procedures may require new personnel, new competences, or both. In less complicated situations, a company can simply train its plant operators on the new manufacturing procedures.

The Final Report on Technological Feasibility. Checkpoint for Deciding Whether to Continue a Project

Once the NPDT has analyzed the capacities, competencies and availability described above, they'll be able to arrive at one of three conclusions: either the project continues, or it doesn't, or it's put on stand-by. Insofar as this last option, it's important to consider that, as opposed to commercial feasibility which hinges on certain quantifiable factors (such as 'objective market size'), the technological and production feasibility analysis may conclude that more time is needed in order for a supplier or strategic partner to develop their own technology.

By putting a project on *stand-by*, a company acknowledges that the product idea exists, is a good idea, and that, according to other feasibility analyses, it merits further development. However, there's still some technological component that's not mature or stable enough and therefore requires more time.

Regulatory Feasibility. Checkpoint for Deciding Whether to Continue a Project

Regulatory feasibility means assessing the future product's characteristics and performance level against the backdrop of any de facto or legally binding technical standards.

Technical standards, or norms, are usually developed by independent agencies and they outline the criteria that need to be met by products, designs, methods, processes, and practices.

The purpose of standardization is to prevent threats to public welfare, public safety, and the environment. It also serves as quality control and provides industrial criteria for comparing technical products and services.

Some examples of regulatory bodies are: ISO (International Organization for Standardization), ASTM (American Society for Testing and Materials), CEN (*Comité Européen de Normalisation*), DIN (*Deutsches Institut für Normung*), etc.

If there are any existing technical standards that govern the product category in question, then the NPDT needs to make sure that the new product conforms to them.

In this regard, it's worth highlighting a subtle, yet important, difference in revolutionary product development: it's one thing to *comply* with the norms and it's quite another to *stick to* them. By complying with technical standards, a new product can still provide benefits greater than those dictated by regulation—and this is precisely what a revolutionary new product is supposed to do.

By sticking to the norms, a new design limits itself to the technical specifications outlined by regulation. As such, the new product probably won't perform that much better than an existing one.

Is it possible to comply with technical standards and still create a revolutionary new product?

Of course it is!

If technical standards are well-thought-out (remember: these standards are devised by human beings), then they establish a minimum, or hygienic base, for a product's characteristics and performance level. Given that progress is constantly being made in materials science, procedures, and engineering, it would be pointless for a regulatory body to set the maximum for a product's characteristics and performance level. In fact, advances in science and engineering are generally responsible for modernizing technical standards and not the other way around.

In any case, the NPDT needs to be absolutely certain that the new product design doesn't conflict with established technical standards. In order to do this, the NPDT needs to take the following steps:

Identify Any and All Standards Pertaining to the Product and the Product's Supply Chain

Not only does the NPDT need to familiarize itself with the technical standards governing a product's characteristics, but it also needs to identify any product performance standards that regulate its installation, commercialization, transportation, storage, and use. It's not enough for the NPDT to make sure that the product's characteristics and performance level comply with norms—if it turns out that the product conflicts with transportation or installation standards, then the whole project is at risk of failure.

Review Any Market-Specific Product Standards

The NPDT should take the time to review and compare any relevant product standards. This can seem like a tedious thing to do, especially since the product may end up being commercialized in different countries with different standards. Quite often, the NPDT ends up discovering some overlooked detail that could put the new product's commercialization at risk. Sometimes, a single word included in a technical standard can put an entire design project on hold.

Checkpoint for Identifying Any Conflicts Between Product Design and Current Standards

It's a good idea to create a checklist of any standardized product requirements that could conflict with product design. During the product design stage, the development department should review this checklist and incorporate this information into their product concept. This keeps a company from wasting its time unnecessarily since, otherwise, these issues would just come up during standards testing (see below).

Regulatory Feasibility Analysis

As the NPDT advances through the design, testing, commercialization, installation, and product use stages, they'll constantly be testing a product's regulatory feasibility. This is the deciding moment in this feasibility analysis. If major conflicts exist, then the NPDT needs to decide whether those conflicts can be overcome or, alternatively, whether resolving them would take up too much of a company's time and resources.

The Final Report on Regulatory Feasibility. Checkpoint for Deciding Whether to Continue a Project

Once the NPDT has assessed any possible conflicts between the new product design and target market standards, they'll be able to arrive at one of three conclusions: either the project continues, or it doesn't, or it's put on stand-by. The decision to put a project on stand-by depends on how much the product conflicts with technical standards and how attractive the product idea is. The reason for this is that, depending on the technologies available, technical standards can always be revised and improved. Effectively, the manufacturer will have to decide whether they're willing to collaborate with a regulatory agency in order to revise the standard(s). Naturally, this can be a very bureaucratic and time-consuming process. What's more, the new product idea could easily be leaked to competitors.

On the other hand, customers may be willing to overlook the fact that a product conflicts with *de facto* standards—of course, this assumes that the conflict doesn't pose any risks to people, company assets, public welfare, or the environment. In these kinds of situations, neither the customer nor the provider wants to spend their time waiting for bureaucratic processes to change the standard. Both parties recognize that the new product provides benefits that far outweigh those of the old product.

Logistics and Distribution Feasibility

Whereas regulatory feasibility focuses on the compatibility between a new design and its technical standards, logistics feasibility assesses whether a product meets customers' logistics needs and whether those logistics needs can be reasonably implemented. Here, the understanding is that while technical standards provide a hygienic base for a product, customer needs may require a higher level of performance. It's important not to confuse these two concepts.

Logistics Feasibility Consists of the Following Stages:

Checkpoint for Determining Customers' Logistics Needs

This is not the same as revising all of the target customers' logistics and distribution needs—which, in itself, is a very demanding and time-consuming process that takes place during the product introduction program (see Chap. 12). Rather, it involves creating a checklist of any possible hurdles that could come up during product commercialization or installation. This checklist should be thoroughly discussed and reviewed—the goal is to identify any possible obstacles that could stand in the way of proper product logistics.

Figure 6.15 provides an example of a very simplified logistics checklist. This checklist includes variables such as: optimal delivery times for the new product, the product's relationship with other complementary products, the minimum volume

VARIABLES TO CHECK DURING THE LOGISTIC FEASIBILITY OF A NEW PRODUCT DEVELOPMENT					
			Yes/ No	Define and explain constraints	Possible solutions
1	Constraints to the required delivery time of the product	Discuss the appropriate delivery times (hours/days/months) of the product upon obtaining a purchase order			
2	Constraints to the required quantity of the product per project	Discuss the minimal or maximum volume requirements per distribution channel or customer			
3	Constraints to the installation or integration of the product	Discuss the possible limitations to the installation or integration of the product			
4	Transport constraints (inter companies)	Discuss the minimum requirements for a safe and functional transport of the product at the customer's facilities			
5	Transport constraints (intra company)	Discuss the minimum requirements for a safe and functional transport of the product between companies			
6	Constraints to the required storage of the product	Discuss limitations to the shape, format, duration and environmental conditions of the product storage			
7	Constraints to the required packaging and identification of the product	Discuss the appropriate conditions to protect the product, the people and assets while being manipulated and transported. Discuss identification limitations and packaging re-cycling			
8	Constraints to the required re-cycling of the product	Discuss limitations to the product re-cycling and possible environmental hazards			

Fig. 6.15 Example of a very simplified logistics checklist for a new product. This checklist isn't a substitute for logistics planning and implementation (itself a part of the new product introduction program). The purpose of this checklist is to identify any obstacles that could potentially risk the success of a new product

required by the industrial chain, transportation, storage, technical packaging, and recycling.

Of course, the NPDT can delegate this responsibility to a sub-group of logistics department personnel. The NPDT or the sub-group will base this checklist off of the product concept, and the product metrics and specifications outlined by the Discovery Team.

Types of Product Distribution to End-Users

Furthermore, the team needs to identify any distribution requirements in the future product's supply chain. This can be incredibly important for determining a project's economic viability.

The graph in Fig. 6.16 is a tool for discussing different types of distribution. This graph shows four possible distribution options which are determined by two variables: 'geographic dispersion of end-users' and 'number of end-users'. The four possible options are:

- High geographic dispersion and a high number of end-users: this requires a company to distribute a product through *ad hoc* distributors. A company's ideal distributor (that is, whether it's a specialized or general distributor) depends on the company's strategy and the technical nature of the product (see Chap. 9).
- Low geographic dispersion and low number of end-users: this means that a manufacturer is dealing with a small number of geographically concentrated customers. Given the nature of this market, a company doesn't need to go through intermediaries and can distribute their product directly to customers. The exception is when, due to the nature of the product, end-users require quick and easy access to spare parts or repair/maintenance services. This is discussed in more detail in Chap. 9.
- High geographic dispersion and low number of end-users: in this instance, a company is dealing with a relatively small number of end-users that are geographically dispersed. Odds are, a company will opt for a distribution model that involves direct sales and express shipping. The exception to this would be if a company has significant after-sales commitments (such as maintenance or repair services).
- Low geographic dispersion and high number of end-users: this occurs when a company has a large number of customers that are all geographically close to one another. In this case, a company can use a local distributor or establish their own branch distribution point.

Choosing the right distribution model has a lot to do with a project's economic feasibility, which will be discussed below. Whenever possible, it's cheaper to sell directly to customers than it is for a company to establish distribution branches in different geographic locations. However, a company may have no choice but to do so if that's what the market requires.

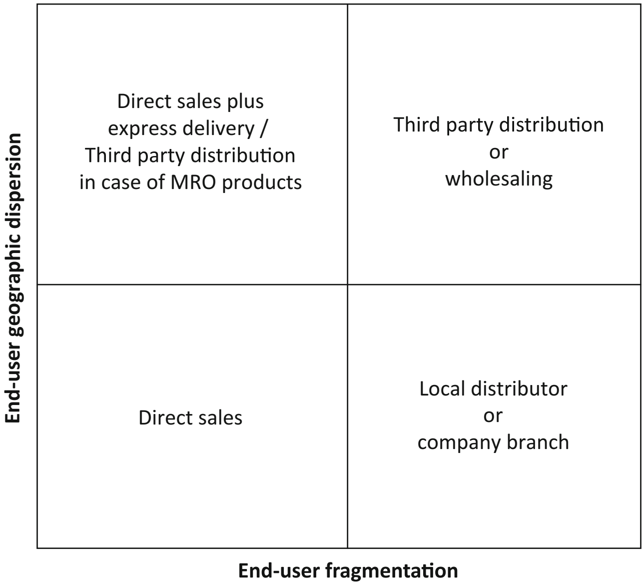


Fig. 6.16 This graph helps companies determine what type of distribution to use. The variables 'geographic dispersion of end-users' and 'number of end-users' lead to four possible distribution models for a future product. These four options have different implications for a project's logistics and economic feasibility. *Note*: this tool does not account for the distribution needs of products that are co-assembled or co-manufactured

This graph only applies to products that aren't co-manufactured or integrated into a distributor's facilities. For instance, the latter would include: cutting and assembling industrial hose fittings, mixing colors in order to create a paint sample or code, etc.

The Final Report on Logistics and Distribution Feasibility. Checkpoint for Deciding Whether to Continue a Project

Just as in other feasibility analyses described above, the NPDT or the sub-team in charge of logistics have to compile a final report. The team needs to decide whether to continue the project, abandon it, or put it on stand-by. Inevitably, the logistics checklist will be one of the most extensive and difficult checklists in the entire development project. Regardless, it has to be done thoroughly with a lot of attention to detail. If a company fails to spot a basic logistics hurdle (such as a highway weight limit), then they risk the success of their entire project.

Once again, the development project can be put on hold if there's some unresolved logistics issue that means the market isn't ready for the new product. In these kinds of cases, a company can try to overcome the obstacle either through direct involvement or through some third party institution.

Economic Feasibility

Assessing a project's economic feasibility means using quantitative and qualitative tools to determine the difference between the costs and benefits of researching, developing and commercializing a product.

Cash flows (that is, cash outflows and inflows) are the most established quantitative tool for measuring economic feasibility. Cash flows take into account investments in research, design and product development, sales over time (once the product is introduced), and the costs incurred from manufacturing, logistics, marketing, sales, and administration.

There are qualitative tools that assess a project's strategic impact on the company as a whole or on one of the company's business units.

Either way, just as in other feasibility analyses, the NPDT or upper management need to discuss whether to continue a project, abandon it, or put it on stand-by while they wait for an issue to be resolved.

As soon as a development project begins, the NPDT can start gathering information for the economic feasibility analysis. Regardless, the NPDT won't be able to do a thorough economic feasibility analysis until the product concept is clearly laid out and the rest of the feasibility analyses have been completed. For instance, during the logistics and distribution feasibility assessment, a company may realize that they need to set up distributors and integrators in the downstream industrial chain. The cost of setting up distributors and integrators (as well as the operating costs) is not insignificant and, undoubtedly, would have a quantitative affect on the entire project's cash flow performance.

This chapter won't be dealing with how to map out cash flows. Each company has its own unique criteria for financially evaluating its projects. Nonetheless, the following is a list of different activities that can be used to assess the future cash flow for market research, development, introduction, production, commercialization, and new product administration. See Fig. 6.17.

The cash flow sensitivity analysis needs to take into account that important trade-offs will inevitably occur between different aspects of a project. Some variables that are often interrelated are:

- The time it takes to develop a product
- Product performance
- Product robustness
- Product cost
- Product developments costs

For instance, a more robust product could be more time-consuming and costly to develop. Or, a shorter development period could negatively impact on the cost of a product. In turn, these types of trade-offs can have a direct impact on a product's price or on the volume of products sold. As such, it's the NPDT's job to learn about these effects and make strategic decisions about the project's economic sensitivity.

MARKET RESEARCH INVESTMENT ASSOCIATED TO THE PRODUCT DEVELOPMENT
- Discovery team costs - Travel costs - Indirect costs (supervision)
PRODUCTION COSTS
- Components and raw materials - Assembly (direct costs and learning curve) - Energy - Tooling - Indirect costs
PRODUCT DEVELOPMENT INVESTMENT
- Product development team (on average 80% of the development project) - Materials - Equipment and software - Documents and documentation (standards, patents, etc.) - Prototyping - Legal counseling - Permits and licenses - Testing - Indirect costs (supervision)
MARKET LAUNCHING COSTS
- Market introduction team - MARCOM costs - Logistic investments and costs - Distribution costs (contracting, training, stocking, commissions) - Cost of sales (training, commissions, travel costs, sales people costs) - After-sales costs - Indirect costs (supervision)

Fig. 6.17 This table shows four basic categories. These can be used to map out cash flows and financially (and quantitatively) assess the development and sale of a new technical product. A company should include each of these categories in its cash flow timeline before carrying out a sensitivity analysis. For more information on the costs associated with market research, see Chap. 4. For more information on the costs associated with new product introduction, see Chap. 12

For a company, this is a crucial part of their learning process—it helps them understand the effects, both large and small, of choosing one thing over another.

On the other hand, the economic feasibility analysis should also consider some qualitative variables that are harder, and sometimes impossible, to express in terms of cash flow. Some of these variables concern the following:

- What an organization learns from a development project
- A project's technological influence on the rest of a company's products
- The effects of cross-selling the product with other products and services
- Its affect on the prices of other company products and services
- Its affect on the sale of other products to customers who have adopted the new product

– Competitors' reactions, either in the target application market or in other markets where a company's products are used (competitors may retaliate)

Figuring out a new product's sales over time is one of the most difficult parts of an economic feasibility analysis. A product's future sales depend on how attractive the product is for the customer (this can be inferred through the economic benefits metric), the pricing strategy, competitors' behavior, the performance of substitutes, how well the overall economy is doing, the number of projects on the market that could potentially use the target application, the quality of a company's commercialization, the credit lines available to customers, logistics performance, etc. Through the economic benefits to the customer metric (see Chap. 4), this book has tried to provide companies with a greater degree of certainty. This metric is an important indicator of how attractive a product will be for customers; as such, it gives companies a more solid framework for simulating future sales flow.

Stage N°5. Determining Product Architecture

Product architecture refers to the identification, format, and physical layout of a product's functional elements and components. Two important aspects of product architecture are: the degree of modularity or integration in a product's subsystems, and the rationalization of the interactions between subsystems.

A modular architecture (e.g. components of a PC, such as the hard drive, motherboard, or power supply) consists of individual parts, each of which have their own specific functionality within the product as a whole. Individually, each of these parts can be developed, changed and refined over time. For products with a modular architecture, there's frequently a trade-off between performance and flexibility.

Integrated architecture (e.g. chemical blends, certain smartphones, etc.) describes a product whose functionality is built into more than one individual component. This puts limits on manufacturing flexibility and after-sales services since a change to one component requires changes to other, additional components. The benefit of integrated architecture, however, is that products tend to perform better since all of their components are made to provide a specific functionality.

The degree of modularity in a product's architecture has dramatic implications for a company's marketing plans. For instance:

– The administrative complexity of the development project
– The speed of new product development
– How quickly the new product can be introduced into the market
– Manufacturing costs
– Logistics and distribution (supply chain) costs
– How easy it is to provide maintenance or repair services for the product
– The product's adaptability to different environments and market applications
– The standardization of components that are used in several different company products
– A product's functionality and attribute performance during usage

For companies that export their products to different markets, each with different sets of needs, the modularity or integration of their future product is hugely important. The supply management strategy known as 'postponement' is incredibly effective at reducing costs and simplifying distribution and commercialization systems. With postponement, a product's modules aren't adapted (or, assembled) until the very last stage of its manufacturing and logistics processes; only then is the product adapted to fit different designs and different market applications. This is shown in Fig. 6.18.

Interestingly enough, industrial marketing personnel are the ones that really have to understand this concept. This is because depending on the needs of different target applications, a product's architectural design will require either greater or lesser degrees of postponed modularity.

Over the past 20 years, the academic community has held an intense discussion on the modularity or integration of different product categories. For instance, as a product design evolves towards architectural modularity, its logistics becomes considerably less expensive. This assumes that as a product becomes more

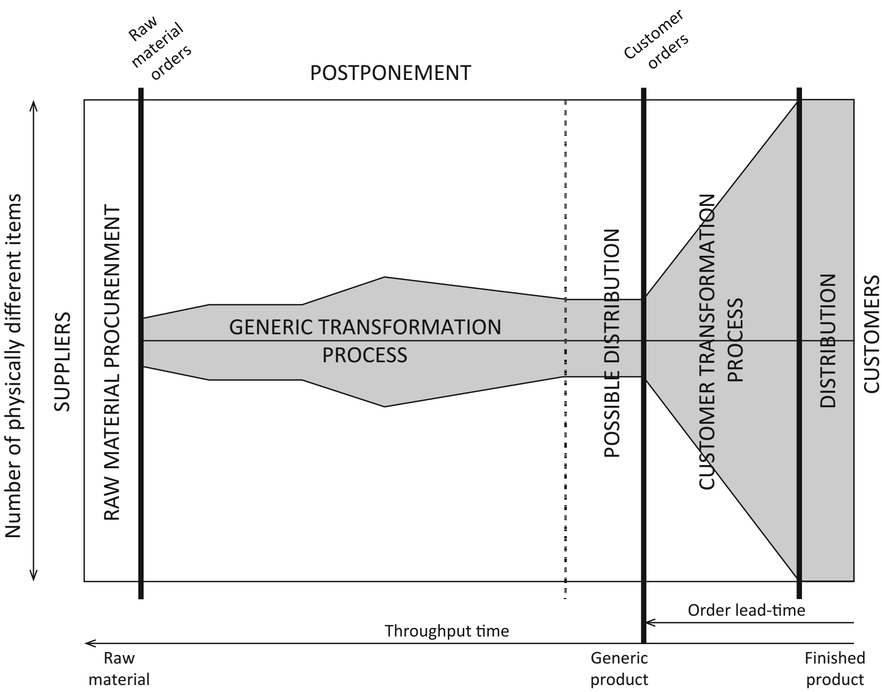


Fig. 6.18 Postponement is a logistics strategy that significantly reduces the number of components that are initially assembled during the manufacturing process, simplifies and lowers the cost of transport and storage, shortens delivery times, and allows for more precise product-application specialization. This could be a good business strategy for large volume businesses whose markets require several variations of a single product design. *Source*: SKIPWORTH, H. and HARRISON, A., 2004, Implications of Form Postponement to Manufacturing: a case study, International Journal of Production Research, 42 (10), pp. 2063

commoditized, it has a greater chance of success if its architecture becomes more modular.[15]

There are other reasons for a company to design products with greater modularity. For instance, a supplier's product may be a component in another manufacturer's design.

However, in other instances, the market may create a demand for products with a higher degree of functionality and attribute performance. Here, the evolution towards greater modularity may reverse course, and instead move towards a more integrated product design. There are documented cases in which the move towards integration creates a product with an improved or new level of performance (new functionality or attributes), which is then welcomed by new market applications.

In designing a product's architecture, the first step is to diagram a product's physical and functional blocks. In laying out these blocks and grouping them together, marketing, production, and logistics personnel will be able to discuss what their modularity strategy is. Ideally, the different architectural designs should reflect the sequential order of a product's functional process. This helps minimize the distances between different stages of the process. Naturally, a company will want to avoid any undesired interactions between product parts (e.g. vibrations, electromagnetic interference, humidity, temperature, etc.).

Through these discussions, the NPDT will be able to create visual representations (ideally in 3D) depicting the geometry and approximate dimensions of the product and the product's components. The NPDT may come up with several different architectural designs for each product concept.

Stage N°6. Things to Consider in the Design for Manufacturability and Serviceability

During Stage 6 of the general product development process (shown in Fig. 6.4), a company addresses what is known as design for manufacturability (DFM). Design for manufacturability deals with all of the issues that have to do with minimizing future manufacturing and logistics costs (these issues will have come up throughout the development process). The design for manufacturability shouldn't jeopardize the product's quality and robustness. The product concept and design play a huge role in future operational, manufacturing, and logistics costs—in fact, compared to all of these, the initial cost of developing a product concept and design are remarkably low. This is shown in Fig. 6.19.

An early focus on DFM can have a significant, and sometimes decisive, impact on the success of a project. If it's done properly, DFM should consider the following:

– Cost of product components
– Cost of assembly
– Indirect production costs

[15] The Innovator's Solution: Creating and Sustaining Successful Growth. Clayton M. Christensen, Michael E. Raynor. Harvard Business Press. 2003.

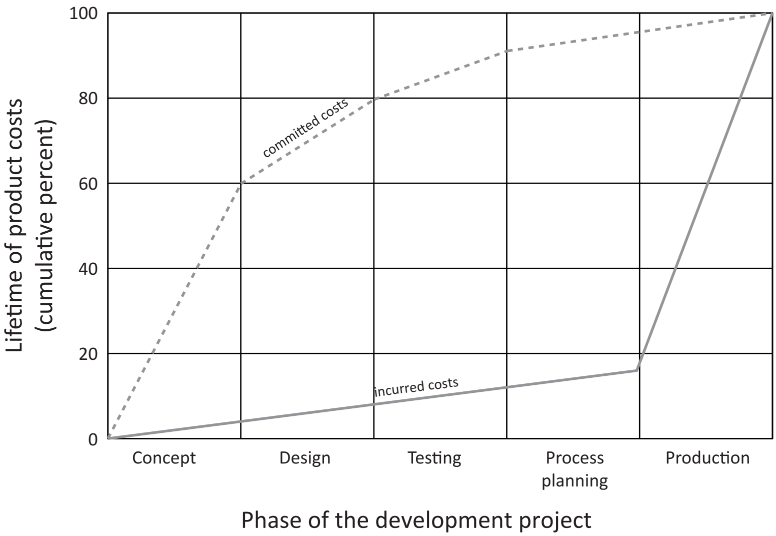


Fig. 6.19 The above graph shows how the initial stages of a development project impact upon a product's production costs during its life cycle. Paradoxically, the concept and design stages (which is when a design is chosen for manufacturing) are proportionally less costly. *Source*: Design for Manufacturability: How to Use Concurrent Engineering to Rapidly Develop Low-Cost, High-Quality Products for Lean Production. David. M. Anderson. Productivity Press 2014

The techniques and variables used in DFM are constantly changing. As such, there are some basic principles to DFM that the NPDT can use as a guide.

– Reduce the number of parts: this simplifies the assembly process, lowers the cost and complexity of inventory, and shortens delivery times.
– Avoid narrow tolerance ranges: this is because the manufacturer's machines and tools will have their own tolerance ranges.
– Choose wisely which materials to modify: some materials can be modified more easily than others, and are better at withstanding changes in tension and temperature that occur during manufacturing processes.
– When convenient, increase standardization: this reduces the number of parts per product and allows certain parts or components to be used for several different products. This creates economies of scale.
– Discuss the right type of procedure: for high-volume parts, a company should opt for techniques that involve extrusion, molds, or forging. This lowers machining costs.
– Opt for more commonly used shapes: this reduces the number and variety of tools, and it makes it easier to find suppliers that provide sufficient volume at a lower cost.
– Properly identify product parts: this avoids confusion or assembly errors, all of which add to costs, lengthen the delivery time, and potentially damage product quality.

- Product components should be easy to handle, identify, and orient: product components and parts should be designed so that they're easy to handle and assemble correctly (in the proper orientation). Otherwise, this adds to costs, lengthens the delivery time, and could potentially damage the product quality.
- Use conventional dimensions: this applies, for example, to drill holes, length, width, and height.
- When convenient, integrate product parts: this reduces the number of parts and, as a result, it reduces the complexity, time, and personnel required for assembly. Not to mention, integrated components are less expensive to manufacture than their modular counterparts.
- Keep manufacturing personnel to a minimum: this reduces both direct and indirect manufacturing costs. The greater the number of personnel, the more supervision and human resources management a company requires.

Despite all of this, however, the NPDT needs to make sure that they don't impinge upon the specifications required by target application customers, nor on the product's overall robustness and integrity. Above all, the product design is meant to serve the customer, not lower a company's costs.

Design for serviceability (DFS) is about reducing the complexity and costs of maintaining and repairing a product during its service life.

A good product isn't a product that's easy to maintain or repair. A good product is a product that requires less maintenance and breaks less often.

The NPDT knows that no product lasts forever. As such, they'll need to assess how easily a product can be maintained for low costs and less time. This means that the NPDT should focus on designs where product parts can be easily accessed and replaced, removed and added without damaging the rest of the product, and easily acquired in the market at a reasonable cost.

As a general rule, DFM and DFS require the NPDT to be familiar with manufacturing procedures. Likewise, the NPDT should be aware of any obstacles in the field that could complicate product maintenance and repair.

No doubt, when it comes to DFM and DFS, members of the operations and technical services department should participate in the conceptualization, design, and product architecture stages.

Stage N°7. Detailed Design

By this point, the NPDT will have established technical specifications, conceptualized the product, and created an architectural model that takes into account the product's manufacturability. All of this leads up to the detailed design phase, which involves final product rendering and putting the finishing configurations on the product design. This stage is absolutely necessary for production planning.

Detailed design is also known as industrial design. Within academia, it is generally considered the field that's responsible for coming up with the aesthetic and ergonomic forms that become part of a user's experience. In certain contexts, a technical product's ergonomic form significantly affects a customer's decision to adopt the product (e.g. manned machinery, control panels, corporate furniture, user control systems, etc.). A product's artistic or non-functional design depends on different buyers' criteria. Some companies care about what their factories or plants look like; meanwhile, other companies are part of an industrial chain where the aesthetic presentation of the finished product is a core product attribute. Nonetheless, as far as form, aesthetics, and art are concerned, it's good to remember that a significant portion of technical products still have to meet basic requirements for spatial compatibility, signage, safety, as well as requirements that ease logistics and identification. Remember that the Bauhaus school, founded at the beginning of the twentieth century, introduced the idea that industrial design should be based on function.

All in all, the detailed design stage for technical products should be seen as a process of optimization. There could be size conflicts, or inadequate tolerance ranges, coupling issues, or issues that were overlooked during conceptualization, such as how elements are arranged (e.g. conductors, fasteners, air pockets, etc.)—all of these things need to be assessed and discussed on a multidisciplinary level. Detailed design is where a whole host of factors converge, all of which have design implications for a product's packaging, logistics, transport, storage, production, use, maintenance, and recycling.

The development of software such as 3D CAD (computer-aided design) has made the detailed design stage much more productive and efficient. Likewise, companies are able to create far more accurate lists of materials (a bill of materials, or BOM). See Fig. 6.20. Sometimes, having a more detailed BOM can significantly reduce the time and money it takes to acquire materials, ingredients, or components of the finished product.

Stage N°8. Prototyping, Tests, and Perfecting the Product

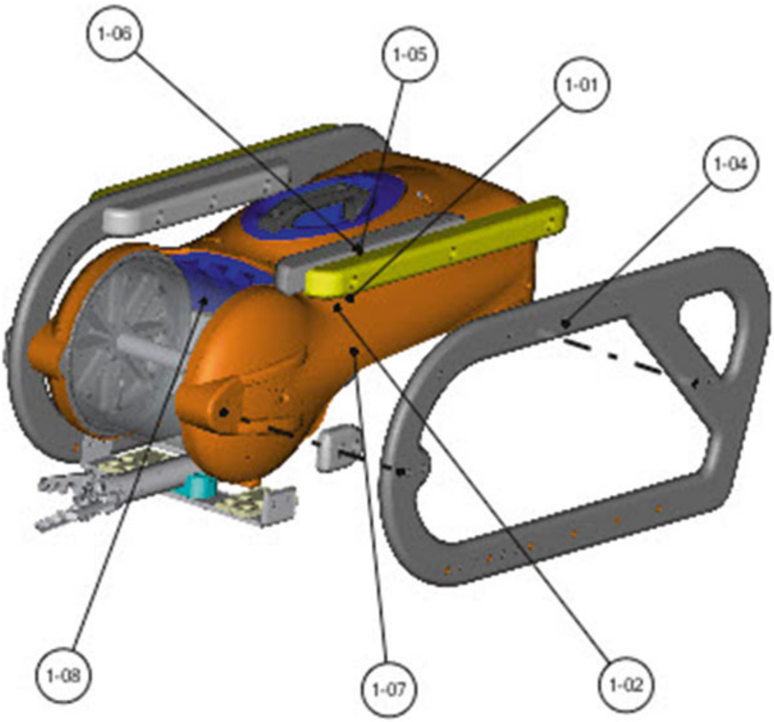
A prototype is a partial or approximate example of what a finished product will be like once it's produced on a mass scale. By using 3D CAD during the detailed design stage, a company has already taken the first step towards creating a visual prototype of the future product. However, with technical products, it's absolutely essential to create a physical prototype that can be submitted to functional tests.

It's true that software and mathematical modeling have progressed to the point where they're able to predict unexpected effects on products. Yet, a manufacturer should assume that there will *always* be situations in the real world that won't have been foreseen during simulations.

Sometimes, in making a prototype, a company can be less stringent about their procedures than they would otherwise be during mass production. Other times, prototypes can only be made using a plant's normal operations, thus giving the manufacturer an early taste of what manufacturing the product will be like.

Before building a prototype, a company should establish what its objectives are. This is known as 'hypothesis testing'. Building a prototype is expensive and

Spare Parts List



Description	BOM Id	Qty
Backpin1-1	1-01	1
bottom cover-1	1-02	1
Bumper Side, Plastic REVb-1	1-03	1
Bumper Side, Plastic REVb-1	1-04	1
Float-Plastic Frame-2	1-05	2
FLOAT4s-1	1-06	1
ML303-B1-MP1-1	1-07	1
ML304-B-MP1-2	1-08	1
View Port, Acrylic 150m-1	1-09	1

Fig. 6.20 Example of a detailed design created with 3D CAD. Alongside it is the materials list (bill of materials, or BOM). This representation shows which product parts are separate from one another and can be replaced over the course of the product's service life

time-consuming, yet, prototype testing can be an essential ingredient in ensuring the success of a project. For the most part, the greater the business risk associated with a product, the more sense it makes to plan, invest in, construct, and study prototypes. Furthermore, there are other, related benefits to building prototypes, such as reducing the amount of time spent on a development project and the number of work-hours for NPDT personnel.

What follows is a list of some of the most common reasons for studying technical product prototypes:

- To study a product's overall functioning and performance
- To study how a product functions or performs specific tasks
- To study how individual components function
- To study how components function and communicate with one another
- To analyze how the product reacts to various and/or harsh conditions
- To study how a user controls and handles the product

Additionally, a prototype lets others know how a project is advancing, including company higher-ups or possible investors. It can also be used to train new members of the NPDT.

The protocol for prototype planning has been well-documented. As such, the NPDT should have no excuses for not carrying it out and avoiding problems that are common to this stage. These kinds of problems include:

- Fixation on a specific design
- An obsession with perfecting aspects of the prototype that will not be included in the final product
- Improvising the experiments for prototype testing
- Improvising the budget for prototype testing

Figure 6.21 depicts the standard process for prototyping. Here, the emphasis is on experimental design.

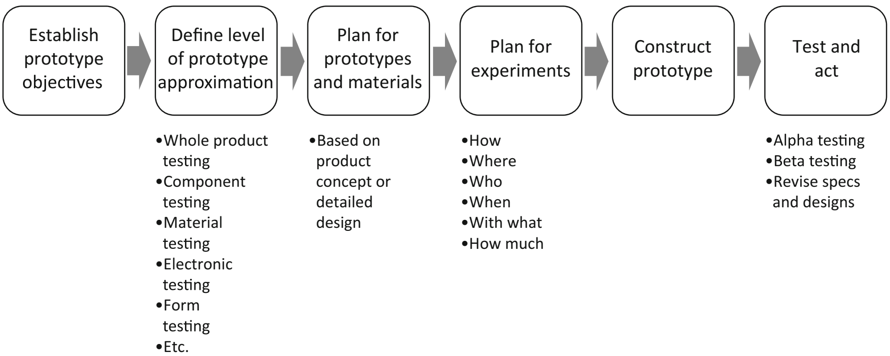


Fig. 6.21 Standard process for planning a product prototype

Generally, prototypes go through two experimental stages of increasing complexity. The Alpha Test is a type of experimental design that takes place in a controlled environment at the manufacturer/developer's own facilities. It's a good idea for a select group of customers (e.g. early-adopters) to participate in alpha testing—that way, a company can get independent feedback on factors that it considers important. The Beta Test (also known as an industrial test) takes place in a real operational environment, preferably at the facilities of one of the customers who participated in earlier stages of the development project.

Stage N°9. Production Planning and Scaling-Up

The last stage in product development involves planning for volume production and actual product manufacturing. The goal of this stage is to get the product design and prototype into volume production in the shortest amount of time (time-to-volume) and at the lowest cost possible, without impinging upon functionality, attributes, and the robustness that target application customers require.

Once again, the reader shouldn't think of this stage as one that simply follows on the heels of the previous stages. Rather, they should think of it as its own sub-project, one that should begin as soon as the product's design, composition, and architecture have been established. A company can use what it has learned from building and testing the prototype to plan volume production. When a company is unfamiliar with the required production methods, the NPDT can get help from outside the company. This, together with the novelty of the new product, makes production more complex and somewhat riskier. See Fig. 6.22.

Part of planning for volume production means that the NPDT (together with the company's operations department) will need to figure out the production requirements, including: necessary supplies, which areas of the plant will be designated to the new product, required equipment, methodology and supply agreements, production methodology, required personnel, supervision, training, applying for patents, and obtaining the necessary permits in order to commercialize the product.

They will also need to design the production control panel and system, and determine production times as well as recurring and non-recurring costs. These requirements and activities should be planned and scheduled ahead of time.

This sub-project involves the following:

– As soon as possible, the team should begin applying for patents and any other necessary permits for product commercialization
– Make any necessary changes to the plant facilities, install and set-up machinery
– Begin pilot production (also known as a 'trial production'), outline and document the production process so that it can be perfected later on.
– Measure costs and production times. This sets a standard that should be improved in future production.

It's interesting to note that planning for volume production goes hand in hand with the new product introduction program. Although the operations/logistics

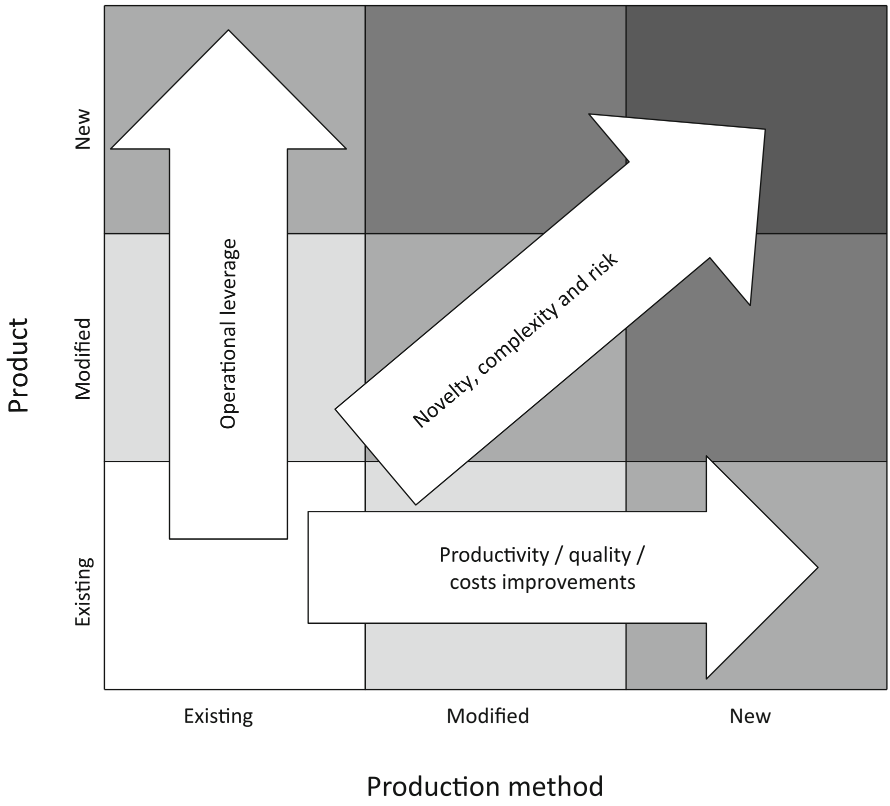


Fig. 6.22 When developing a new product, a company may need to develop new production methods; this makes a development project significantly more complex. When this happens, the operations manager should begin planning, designing, and developing new production processes while the product development project is still underway. A company's production method can be just as important and strategic as patenting the newly invented product. Adapted from: Steven C. Wheelwright and Kim B. Clarck. Creating Project plans to focus product development. HBR, 74. 1992

department is in charge of planning for volume production, they'll need help from the new product introduction team (NPIT). The NPIT can give them important information about potential market demand and the characteristics of the first customers that are likely to adopt the new product.

7 Organizing an Industrial Company's Marketing and Sales Department

Introduction

It's a little known fact that Napoleon's major victories were due, in large part, to the organizational structure he created for his armies. The *Corps d'Armeé* consisted of small, independent military formations, each of which contained all the elements of a full army: cavalry, artillery, and infantry. When facing off against a larger army, the *Corps d'Armee* were able to maneuver incredibly quickly. This came as a surprise to Coalition forces, who were known for their cumbersome and truly enormous armies. The Coalition moved slowly, it was difficult for them to maintain lines of communication, and provide their armies with food, water, and ammunition.

The *Corps d'Armeé* offered several advantages at once. Of these, one of the most significant was that different military formations were able to advance along different lines simultaneously. This gave them various food supply routes and it meant that they were able to advance further and more quickly.

On the whole, designing a good organizational structure is unfamiliar territory for most companies. Yet, it can potentially leave the greatest and swiftest impact on a company's performance and customers well-being without the company having to make significant investments. To that end, industrial company higher-ups need to make a habit of asking themselves:

– Does my marketing and sales department have a well-designed *organizational* structure?
– How will I know if it's well designed?
– What's the difference between a well-structured marketing and sales department and the current structure of my company's marketing and sales department?
– If a marketing and sales department has a good organizational structure, what impact does that have?

By contrast, when asked these questions, a significant percentage of company directors respond rather uncomfortably:

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_7

ORGANIZATION STRUCTURE ACCORDING TO BUSINESS CRITERIA	ORGANIZATION STRUCTURE ACCORDING TO COMPLEXITY	ORGANIZATION STRUCTURE ACCORDING TO EMPOWERMENT NEEDS	ORGANIZATION STRUCTURE ACCORDING TO BUSINESS CULTURE
Per function structure	Simple structure	Centralized structure	Hierarchical structure
Per product structure (divisional)	Flat structure	Decentralized structure	Organic structure
Per market structure	Matrix structure		
Per geography structure	Network structure		
Per process structure			

Fig. 7.1 Once a company has established its business strategy, it can use the above four criteria to define its organizational structure. When they're used together, these four criteria help a company determine various aspects of its organizational design. *Source*: Designing your Organization: Using the Star Model to Solve Critical Design Challenges. Any Kates y Jay Galbraith, 2007. The Balanced Score Card Roberto S. Kaplan y David P. Norton, 1996

> We adapt our human resources to suit the circumstances. We want to remain flexible in this area.

And so, for the vast majority of industrial companies, the organizational structure of their marketing and sales department is largely based off of intuition. A matter of trial and error. As a result, the majority of companies continue to make the same mistakes over and over again. Senior management rely on their company's excellent products and services, their competitive offers, the leadership and talent of their managers, only to find themselves unable to explain why their company has lost sales over time. No doubt, there is a variety of complex reasons that might explain it. There may even be more than one. Yet, when companies start going through the standard checklist, trying to get to the root of a problem, they tend to overlook one thing: the organizational structure of their marketing and sales department.

In this book, 'organizational design' refers to a formal process for structuring and systematizing an organization of people—this includes the organization's processes, procedures, tasks and responsibilities, coordination, supervision, information systems, resources and remuneration systems. As the reader can imagine, organizational structure and design is a vast topic. What's more, it's the focus of several books, courses, and seminars, all which attempt to describe how to organize various types of companies within a range of different sectors. Almost always, the consensus is that the organizational structure of a company is defined by the company's business strategy.

There are different criteria that a company can use to define its organizational structure. Some of these criteria are listed in Fig. 7.1.

Yet, these types of organizational structures apply to a company's overall structure. The organizational structure of a company's *marketing and sales department*, however, has its own set of characteristics and criteria.

This chapter is entirely devoted to discussing the organizational structure of an industrial company's marketing and sales department. The purpose of this discussion is to analyze possible organizational structures, the professional profiles required of marketing and sales personnel, their roles and responsibilities, and, finally, how these factors are coordinated. Given the importance of how the marketing and sales department is structured, this chapter is meant for discussions amongst upper management.

The Driving Force Behind a Sales Department's Organizational Structure: Specialization

As discussed here, there should be a dedicated marketing and sales department for each business unit. Their organizational design is built on a very particular market paradigm: that industrial customers' needs are becoming increasingly specialized. According to this paradigm, the products and services that industrial customers need are becoming increasingly complex, sophisticated, and their design and composition are progressively more multi-scientific. The factors that determine the organizational structure of a marketing and sales department are meant to provide better service to target customers.

In this book, marketing and sales department organization is discussed separately from corporate organizational structure (which will already have been designed and implemented).

The specialization of customer needs is an inescapable market force. As such, it's something that companies have to take it into account, regardless of their corporate organizational structure (e.g. functional, divisional, flat, matrix, centralized structures, etc.). Figure 7.2 shows the general process for designing the organizational structure of an industrial marketing and sales department. This process is based around the idea of market specialization.

A Company's Strategy Statement: An Outline of Where the Company Is Headed

Entire volumes could be written about different companies' strategy statements. In fact, such volumes have been written. Strategy statements cover a wide range of points:

(a) 'Where': this refers to businesses, markets, segments, geographic locations, etc.
(b) 'How': this refers to products, services, distribution channels, Porter's dualism (differentiation vs. low cost), prices, competition, focus, corporate synergy, timing, etc.
(c) 'How much': this refers to market penetration goals, sales, market shares, production volume, etc.
(d) 'Why': this refers to unfulfilled applications needs, market size, speed of market penetration, previous experience, market stability, diversification, etc.

This chapter won't spend time discussing the legitimacy of a company's reasons for choosing one strategy over another; rather, it will assume that these things have already been established and clearly stated. As discussed previously, a company

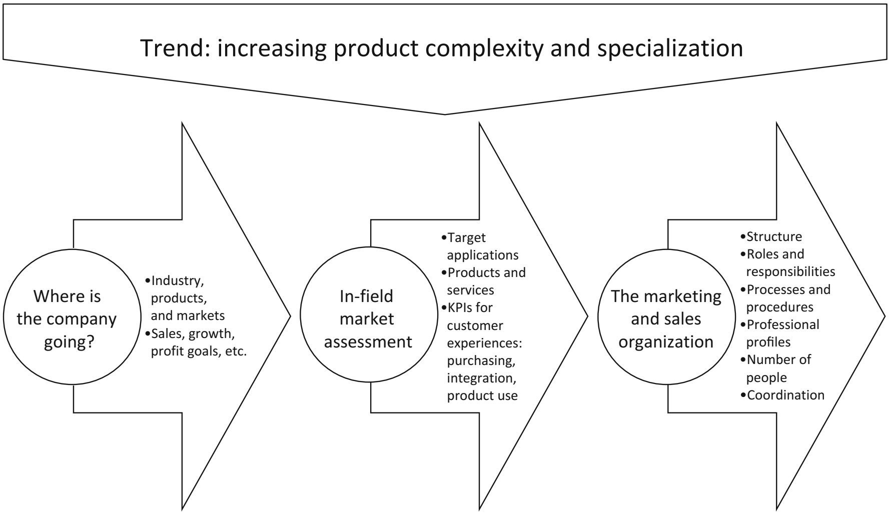


Fig. 7.2 In order to arrive at a well-designed organizational structure for their marketing and sales department, a company needs to begin by establishing its strategic intentions. This includes: what kind of business they are, the products and markets they'll be involved in, and, in each case, the degree to which they'll be involved. The basic premise behind a marketing and sales department's organizational structure is that industrial customer needs are becoming increasingly complex and specialized. The strategic definitions are derived from the company's field visits. Field visits provide more accurate and/or creative information, which allows a company to determine its target markets, product design, channel design, and the offer performance metrics required by customers. Later on, this information serves as a foundation for designing the marketing and sales department's organizational structure

won't know what kind of resources or organizational structure it needs without having made these decisions. It's a logical sequence of events.

On the other hand, there are a lot of companies with an established organizational structure that are just starting to ask themselves these strategic questions. In that case, a company should go ahead and identify the above information and subsequently assess the current organizational structure of their marketing and sales department.

Gathering Information from the Field (E.g. Discovery Team©)

This volume has consistently stressed the importance of understanding one's business from a field-based perspective. There are certain important details that a company can *only* find out through fieldwork and that are fundamental to a good business design. Yet, 'fieldwork' encompasses such a wide variety of definitions—taken alone, it can be impractical and not much help to companies that are looking to gather information about their markets and customers. So, as a guide, this discussion will refer back to concepts and tools described in previous chapters and that industrial marketers may already be familiar with:

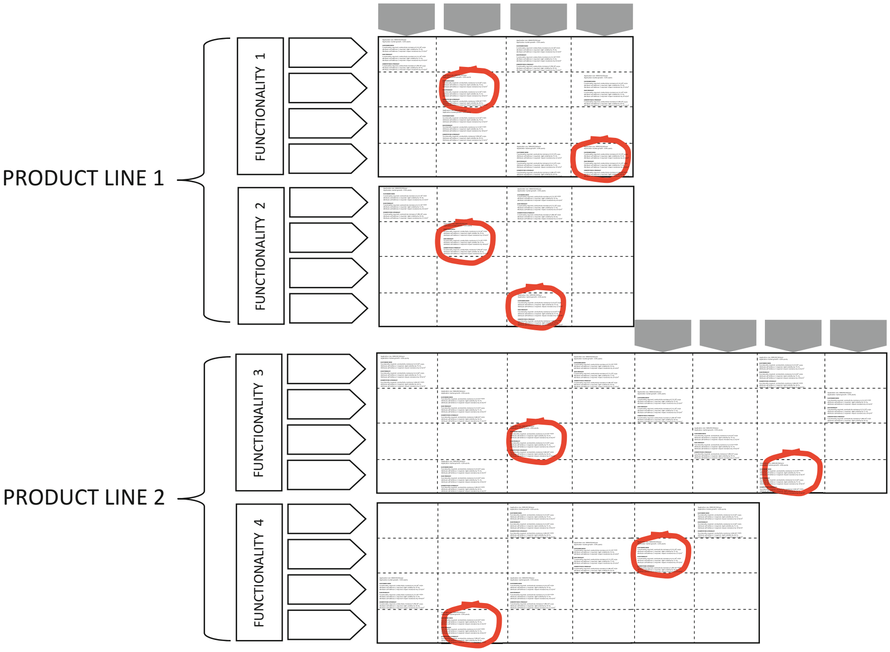


Fig. 7.3 The product-application matrix shown above includes two different product lines (1 and 2). Each cell contains information on a different application (e.g. information such as application size, economic benefits to the customer metric, etc.). Cells with a *circle* around them indicate applications that a company is interested in and is going to target. For more information, the reader should refer to Chap. 5 which deals with industrial market segmentation

– Which, and how many, market applications (niches) a company will be offering its product to. To that end, an industrial marketer needs to have identified and characterized as many applications as possible, determined how attractive each one is, and targeted the applications that are in the customer's and the company's best interest. See Fig. 7.3.
– Each application should be described in detail. By now, the reader will have realized just how important it is for a company to identify which applications it's going to target. This should include information such as: application characteristics, application size, economic benefits to the customer, the number of customers in the target application, geographic areas the company is interested in, etc.
– Which products to sell and in what amount. Each market application requires its own specially designed products and services. A company should determine whether multiple products have been developed for the same market application. At this stage, companies should have a description of their product's technical performance and of how their product compares to other competing, or substitute, products.
– The structure of the industrial chain between the manufacturer and the end-user (this includes intermediaries, specifiers, how fragmented the chain is, etc.). Every product has to travel a specific 'route' in order to arrive at its target market application. There might be various intermediaries between an end-user and the manufacturer. This is shown in Fig. 7.4.

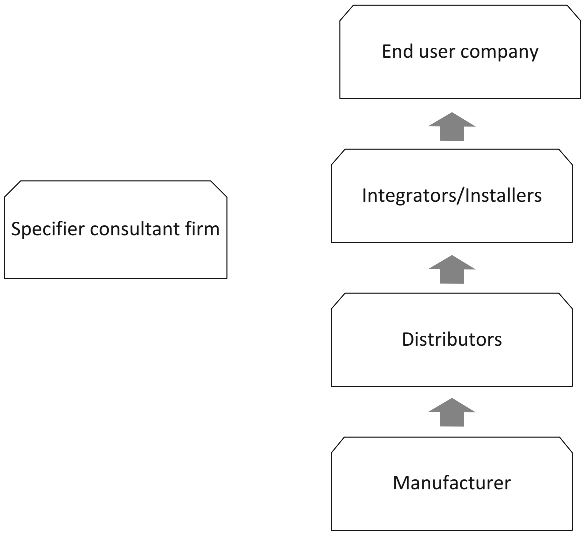


Fig. 7.4 Analysis and description of the industrial chain structure between a manufacturer and the target application. The chain may require distributors (see Chap. 9), installers, integrators, assemblers, etc. Parallel to this, there may also be external companies that determine a product's technical specifications. All of this is important information that helps a company design the right organizational structure for its marketing and sales department

– An industrial marketer needs to determine whether each market application requires its own, separate downstream industrial chain or, alternatively, whether a single downstream chain can serve various market applications. Here, it's important to determine how many intermediaries will participate in each industrial chain (e.g. the total number of distributors, installers, integrators, etc.) and where, geographically, these intermediaries are located. As discussed in Chap. 8, which deals with managing industrial sales forces, a lot of market applications rely on third-party product specifiers (e.g. engineering firms). These specifiers decide which products are needed for a capital expenditure (Capex) project and where to source them from. Specifier firms are used to having in-depth discussions with technical, marketing, and sales personnel at different supply companies. That way, they remain up-to-date on the latest technology, its benefits, and costs.
– Metrics for measuring customer satisfaction during product use. A good market research methodology takes users' needs and translates them into technical specifications. As shown in Fig. 7.5 (and discussed in Chap. 2), these needs have to do with a product or service's functionality and various types of attributes. Additionally, a company will need to design, determine, and measure the degree of after-sales services they'll be offering to customers throughout the product's service life.

For instance, for its repair and maintenance services, a company may need to provide replacement parts in areas that are geographically close to the end-user. Not only will this affect the way a company designs its distribution channel, but it also determines how a company structures its logistics organization.

– Metrics for measuring customer satisfaction with product distribution, integration, and assembly. Once a company has determined the ideal channel structure for each market application, it should identify what kind of needs distributors,

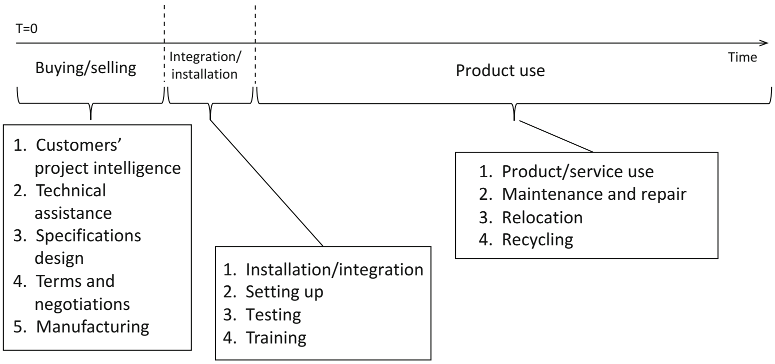


Fig. 7.5 A customer has three major experiences with a supplier: purchasing/selling, integration/distribution, and product use. Shown here are some examples of different variables that are important to customers in the downstream industrial chain. Suppliers need to realize that customers will be assessing the performance of these variables. It's very important that the supplier company identify what these variables are and create a performance metric for each one. Doing so will help them figure out roles and responsibilities within the organizational structure of their marketing and sales department

manufacturers-integrators, or installers have. Likewise, the company should now determine a performance metric for each of these needs. Again, this information will help a company figure out the right organizational structure for its marketing and sales department, one that also serves intermediaries. Additionally, it helps a company design an appropriate logistics system.

– Metrics for measuring customer satisfaction with the purchasing experience. The purchasing/selling experience generally includes promotional activities, technical consultations, drawing up proposals and price lists, product testing, writing contracts, dispatch and delivery planning, etc. It's important to know how much resources this requires—not only does this determine how a company structures its sales and logistics departments, but it also affects how the Proposal Department is structured. Sometimes, the supply company can use this information to determine its work capacity in other departments, such as credit and collections. The metrics should include appropriate deadlines for each of the above tasks (e.g. technical consultations, turning in proposals, etc.). Companies should cross-reference information such as the appropriate number of visits with the total number of contacts (e.g. meetings with customers). This will help the company determine how much installed capacity and resources this stage requires.

Using these three performance metrics as a guide (which apply to product use, distribution/integration, purchasing), those in charge of organizational design should consider how much their company will be interacting with the customer over time, and who will be involved in those interactions. Figure 7.6 gives the reader a general

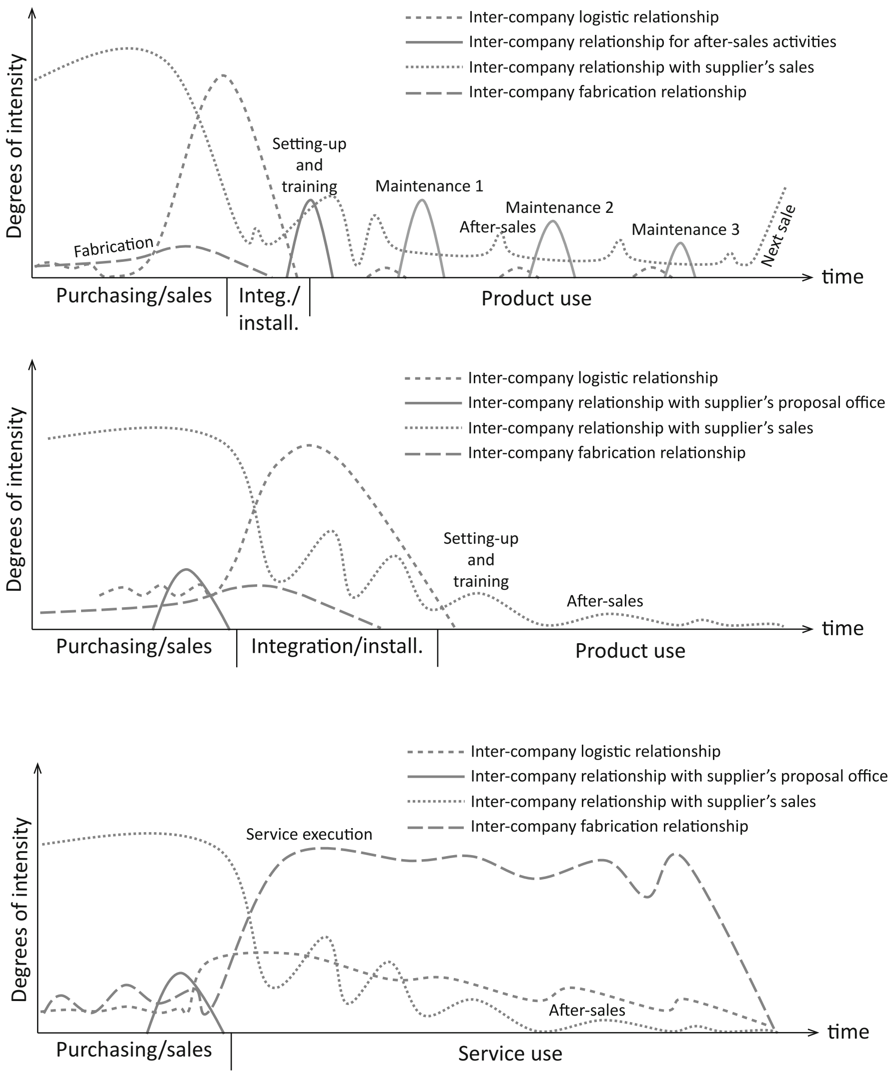


Fig. 7.6 *Above*. Relationship between an industrial supplier's personnel and a customer's personnel over the course of the sale, integration/distribution, and product use stage. This graph applies to a mass-produced product that requires maintenance services. *Center*. This graph applies to made-to-order products. *Below*. This graph applies to service contracts. These three graphs give the reader a general sense of the intensity of the relationship between a supplier's and a customer's personnel (this example doesn't specify which customer personnel). Here, the intensity of the relationship refers to the amount of communication, in-person meetings, requests, procedures, documentation and professional agreements that take place. These dynamic relationships should be formalized as a service design, one that includes information such as: the personnel positions from each company who will be interacting with one another, each parties' expected timetable, the flow of internal and inter-company communication, responsibilities, the deliverables, as well as the metrics for each of these. The service design should eventually include Discovery Team activities (market research lead by the marketing department), collections/treasury activities, or the intensity of the supplier-customer relationship during product development

idea of what the relationship is like between a customer and a supplier's marketing, sales, logistics, and operations (that is, production and services) personnel. The three diagrams, A, B, and C, show the nature of this relationship and its level of intensity in three different business contexts: a standard offering that requires maintenance services, a made-to-order product, and service (or Opex) contracts.

The above graphs apply to the purchasing, distribution/integration, and product/service use stages. There are several observable phenomena highlighted in this graph that an organizational designer should be aware of:

– The supplier-customer relationship is multidisciplinary
– Each area of the company has active periods in which it interacts with the customer
– Each area of the company provides certain deliverables which are measured and controlled by performance metrics.
– Employees at each company must systematically communicate with one another. This communication should follow a protocol.
– There are certain tools or information systems that can help facilitate a methodical supplier-customer relationship.

The methods and concepts described in this chapter are meant to help a company design the organizational structure of its marketing and sales department.

Designing the Organizational Structure for an Industrial Marketing and Sales Department

Combining the information from the business unit strategy statement with information gathered from the field (see above) gives a company ample material to work with. From there, an industrial company can begin to structure, organize, and outline the dimensions of its marketing and sales department.

This information should include: each product's expected sales and production volume, product applications, the geographic location of these applications, the number of customers at each step along the industrial chain (whether intermediaries or end-users). Also, a company should be fully aware of all the tasks and activities they'll need to perform in order for the supplier-customer experience to go smoothly. At the most basic level, all companies need to design an organizational structure for their marketing and sales department; on occasion, this also includes a Proposal Department. See Fig. 7.7.

Less developed industrial companies tend to have a single, yet relatively functional sales department. In order to design and structure the rest of marketing and sales activities (after-sales, marketing, proposals and services), a company should start by measuring customer needs and learning about their customers (customer characteristics). Again, this information is derived from the three types of experiences customers have with suppliers: purchasing, integration, and product use.

Before going into detail on the organizational structure of a company's sales force, it's important to define certain concepts and technical-sales positions that

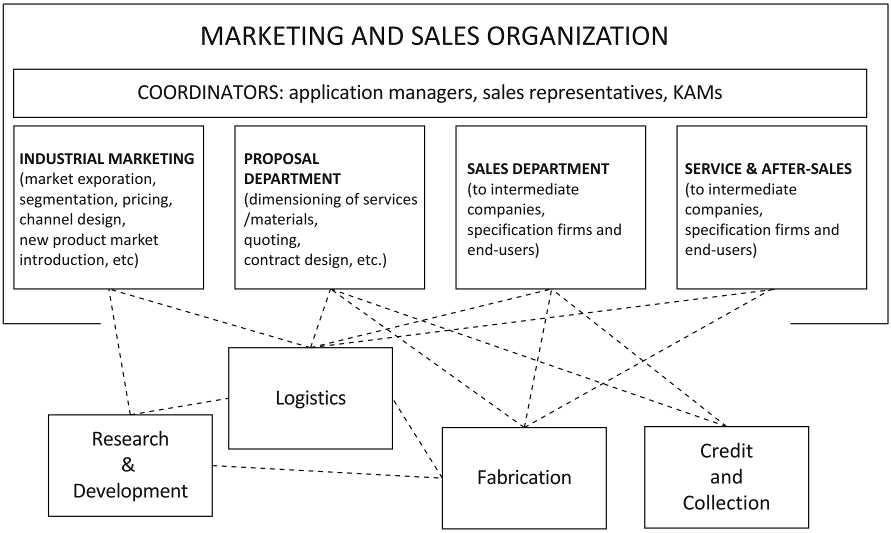


Fig. 7.7 This diagram shows the basic relationships between the functional areas of an industrial marketing and sales department and other company departments. These areas should be coordinated by multidisciplinary executives who are able to fill a variety of roles, such as Product Managers, Application Managers, or Functionality Managers (see below). Sometimes, if a company has a lot of after-sales commitments, they may want to create a separate service unit for after-sales support. *Note*: companies that provide made-to-order products and services tend to have Proposal Departments

functionally connect a company to the marketplace. There are five commercial positions proposed here: Sales Engineer (also known as a sales consultant), Sales Representative (or salesperson), Product Manager, Application Manager, and Functionality Manager. The Product Manager isn't formally a member of the sales force; rather, he/she is a skilled industrial marketing executive. To give the reader an idea of how organizationally complex certain cases can be, companies should only consider having a Product Manager when absolutely necessary. Other sales positions, such as sales analyst or sales assistant, will be described below.

Cross-Selling Technical Products

In an industrial context, cross-selling is when a supplier promotes more than one product to a customer company. This is diagrammed in Fig. 7.8. If the products or services are fairly complex (and require technical consultations in order to be specified), then a company needs to demostrate to its customers that there's a functional, logistical, administrative or economic advantage to adopting more than one of its products.

This book doesn't deal with how to design a cross-selling program for industrial products. However, industrial marketers are encouraged to spend time reviewing the benefits and risks of cross-selling. Above all, he/she should assess whether there's a

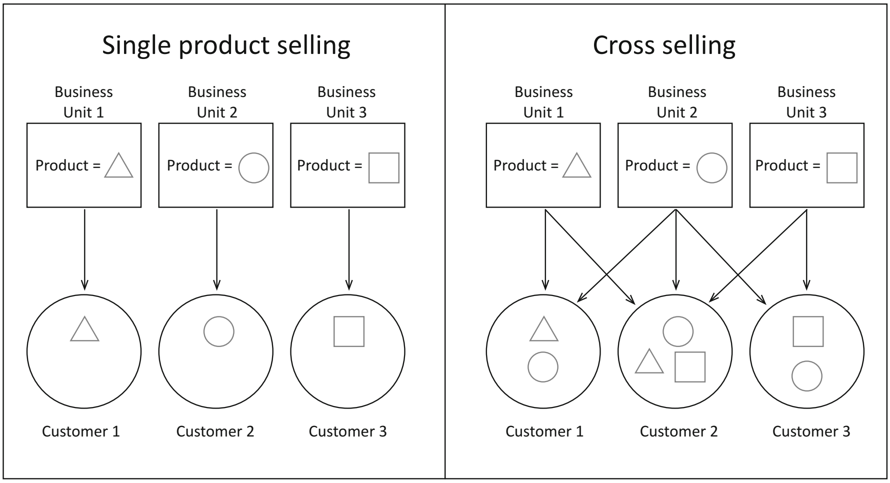


Fig. 7.8 Two different cases showing the need for cross-selling in different market applications. On the *left side*, either because the company has very few products on offer, or because it doesn't need to do cross-selling, there's less coordination. Here, each Sales Engineer works exclusively with his/her own customer portfolio. For the company on the *right side*, however, cross-selling is necessary. This requires more coordination between specialized sales forces

weak link in a joint offer; that is, if there's any product/s or service/s whose performance or robustness might damage the reputations of other company products or business units.

Cross-selling makes things more complex for suppliers with diverse product offerings; it means that there needs to be more coordination between business units or product lines in order for these products to be sold to a single customer. For instance, some companies are structured divisionally. This can lead to the creation of business 'silos' where each 'silo' commercializes its product independently. Quite often, when divisions are incentivized to work alone, managers at different business units end up competing against each other. In these cases, each Division Manager tries to show to the corporates that their business unit has better top or bottom-line performance.

Only once a company overcomes this divide between incentives and cooperation in its various business units, it can start designing a sales plan for its cross-selling program.

Sales Managers often say that the reason they don't do more cross-selling is that they don't want to bother their customers by sending out more specialized salespeople to 'knock on their doors'. This is because cross-selling has a window of time in which it can be successful. Naturally, if a customer is unable to work without being disturbed by a constant stream of salespeople, then cross-selling doesn't make sense. Oftentimes, in their attempt to solve this hypothetical problem, commercial or sales managers try to promote cross-selling by providing their inter-divisional sales force with more incentives and a more diverse product portfolio. This can be disastrous if a customer requires greater and more specialized technical consulting.

This volume attempts to address the fact that technical products are becoming increasingly complex and specialized. Theoretically, one way to deal with this problem is to have greater coordination between *specialists*. Thus, ideally, sales directors should organize a group of product specialists to visit a customer's facilities. This allows the company to provide deeper technical consultations and product specifications that ultimately benefit both parties: supplier and customer.

The Sales Engineer

A Sales Engineer (also known as a sales consultant) is a specialized professional who deals with specifier firms and end-user companies. His/her job is to manage technical sales, provide technical consulting, and discuss the benefits and limitations of different products or product lines. In other words, they're both a Sales Representative and an engineering consultant. As opposed to the professional traits described by Mack Hanan in his legendary book, *Consultative Selling*,[1] a Sales Engineer is a technical specialist and is not necessarily a financial executive. Their knowledge of the product means that they're constantly studying the product's technology, its functionality and attribute performance, and any other aspects that ensure proper product integration and a reliable service life. Additionally, the Sales Engineer should be familiar with the product's market applications and the technology behind those applications.

If a product's technical requirements are specified by third party companies, then the Sales Engineer needs to spend time consulting, educating, and promoting their product to these companies.

Up until now, this discussion has focused on how to design a sales force geared towards end-users. Having intermediaries between a supplier (in this case, a manufacturer) and its end-users affects the structural organization of the sales department. The organization of the sales department should reflect the structure of the downstream industrial chain. A Sales Engineer who meets with an end-user and a specifier firm won't have the same professional profile as a Sales Representative who meets with distributors. In fact, as shown in Fig. 7.9, these two positions should be clearly distinct from one another.

The reason companies should divide their sales forces is two is that both, end-user's needs and design specifications needs are very different from the needs of intermediaries (be these distributors or installation contractors).

Of course, when there are intermediaries, a supplier doesn't have to organize logistics, invoices, credit, or payment with end-users. The end-user is more interested in a product's functionality and attribute performance, and in how robust the product is throughout its service life. Even if it's implied, this is just as true for ingredient or component products that are integrated into a finished product. Intermediaries, such as distributors, contractors or, on occasion, integrators (e.g. construction companies), are more interested in negotiating the price of a product, credit, payment methods, delivery logistics, stocks, the return policy, etc.

[1] Consultative Selling. Mack Hanan. American Management Association. 6th Edition. 1999.

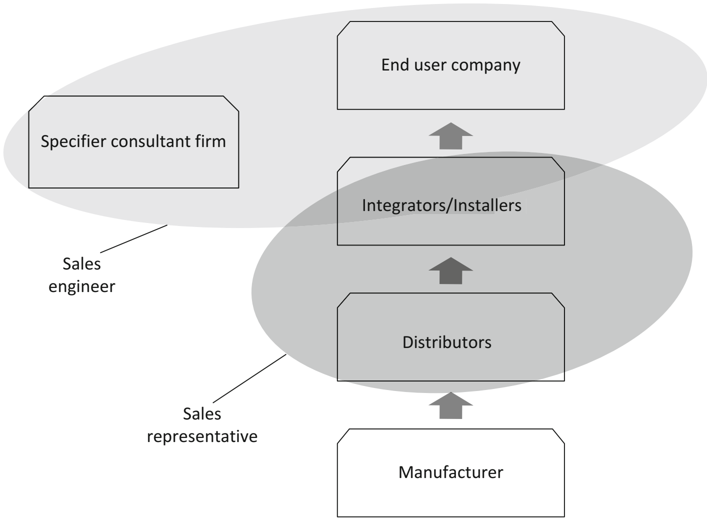


Fig. 7.9 Whenever a manufacturer's products have to go through intermediaries before arriving at the end-user, the manufacturer should divide their sales force in two: one sales force to promote their products to end-users and specifiers (Sales Engineers), and the other to promote their products and manage information within the industrial chain (Sales Representatives)

The Technical Sales Representative

A Technical Sales Representative (also known as a Technical Salesperson) is a mid-level professional who iterates with different customers in the industrial chain, including: distributors, installers, integrators, etc. On the whole, a Technical Sales Representative's job is to discuss logistics and product characteristics with intermediaries and to negotiate prices.

Sometimes, when situations don't require a great deal of technical consultation, the technical salesperson can assist in finding new sales opportunities. They can contact end-users and pass along any sales leads to a product/technology specialist, such as the Sales Engineer.

The Application Manager

The Application Manager's responsibility is to permanently understand each application's technical and commercial requirements, the technologies involved in them, as well as any trends, cultural factors or terminology that relate to the application. An application manager can be considered as a Sales Engineer specialized in one relevant market application. As such, their work is primarily field-based.

The Application Manager coordinates more specialized product engineers (when cross-selling requieres it), resident engineers (if applicable), Discovery Team programs, new product introduction programs, customer trainings, and after-sales programs (repair, maintenance, etc). A company should assign an Application Manager if it is interested in the strategic value, size, or growth of an application (market segment). A company might be attracted to an application because it allows the company to gain leadership or improve its competitive position through certain products. Or, no less important, an application might be attractive because it allows a company to increase its technical knowledge.

The Product Manager

The Product Manager is sometimes described as a 'mini-CEO'. Their job is to articulate, coordinate, and, on occasion, manage other tasks that are related to a given product or product line. In other words, the Product Manager is in charge of designing a product's business plan, including: the relationship with suppliers, R&D, finances, production, logistics, and supply chain management (including distributors, integrators, installers). He/she should understand who the end-user is, and be knowledgeable about certain market variables such as product life cycle, the demand forecast, pricing, and product promotion. As such, the Product Manager is the managerial hub who connects marketing and sales, customers, suppliers, and his/her own business organization.

Given the above, an industrial company should consider hiring a Product Manager if they have multiple product lines that are administratively complex (e.g. if new versions of a product are developed through R + D) and/or if their product lines are highly strategically important.

For instance, it's natural for a large company that makes several products for several different markets to feel pressure from smaller companies that have been able to specialize in a particular product-application. In this case, the large company can hire Product Managers to defend the market position of the company's products or product lines. Sadly, however, this is one the most misunderstood of all company jobs. The Product Manager at one company may have very different responsibilities from the Product Manager at another. Even within the same corporation, Product Managers in different divisions may manage things very differently. In this chapter, the Product Manager is seen as an Industrial Marketing Manager specialized in a product line.

The Functionality Manager

A Functionality Manager is an expert on the technology (or science!) behind a product's functionality. He/she is key member of the R&D staff, and when required, they help understanding customer needs. They also support the sales force (sales engineers, application managers, etc.) when a customer situation is technically demanding. For example, the functionality of a coating paint that's used on structural steel for bridges (that is, on steel beams) is to 'prevent corrosion'. In this case, corrosion is a very specific and complex science to deal with, and the solution may require a new development or at least be assessed by a Functionality Manager.

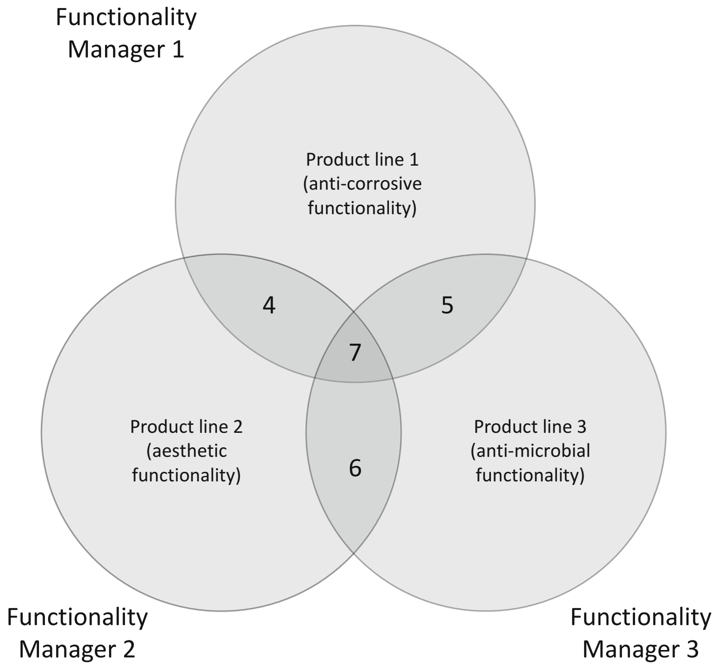


Fig. 7.10 Functionalities provided by industrial paints. This diverse and extensive group of products, all of which are designed for different market applications, can be classified according to functionality. In this case, all of the products can be classified under three functionalities. Thus, it makes sense to hire Functionality Managers

Companies should consider hiring a Functionality Manager if the following two conditions are met:

1. The company should have a large number of products that are designed for a large number of applications.
2. All of these products can be classified under one or a few functionalities. For example, each product line might have its own distinctive functionality. Or, it might combine two or three different functionalities.

Coatings manufacturers (paints, flooring, etc.) are a good example of this. This is an industry in which companies have catalogs that include hundreds, or even thousands, of different products. Likewise, these products have hundreds of market applications. Yet, interestingly enough, these products can all be classified under a few functionalities or a combination of them. This is shown in Fig. 7.10.

By now, the reader will have realized that the Functionality Manager's work is R&D based and field based. For instance, take the case of industrial paints with an antimicrobial functionality (which are used in food processing factories, laboratories, hospitals, etc.). Here, someone with expert knowledge on the technology (a biochemist, chemist, microbiologist, etc.) needs to be able to understand customers' microbial problems in different industries and for different applications, discuss the problem with technical professionals at his/her own organization, and advice the sales force or even customers with complex technical issues.

The Organizational Structure of an Industrial Sales Force

The following is a list of factors that affect the structural organization of the sales force and the professional profiles required of its members:

– The vertical complexity of the supply chain (e.g. whether it includes distributors, integrators, installers, etc.)
– The zone of influence, which is determined by the geographic location of target applications
– The number of products offered to customers
– Degree of product specialization for specific applications
– The technical and administrative complexity of a company's products
– The number of customers who will receive consultations, reports, product/service promotions, and after-sales services from the company
– The number of applications a company's products may be used for
– The sales potential (either in value or in units) of target applications
– The technical and administrative complexity of target applications
– Cross-selling potential

These variables (all of which are important!) make designing the organizational structure of a sales force much more complex. In order to simplify this process, the first step is to consider that in industrial markets, product-applications are becoming increasingly specialized and products are growing evermore technically complex. As such, the sales force needs to have a high level of technical knowledge, especially those that deal directly with users and specifiers. Even Sales Representatives (see above) should have sufficient technical knowledge about a product, its technology and applications. The kind of sales force discussed here isn't centered around merely building relationships. As discussed throughout this book, solely relying on a relationship-oriented sales force to promote complex products jeopardizes the benefits that a customer receives from a product. Not to mention, a company puts its own reputation at risk.

Having established that the sales force should be made up of engineers and technical professionals with expert knowledge of a product (its functionalities, attributes, service life, metrics, technology, etc.), the next step is to figure out how many applications will benefit from the company's technology. This is why, with great care and dedication, a company needs to establish its target applications during the industrial market segmentation phase (see Chap. 5). Without this kind of strategic planning, a company's attempts to create a structured, well-coordinated and effective sales force are bound to be intuitive and disorganized. Not to mention, flawed.

Once a company has decided which applications to target and which products to offer, then the next most important factors shaping the organizational structure of a sales force are the company's growth plan and the number of customers in their target applications. Below, market characteristics and growth plans are discussed in order of increasing complexity.

Case 1. Limited Number of Customers, a Small Number of Products, and One or Two Market Applications

As shown in the three-dimensional graph in Fig. 7.11, small or recently formed industrial companies offer a small number of products for a small number of applications. These companies choose to work with customers within a limited geographic area: this could be a small country, a state within a larger country, a particular zone within a medium-sized country (north, east, west, or south), etc.

In these kinds of situations, there's a clear and established organizational structure for a sales department:

– Sales Engineers that specialize in a particular application

This scenario is more complex if a company sells its products through intermediaries. In that case, the sales force can include personnel who deal exclusively with the distribution channel. That frees up the Sales Engineer from having to deal with the logistics and administrative tasks of distribution channel management (see Fig. 7.9).

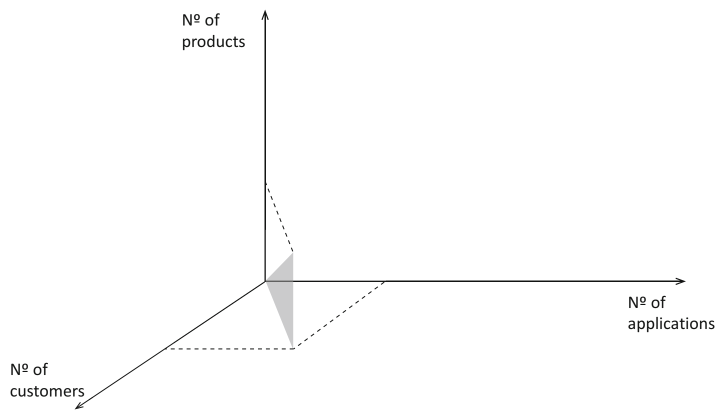


Fig. 7.11 This graph includes three variables: number of products on offer, number of target applications, and number of customers. This graph is representative of the majority of small or recently formed industrial companies during their early stages: they offer a small number of products for a small number of applications. There are five main growth opportunities for these companies (see the five cases discussed in the text below). Depending on which one they choose, this will affect the way they structure their future sales department

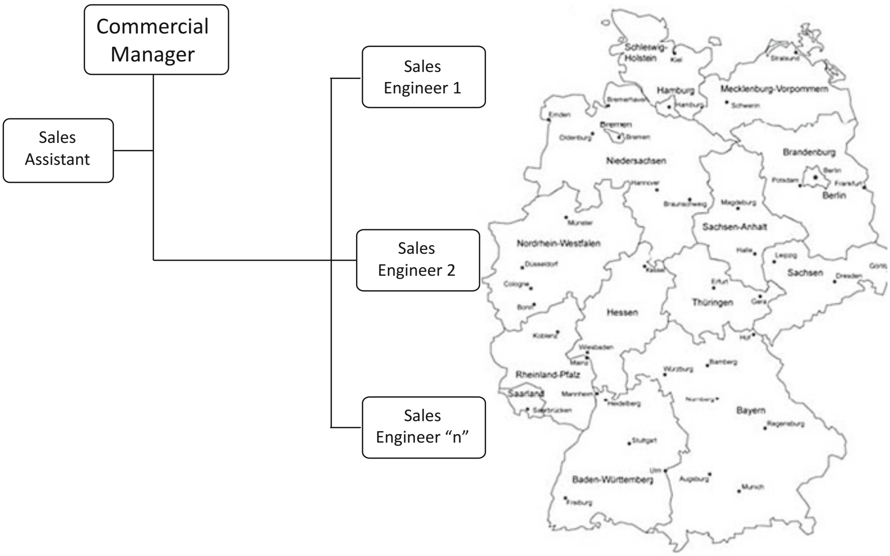


Fig. 7.12 Example of an organizational chart for a sales force in the case of an industrial company with a limited number of customers, and a small number of products that are meant for one or two market applications

Figure 7.12 provides an example of an organizational chart for a regionally-based sales force. For the sake of simplicity, industrial marketing personnel are not included in this graph.

In order to choose a growth strategy, a company should refer back to its segmentation program (which was based on product application). Likewise, companies should consider their own strengths and the advantages, disadvantages, and opportunities of each of the cases described below.

Case 2. Organic Growth Strategy: A Small Number of Products, One or Two Target Applications, and a Growing Number of Customers

Some companies make a conscious decision to specialize their technical product for one or two target applications and then promote the product to possible customers. This is shown in Fig. 7.13. Quite often, in order to reach more customers and have an attractive market size, these companies have to promote their products internationally (e.g. this is the case for the German *Mittelstand* companies).[2]

In this case, a company should increase its sales force personnel and assign each Sales Engineer to a specific group of customers. This is important for making sure that each customer receives the time and dedication they deserve. Given that

[2] Hidden Champions of the 21st Century. Hermann Simon. Springer, 2009.

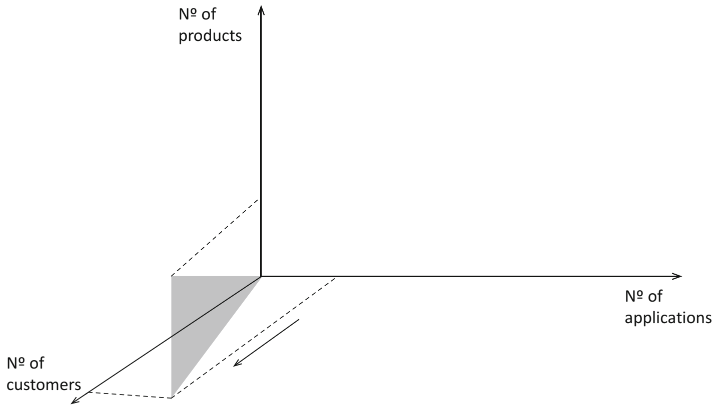


Fig. 7.13 Some industrial companies choose to grow by reaching out to new customers in one or two target market applications. Hence, their technical products retain a high level of specialization

product specialization tends to go hand in hand with product or service complexity, these Sales Engineers need to be technically knowledgeable, analytical, and they should have good inter-personal relationship skills. This structure requires relatively little coordination. The proposed organizational structure is:

– Each Sales Engineer (or product specialist) is assigned to a group of customers or a geographic region

Sometimes, customers may require more of a supplier's time and administration. In that case, a supplier can decide whether or not to assign a KAM (key account manager), thus freeing up Sales Engineers who might otherwise get overwhelmed by a few customers.

Figure 7.14 provides an example of a sales organizational chart for this particular growth strategy. For the sake of simplicity, industrial marketing personnel are not included in this graph.

Just as in case 1, this complexity increases if a company sells its products through intermediaries. Once again, the sales force can include personnel who are exclusively dedicated to managing the industrial channel. This frees up the Sales Engineer from having to deal with the logistics and administrative tasks of channel management (see Fig. 7.9).

Case 3. A Growing Number of Products for a Fixed Number of Customers, and a Small Number of Market Applications

For some industrial companies, their markets consist of highly concentrated customers exhibiting a high demand for related technologies, products, or services. In these kinds of situations, a supplier ends up providing an increasing number of

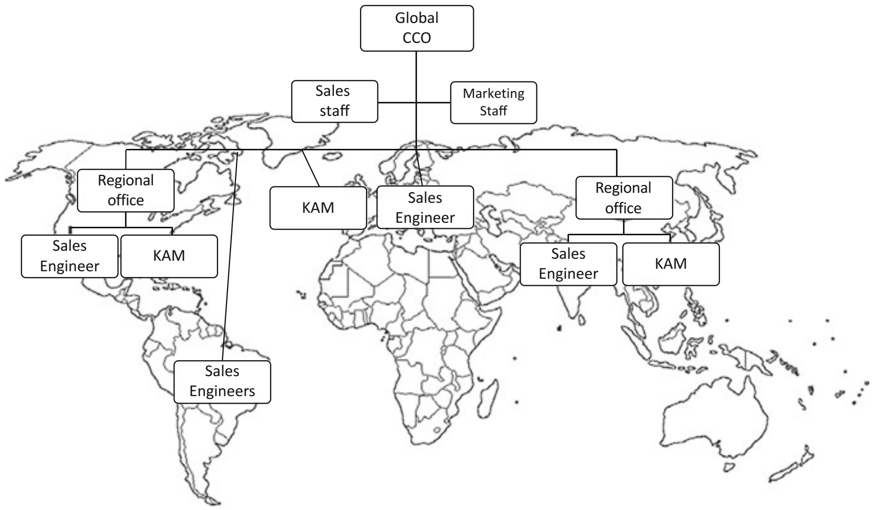


Fig. 7.14 Example of a sales organizational chart. This applies to industrial companies that opt for an organic growth strategy in which they have a small number of products, one or two target applications, and a growing number of customers. The global scale of this chart is only meant to serve as an example

products to a limited number of customers in one or two market applications. This is shown in Fig. 7.15. Sometimes, these products provide better functional performance when they're integrated together. For example, some companies that provide tax and financial auditing services, or wholesale banking, exclusively offer their services to customers in very specific industrial sectors.

These kinds of situations may require a considerable amount of cross-selling. As such, this volume recommends using the following organizational structure for sales:

– Sales Engineers (or product specialists) coordinated by Sales Representatives or KAMs (key account managers)

Figure 7.16 provides an example of a sales organizational chart for this particular growth strategy. For the sake of simplicity, industrial marketing personnel are not included in this graph.

Assuming that companies start off in a position similar to Case 1, they'll logically want to hire more sales personnel as customers begin buying more and more of their products. In the organizational structure proposed above, a company can increase its sales personnel without jeopardizing technical consulting services, or logistic and administrative tasks. Unfortunately, companies often make an intuitive, uninformed decision: they put their Sales Engineers in charge of an increasing

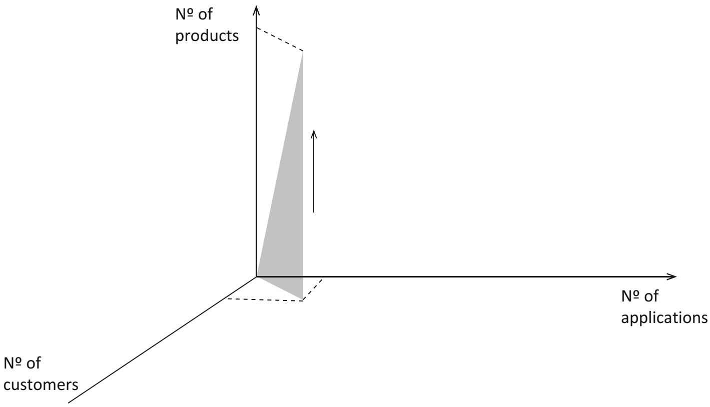


Fig. 7.15 Organic growth caused by an increasing number of products for a fixed number of customers and market applications. Due to cross-selling, this strategy requires a greater degree of coordination than in the two cases described above

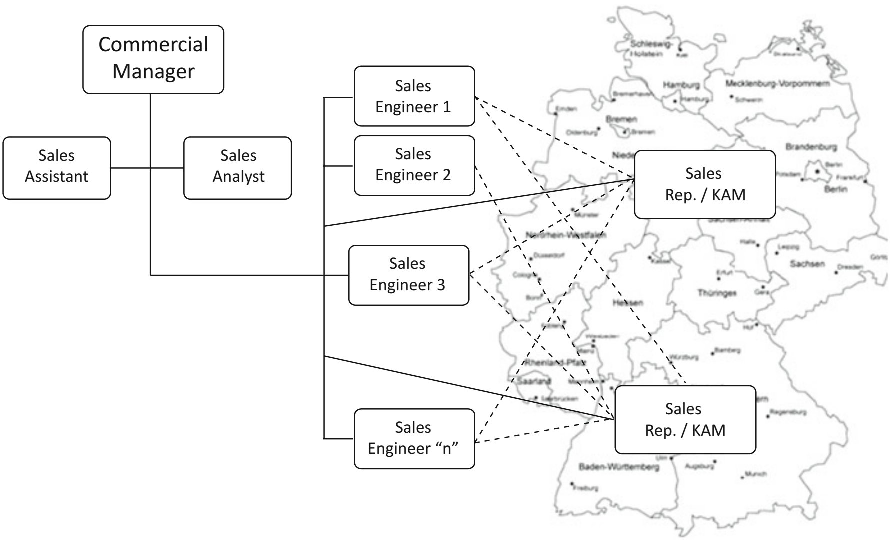


Fig. 7.16 Example of a sales organizational chart. This applies to industrial companies that provide an increasing number products to a fixed number of customers in a small number of market applications. Due to the potential for cross-selling, this requires a greater degree of coordination (represented by the *dotted lines*) than other, less complex situations

number of products and technologies. This causes Sales Engineers to lose focus and it trivializes their knowledge; furthermore, it makes customers lose faith in a company's technical competencies.

Case 4. A Small Number of Products for a Growing Number of Customers and Applications

Some small industrial companies that start off in circumstances very similar to Case 1 fall prey to product commoditization or decide to offer a product of lesser performance or robustness at a lower price. Alternatively, they may have created a revolutionary technology that's on its way to becoming widely used. This is shown in Fig. 7.17.

Many a customer in different market applications might choose to buy a mature, commoditized, or a product with lesser performance or lesser robustness. Some raw materials, for instance, are used in many applications (e.g. PTC, or periodic table commodities—or CCC, chemically complex commodities. See Chap. 3). On the other hand, in a few, very specific cases, a company may develop a new high-tech product with near-universal applications (e.g. flash memory, such as NAND and NOR). Whatever the case may be, having less products to commercialize helps a company avoid complex coordination. There are three possible ways a company can structure its sales force:

– Organize Sales Representatives according to applications or customer portfolios. This is a good option for companies with a commoditized product whose applications are mature and/or geographically dispersed. Insofar as the structural organization of the sales force, it should come as no surprise that different customer groups will require different complementary services.
– Application Managers. This is a good option for emerging high-tech products.
– Application Managers and Sales Representatives. The latter are assigned customer portfolios. This is a good option for commoditized products or emerging technologies that have complex applications and/or applications that are geographically dispersed.

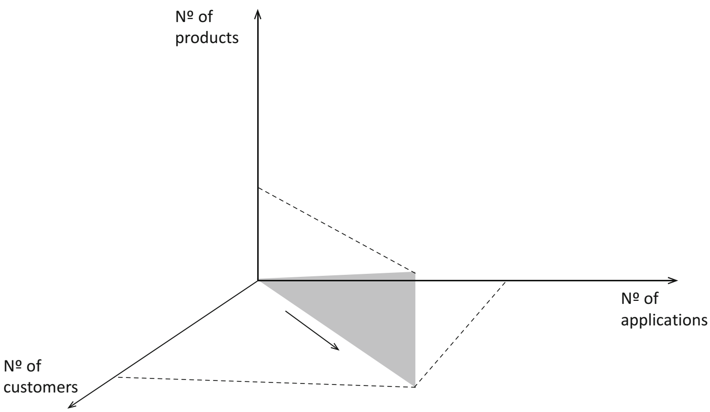


Fig. 7.17 Here, an industrial company's organic growth is caused by a small number of products that have accessed a growing number of new applications and customers

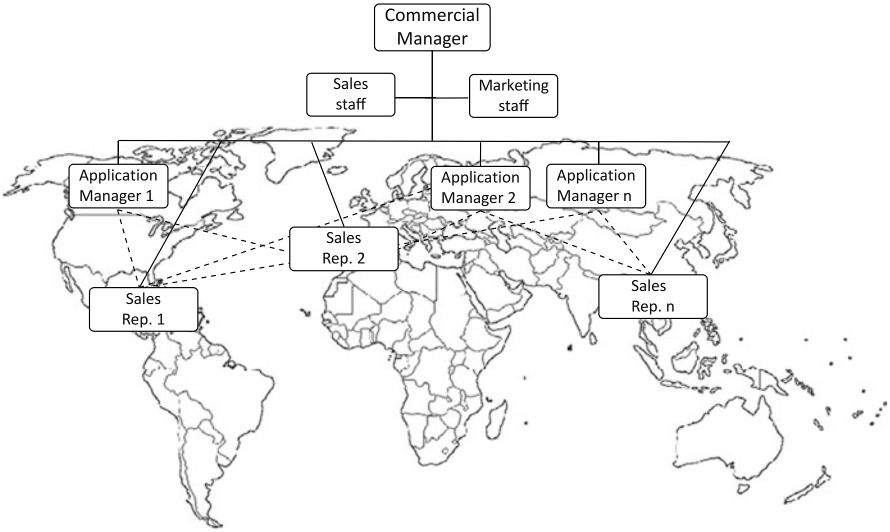


Fig. 7.18 Example of a sales organizational chart for Case 4. This applies to industrial companies whose growth strategy is to provide a small number of products for a growing number of applications and customers. Due to the potential for cross-selling, this requires a greater degree of coordination (represented by the *dotted lines*) than other, less complex situations. The global scale of this chart is only meant to serve as an example

Figure 7.18 provides an example of a sales organizational chart for this particular growth strategy. For the sake of simplicity, industrial marketing personnel are not included in this graph.

Some products may be difficult to manage and involve complex marketing variables, in which case, the marketing department may want to hire Product Managers.

This scenario is more complex if a company sells its products through intermediaries. In that case, a company's sales force can include personnel who are exclusively dedicated to managing the industrial channel. This frees up the Sales Engineer from having to deal with the logistics and administrative tasks of channel management (see Fig. 7.9).

One further note: as discussed throughout this volume, an industrial marketer needs to be cautious if their company is offering a small number of product designs (either high-tech, or commoditized) for a large number of applications. This situation is risky and, with enough time, unsustainable.

Case 5. A Large Number of Products and Customers, and One or Two Market Applications

This growth strategy is for companies that hone in on their target applications: these companies penetrate their markets by offering diverse product lines to a wide pool of customers. In practice, the market size for these applications needs to be big enough so that a company can grow. Other times, a company will have to penetrate the global market (e.g. port machinery and equipment). This is represented graphically in Fig. 7.19.

Given the large number of products and customers, a company has the option of coordinating cross-selling. This book recommends using one of the following organizational structures for sales:

– Sales Engineers coordinated by Sales Representatives. The latter are assigned to customer portfolios or geographic regions. They are in charge of coordinating Application Managers and Sales Engineers. This specifically applies to companies that have a small number of dissimilar and technically complex target applications.

Sometimes, customers may require more of a supplier's time and administration, in which case, a company may decide to assign a KAM (Key Account Manager). This frees up Sales Engineers who might otherwise get overwhelmed by a few customers.

Figure 7.20 provides an example of a sales organizational chart for this particular growth strategy. For the sake of simplicity, industrial marketing personnel are not included in this graph.

Some products may be difficult to manage and involve complex marketing variables, in which case, a company may decide to hire Product Managers (who have general management responsibilities for a product line).

This scenario is more complex if a company is sells its products through intermediaries. To that end, a company's sales force can include personnel who are exclusively dedicated to managing the industrial channel. This frees up the Sales Engineer from having to deal with the logistics and administrative tasks of channel management (see Fig. 7.9).

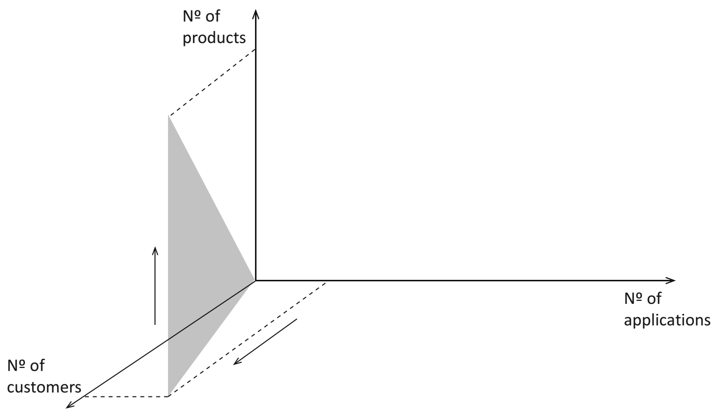


Fig. 7.19 Organic growth caused by a large number of products, a large number of customers, and a relatively small set of target applications

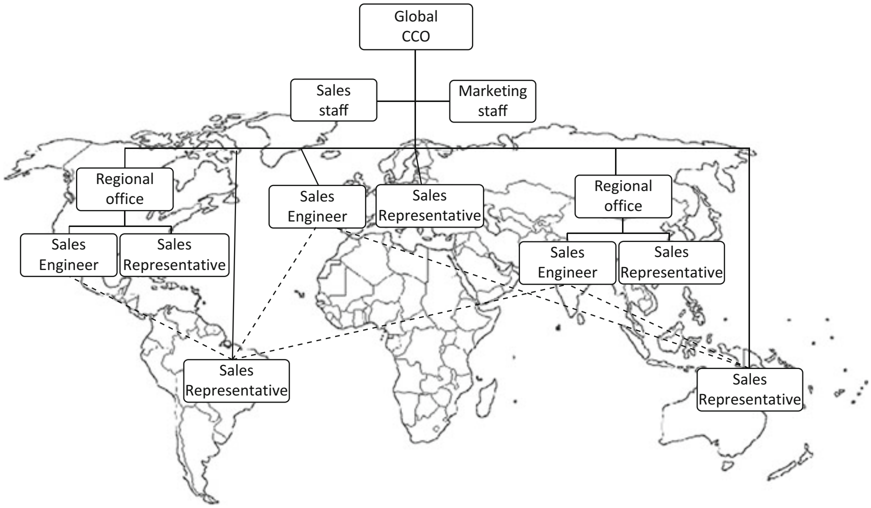


Fig. 7.20 Example of a sales organizational chart for Case 5. This applies to industrial companies whose growth strategy is to provide a large number of products to a large number of customers in one or two market applications. Due to the potential for cross-selling, this requires a greater degree of coordination (represented by the *dotted lines*) than other, less complex situations. The global scale of this chart is only meant to serve as an example

Case 6. A Large Number of Applications, Customers and Products

Assuming that companies start off in a position similar to Case 1, this type of organic growth can be complex and risky if done too quickly and without proper planning. Indeed, it can even be fatal for a manufacturer that isn't sufficiently prepared. As such, this type of growth is best suited to distributors, wholesalers and/or importers in industrial markets that experience rapid growth.

One strategy to avoid unplanned sales growth is for a company to increase its product (or product line) specialization. This is no easy task; a company in this situation is usually dealing with numerous product lines, numerous customers, and numerous applications. This is represented graphically in Fig. 7.21.

Cases like this one involve complex sales administration. Sales administration has to take into account things such as cross-selling potential, the extent of geographic coverage required for reaching customers, the technical and administrative complexities of different products, managing relationships with large-volume customers, and the degree of technical needs that certain market applications require. Given all of the above, this volume recommends using one of the following organizational structures for sales:

– Sales Engineers coordinated by Sales Representatives. These Representatives are assigned to customer portfolios or geographic regions.

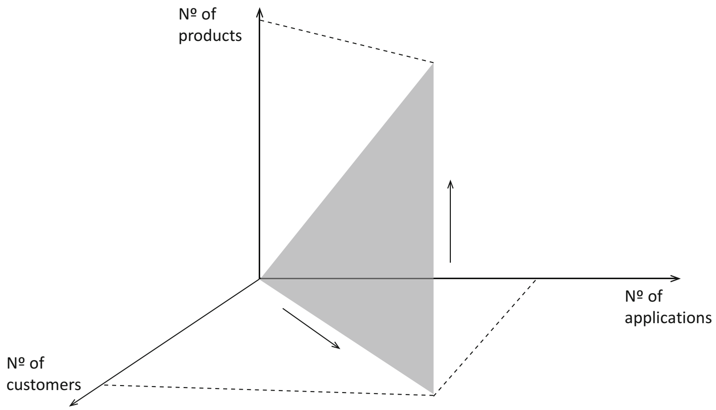


Fig. 7.21 Organic growth caused by having numerous customers, applications, and products. This type of growth is typical amongst certain generalist distributors. If a company doesn't follow an established growth plan, then it risks damaging its commercialization program and presenting a disorganized offering

– Sales Engineers work with Application Managers to develop niche markets (or specialized applications) while Sales Representatives are assigned to customer portfolios or geographic regions. In this case, Sales Representatives are responsible for coordinating cross-selling between a company's numerous products.

Figure 7.22 provides an example of a sales organizational chart for this particular growth strategy. For the sake of simplicity, industrial marketing personnel are not included in this graph.

This proposal is meant to address the increased complexity of products, applications, and customer administration. Additionally, if products are difficult to manage or involve complex marketing variables, a company may decide to employ Product Managers (to generally manage a product line).

This scenario is more complex if a company sells its products through intermediaries. To that end, a company's sales force can include personnel who are exclusively dedicated to managing the industrial channel. This frees up the Sales Engineer/Application Managers from having to deal with the logistics and administrative tasks of channel management (see Fig. 7.9).

Determining the Right Number of Sales Personnel

General and Commercial Managers are constantly trying to figure out how many sales personnel their company needs. Coming up with the right answer isn't so much about doing precise calculations (which are relatively easy to do). Rather, it's more about the criteria used to do those calculations. Managers can decide what

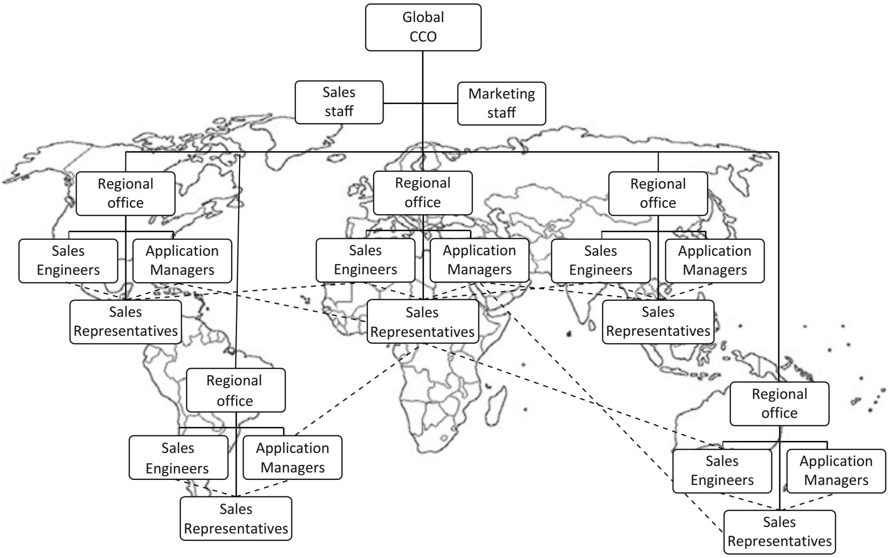


Fig. 7.22 Example of a sales organizational chart. This applies to industrial companies whose growth strategy is to provide a large number of products to a large number of customers in a large number of market applications. Due to the potential for cross-selling, this requires a greater degree of coordination (represented by the *dotted lines*) than other, less complex situations. The global scale of this chart is only meant to serve as an example

criteria to use by accompanying the sales force on its visits to customers' facilities. In order to determine how many sales staff a company needs, some important things to consider are:

- Whether their products sell regularly, or whether they're only offered on a made-to-order basis (that is, on a per project basis). Some projects are very technically complex, and may require more of a company's time and coordination. The complexity and estimated number of future projects is directly related to how many Sales Engineers a company employs.
- The number of target applications and target customers.
- The number of people at a customer's company that a supplier should contact. This includes a customer's specifiers, regardless of whether those specifiers are part of the customer's organization or are outsourced.
- The geographic location of these contacts. This allows a company to estimate how much time and resources it needs to invest in customer visits and after-sales services.
- Number of intermediary firms (distributors, integrators, etc.) between a company and the end-user.
- The geographic location of intermediaries.

In turn, the following information can be used to determine each Sales Engineer's workload:

– What activities should a company do during customer-visits? (A company should determine what kinds of activities are required for new customers, new projects, customers in the customer portfolio, specifiers, distributors, integrators, contractors, etc. For more information, see Chap. 8).
– On average, how much time should a Sales Engineer or Sales Representative (or both) spend with a customer?
– How many customers should the Sales Engineer or Sales Representative meet with each day (and month)? (When calculating this number, a company should assume that there's gong to be inactive periods due to distance and downtime).
– What are some non-delegable activities that the Sales Engineer needs to do on a daily basis within his/her organization? (Write reports, prepare proposals, quote prices, calculate specifications, coordinate other areas of the business, etc.).

One of the first things a company should determine is how many Sales Engineers or Sales Representatives should be assigned to each customer portfolio. Or, put another way, how many customers will be in each Sales Engineer's or Sales Representative's portfolio. For more information on the Sales Engineer's role with customer organizations, the reader can refer to Chap. 8 of this book.

Whoever is designing the organizational structure for the sales force needs to realize that the sales force's primary commitment is to customers, not to administrative tasks within the company. Any paperwork or administrative tasks that can be delegated, should be delegated! This allows the sales force to spend more time working in the field. As such, a company may want to consider hiring a Sales Assistant.

A Sales Assistant does whatever they can within the organization to make sure that the Sales Engineer can continue working in the field, close to where the product is being used and close to customers. So long as they have a structured and reasonable workload, a single Sales Assistant could potentially assist multiple Sales Representatives.

By now, the reader will have realized that a sales force is designed step by step, from, so to speak, the 'trenches on up to the generals'. Thus, the number, dispersal and complexity of products, customers, and the industrial chain are what ultimately determine how many Sales Engineers and Representatives a company needs and the professional traits they require. In turn, the number and complexity of sales force personnel determines how many sales assistants a company needs, and whether they should employ an ad hoc Sales Manager.

Small industrial companies with relatively few sales personnel may not need a Sales Manager. This role can be taken over by the Commercial Manager.

However, if a company employs numerous sales personnel, all of whom are geographically dispersed or have different responsibilities at different points in the industrial chain, then it may have a hard time managing its sales department properly. This is when a company should think about hiring a Sales Manager. Additionally, depending on how sophisticated sales information needs to be and the complexity of sales management, a company may consider creating one other position: Sales Analyst. The Sales Analyst gathers together all of the diffuse information from Sales Representatives and enters it into an information software (software specifically designed for this type of management). He/she creates databases, collects customer data, creates graphs showing sales performance for different variables, cross-references information, identifies trends, etc.

The Organizational Structure of an Industrial Marketing Department

The organizational structure of the industrial marketing department is just like any other respectable organizational structure—it needs to be based around the department's *functional responsibilities*. In other words, the first step to designing the organizational structure for this department is asking: what kind of organizational structure will allow the industrial marketing department to do what it needs to do?

Below is a list of factors that affect the structure and size of an industrial marketing department:

- The vertical complexity of the industrial chain (e.g. whether it includes distributors, integrators, installers, etc.). A company needs to research, train, and promote their offering to members in the industrial chain.
- The number of products a company offers, or is going to offer, to customers: the Product Plan indicates the total amount of effort that goes into new product development and market introduction.
- The degree to which products are specialized for specific applications. Each product line merits its own specialized business plan.
- The technical and administrative complexity of a company's products. The greater the administrative complexity (that is, the greater the number of independent supply and commercialization channels), the more a company will need to employ personnel specifically dedicated to products or product lines (e.g. a Product Manager).
- The number of applications (uses) that a company's products have. The Discovery Team will have more to manage and they'll need to develop a business plan for each application/product.
- The number of customers in each target application. The more customers there are per application, the more time and enhanced coordination is required for Discovery Team tasks.

The industrial marketing organization looks good if:	There is no serious industrial marketing if
• Marketing personnel coordinate and/or participate in the Discovery Team activities.	• The marketing office is composed of "spread sheet" analysts who make reports for senior management.
• Marketing personnel propose, lead, and coordinate the market segmentation program.	• Industrial marketing is understood as a sales analysis unit.
• Marketing personnel participate actively in prioritizing products to be developed by the company (the product plan).	• Market research is done by hiring a "surveying company" once or twice a year.
• Marketing personnel also participates in the new product development process.	• Marketing is considered as the people who organize trade shows, design the web site, brochures, and corporate gifts (pens, balls, caps, etc.).
• Marketing personnel lead and participate in the product introduction program.	• The R&D department performs its own market research to obtain real specifications from customer needs.
• Marketing personnel lead and participate in the value-based pricing process, and do it by permanently checking and actualizing it.	• New products are assigned to each sales people's portfolio because "only them can introduce them to the market".
• Marketing personnel investigate, design, propose, control and evaluate intermediate companies such as distributors.	• Price has little or nothing to do with marketing and is only calculated by using the "cost plus" method.
• Marketing personnel designs, coordinate and analyses the market information obtained from activities such as Discovery Teams, sales and after sales.	• Distributors are hired because they already distribute similar products.
	• Market segmentation is based only on purchasing behavior: purchase volume, price elasticity, etc.

Fig. 7.23 Comparative table between two types of organizational structures for an industrial marketing department. On the *left-hand side*, marketing personnel and higher-ups perform strategic functions. On the *right-hand side*, marketing personnel and higher-ups perform accessory/ cosmetic functions

Unlike the organizational structure of the sales force (which, in a sense, is done from the bottom up), the structure of a company's (or SBU's) industrial marketing department is based around the sum of activities that need to be planned and executed. To that end, a company should begin by outlining what it expects the head of marketing and marketing personnel to do (this includes responsibilities and activities). See the table in Fig. 7.23.

The organizational chart in Fig. 7.24 shows a potential organizational structure for an industrial marketing department. In this example, a company offers multiple products that go through multiple distribution channels and, ultimately, are used for a variety of applications. This example assumes that the sales department can also be structured around these market characteristics.

It's important to warn the reader that conservative companies often get anxious about designing a new organizational structure for their marketing and sales department. After all, changes to a company's organizational structure are bound to result in issues such as: promotions and demotions (tacit or not), rearrangements, layoffs, hiring of new personnel, changes to people's tasks and responsibilities, new processes and procedures, new resources, etc.

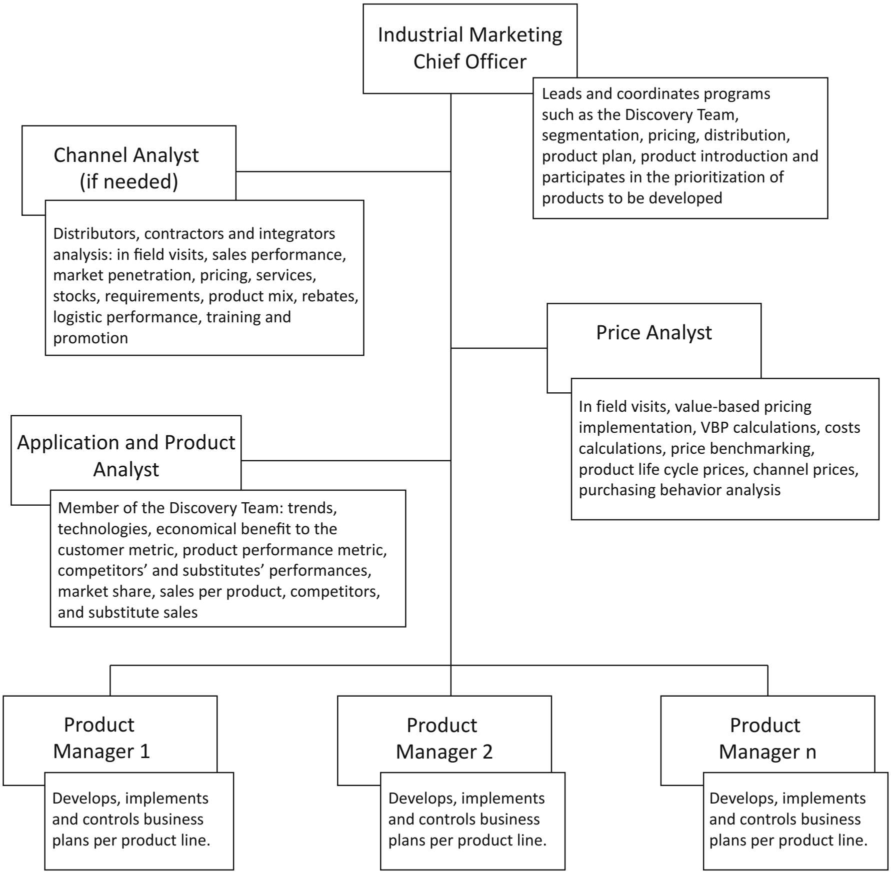


Fig. 7.24 Example of an organizational chart for an industrial marketing department. This organizational chart works best for companies with complex markets: intermediaries, distributors, and contractors, and multiple products for multiple target applications

Sadly, companies are often unaware of how much their poorly structured marketing and sales departments are costing them. Not because these costs aren't significant (low sales, low market share, unsatisfied customers, etc.), but because they tend to attribute them to other causes.

8 The Industrial Sales Force

Introduction

Historically, industrial companies have thought of their sales staff as stock clerks—people whose job it is to 'stock' the market with the company's goods. Companies would hold their sales personnel directly responsible for how much they sold and whether or not they reached expected quotas. If the business wasn't selling enough, it was because salespeople weren't doing their job. Companies used to blame their salespeople for being lazy, incompetent, or lacking the charisma and 'charm ' to sway potential customers.

In the past, industrial salespeople were known for being very socially adept. Their customers weren't just their customers, but rather, in their own words, their 'friends'. Customers would choose certain salespeople over others and, not coincidentally, would receive lower prices as a result.

Not to mention, salespeople were a major (if not the only) point of contact between a company and its customers.

Insofar as industrial sales practices, academia wasn't that much better. The prevailing view in books and business schools taught salespeople and managers to follow a particular selling process: a sales representative would implement a series of unilateral activities for a receptive and passive customer. As such, the salesperson merely followed a script and, hopefully, the customer responded favorably to whatever incentives they were given.

However, things are changing and many progressive industrial companies have long since rejected this point of view.

Today, an increasing number of industrial companies are beginning to realize that their sales personnel are actually *consultants* and that the success of their work depends on customer professional collaboration. Moreover, these companies are starting to realize that what really drives product sales are the demonstrable benefits that a product provides during its service life.

When an industrial marketing department has a good understanding of the market, when it translates that understanding into terms a company can understand,

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_8

allowing the company to design better products and successfully introduce them onto the market—then sales activities become more professional and stop relying on *social selling tactics*. In other words: the better a company's industrial marketing, the less they'll have to rely on persuasive and manipulative sales techniques.

Selling, then, is everyone's responsibility.

It's the Sales Engineer's job to find and identify potential customers—customers who would benefit from the functionalities and attributes of a company's products. It's their responsibility to make sure that the future offering fulfills customers' needs and, if necessary, demonstrate and educate customers on the benefits a product provides for such-and-such application.

Yet, this is hardly a unilateral process. If a customer's problem isn't pressing, or if the customer isn't willing to share research and information about their circumstances or work with a sales representative to find the right solution, then there's little, or nothing, that the consultative salesperson can do. Over the course of the sales process, both customer and supplier are learning from one another and building rapport. When a customer puts in a purchase order, it's up to both of them (supplier and customer) to sort out the details and work together to make sure that over time, the product provides its benefits as promised. Progressive customers need progressive suppliers in order to offer progressive solutions *to their own customers*. This is not the time or place for wrestling, arrogance, or elitist attitudes.

This was an insight of Frederick Webster in the mid-twentieth century when he wrote, "a sales representative is one of a company's competencies for solving customers' problems and creating satisfied customers."[1]

As a result, one would be hard-pressed to find a company that offers mediocre products yet has a competent and professional sales force. This kind of discrepancy would conflict with the professionalism of sales personnel, who wouldn't last very long; they'd feel uncomfortable offering a mediocre product or constantly coming up with excuses for dissatisfied customers. It's much easier to find companies that make outstanding products but that don't fully understand what the sales force is supposed to do or how it should be structurally organized. The concepts and procedures discussed in this chapter are dedicated to the latter type of company.

The Purpose of an Industrial Sales Force

One look at the promotional expenses of any number of consumer market companies and it quickly becomes clear that the vast majority of this money is spent on advertising in its various forms. At industrial companies, however, a significant portion of their selling expenses goes towards sales force salaries and activities. So, why don't industrial companies rely on advertising and merchandising to generate sales?

The reason is more complicated than one might think. The problems that industrial customers face are becoming increasingly complex. And, as a result, industrial

[1] Industrial Marketing Strategy. Frederick E. Webster Jr. John Wiley & Sons. 1991.

customers require increasingly sophisticated products and services to solve these problems.

For instance, just a few decades ago, the functionality of a flow control valve was based on designs and calculations that had to do with its physical properties. These days, designs for flow control valves rely on any number of different sciences: electronics, electromagnetism, materials sciences, chemistry, physics, control modules and softwares. These sciences have become key factors in the valve's design; they've changed how the valve performs and they've altered customers' expectations of what the valve can do for a particular application.

Even when a product has been specially designed for a particular application, each customer will inevitably have different usage or installation conditions. A supplier will need to assess these conditions and, if necessary, make adjustments to the product's technical specifications. What's more, a customer may not be aware of the nature of their problem, adding further complexity to their discussions with the supplier.

The Industrial Purchasing Process from Beginning to End

Dealing with these problems takes time. There's the time it takes for professional technical iterations between supplier and customer, for finding and understanding a problem/opportunity, for studying the problem in depth and researching possible solutions, and, lastly, for communicating the best solution and internalizing it.

Even if promotional messages contained enough information to fill a book, it's unlikely that they'd be able to foresee all of the possible situations that could come up. These situations need to be identified and resolved and they require human ingenuity in order to do so. A customer's purchasing needs are a part of this process.

Figure 8.1 shows a standard process that culminates in a customer purchasing need. Given how infinitely varied customer-supplier relationships can be, the reader should think of Fig. 8.1 as a generalized process that can be adapted to each particular situation. Understanding this process is important. It helps a company figure out what its technical-professional sales force needs to do. Thus, what follows is a description of each of the 11 stages in this process. This includes a description of the customer's experience of this process, as well as the Sales Engineer's.

1. Problem formation. Nobody in their right mind wants problems or tries to make problems for themselves in their own business. Most problems form unexpectedly while company executives and technical professionals are busy working on their own projects. Progress, or a lack thereof, inevitably creates problems within a business. Problems might develop slowly over a number of years, or they could crop up in a matter of seconds, with or without apparent symptoms, and for immediate, or not so immediate, causes.

Oftentimes, problems start off in other places, other applications, or at unrelated business organizations, and a company only discovers that they've got a problem by communicating and learning from others. Here, some readers may prefer to use the term 'opportunity' instead of 'problem'. This applies to cases in which a customer

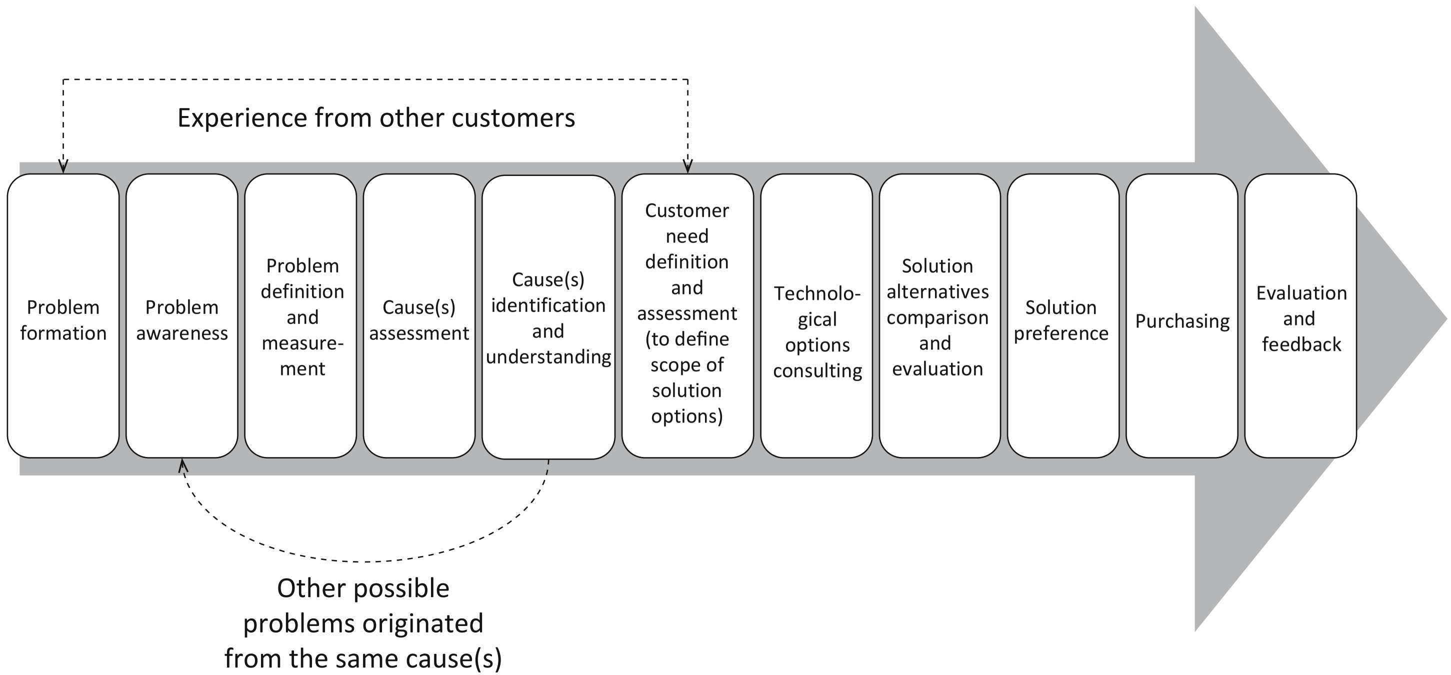


Fig. 8.1 Proposed model of the process that a company goes through from the moment it detects a problem to when it acquires the technology to fix it. Inevitably, all companies have to go through each of these 11 stages; however, the timing of these stages varies from case to case

company is experiencing a ‘needs gap’ with its *own* customers, and requires new developments in order to address it. To do so, the customer needs its suppliers to provide new and improved products/services. Of course, linguistically speaking, ‘opportunity’ and ‘problem’ are very different terms. However, for the sake of simplicity, the reader can use them interchangeably during the purchasing/selling process described below.

A problem is most visible when it develops into a crisis (a harmful event) at a company’s facilities, offices, or workplaces. For example, take companies that have limited resources for equipment maintenance and repair. The Chief Operations Officers at these companies will intuitively know that problems are forming, and they might even be able to pinpoint what these problems are, when they’ll appear, and how severe they will be.

In this instance, the company is already aware of the problem and they’ve entered into Stage 2 of the overall process.

2. Awareness of a problem/opportunity. There’s usually some catalyst that makes people aware of a problem. Someone learns about an existing symptom and from then on, the company knows that the problem exists. This information might be revealed internally (by a company employee) or externally (academia, a supplier’s sales force, a colleague, etc.). Sometimes, it manifests itself as a crisis (e.g. a workplace accident), other times it’s something more intangible (e.g. an increase in costs) or tangible (e.g. property damage). The problem might be technical, administrative, financial, or due to human error, etc. Most of the time, however, companies are taken by surprise when symptoms or a crisis first appear.

If a particular problem has already been detected at other companies and is common knowledge among industry professionals, then the company may already be aware of the problem ahead of time.

In order to leverage this kind of information, companies often hire expert engineers during a project’s design phase. Other times, however, customers and suppliers know about a problem for a long time but, either because the technology to solve the problem doesn’t exist, or is too expensive, or because suppliers don’t think it’s important enough to develop a product to fix it, the problem remains unresolved.

For some companies, awareness of a problem isn’t enough to spur them to research the problem or try to fix it. This might be because of their laid-back organizational culture or because they’re unaware of how big and far-reaching the problem is. Either way, the decision-makers at these companies carry on with business as usual, letting things get worse, and doing their best to ‘patch up’ the symptoms. There are other companies, however, that don’t take any risks. They immediately start trying to understand the problem, its scope, and its causes. Before long, these companies are on the phone with suppliers, trying to figure out what’s wrong and how to fix it.

3. Define and measure the problem. This stage is about understanding the problem. A company needs to understand exactly what has happened, either at their own company or at other companies that have experienced the same issue. The problem should be stated explicitly and key metric variables should be measured. Since a company tends to only be familiar with its own processes, it may need help understanding the problem. It may need assistance or a consultant who can help the company understand a given piece of equipment, software, chemical reaction, mechanism, structure or whatever else is contributing to the problem. Naturally, the first thing a company should do is contact the supplier of the item in question, from whom they may or may not receive valuable information. Usually, this assessment stage helps a company understand the problem, although it won't necessarily lead to a solution.

It's not uncommon for suppliers involved to argue that a problem is caused by a deficiency at another step in the customer's process, or is caused by a misused product, improper supplies, a lack of maintenance or updates, a change to the agreed-upon conditions, etc.

Other times, the supplier will take matters into their own hands and, either explicitly or implicitly, offer some compensation. However, this doesn't guarantee that the supplier will assume financial responsibility or that the problem won't happen again. Quite simply, it could be that a particular product/service design isn't appropriate for the application in question.

The customer company should measure the scope of the problem, or the potential problem if they're conducting a preemptive study. This can be easy or difficult to do, depending on whether doing so requires specialized equipment, measuring instruments, or personnel. This stage is very important for helping a company decide how to mitigate or avoid the problem.

4. Investigate the roots of the problem. Depending on the size of the problem (or the potential problem), more sophisticated companies generally use scientific research methods for this stage. Here, companies can design protocols for identifying and understanding a problem's *root causes*. In order to do this, companies will need to get input from experts, such as their own technical professionals, or from suppliers or potential suppliers.

Naturally, whoever has been affected by the problem or is in charge of fixing it will want to get as many opinions from as many different sources as possible. With time, these professionals will get better and better at recognizing when potential suppliers are being manipulative, biased, or self-interested. Likewise, they'll learn to seek out the Sales Engineers at the supplier's company who don't discredit a competing product, who are passionate about technology, and are driven to finding the root cause of a problem and helping out the customer.

Customer's people in charge of finding a solution to the problem often end up highly appreciative of the help they get from a supplier's personnel. These personnel will have helped them conduct their research without expecting a purchase order in return.

With regards to the problem, there might be several different things that, either directly or indirectly, are causing it. There's extensive business literature on how to determine causality, so this won't be discussed here. By the end of this stage, a company should be able to identify the cause(s) of their problem.

5. Understand the causes. A customer professional can detect and identify a problem's root cause, but they may not understand it. Sometimes, customers in related applications have problems that derive from the same root cause, but this isn't always the case. Problems can be caused directly (e.g. rolling bearings that can't withstand high temperatures and that, once they break down, hold up the entire production line) or indirectly (e.g. a motor and its rolling bearings are submitted to excessive temperatures). Once researchers have singled out a cause (or multiple causes), they should assess whether it's generating other, parallel problems (these problems may turn out to be more or less serious than the problem already identified). In Fig. 8.1 this is represented by a black arrow connecting the 'identify the causes' stage to the 'awareness of new problems' stage. Other business organizations may already have experienced the same problem, in which case, they'll probably have researched its causes. If so, this information may be freely available for a company to review.

Generally speaking, companies that supply the technology that fixes a problem will be sure to let their customers know about the issue.

From a psychological standpoint, once company members understand what's causing a serious problem, odds are someone will take the blame for it and assume responsibility. In some organizational cultures (e.g. some Confucian cultures), identifying a problem's cause is considered an opportunity, and as such, they avoid punishing those involved. These cultures know that punishment will make people less willing to come forward about problems in the future and will get in the way of proper research into a problem's root causes. In other cultures, however, learning about the cause(s) of a problem can create a lot of anxiety amongst personnel.

6. Define and quantify the need. At this stage, well-organized companies should be able to state what they expect qualitatively and quantitatively from a solution. This 'needs statement' should be ambitious but realistic. Methodologically, it's best if this statement focuses on minimizing the problem. The risk is that if a company's needs statement attempts to tackle the cause directly, then the company limits itself to certain technologies in order to solve the problem. Of course, sometimes it isn't appropriate to minimize a problem, and doing so could end up being more costly and harmful. In these kinds of situations, a company has no choice but to tackle the cause head-on.

Companies should calculate the total amount of damages or lost opportunities caused by a problem. If the problem resulted in a workplace accident, then the company's needs statement should focus on how to achieve 0 total accidents. If the problem resulted in higher costs, then the needs statement should focus on a cost percentage decrease over a certain amount of time, etc. Other needs may require measuring technical or administrative performance. It's very important for the needs statement and needs metrics not to privilege any one technological solution over another—that way, a company can freely consider other competing, or substitute, technologies.

7. Research different potential technological solutions. This stage requires customers to be quite open-minded and technologically knowledgeable. This allows them to assess different types of technologies from different suppliers or fields of science. Before a company can start evaluating different technologies and comparing them to one another, it needs to make sure its put all the options on the table. Assuming that a company does its research properly, it should also consider different substitute options that comply with local regulations. Here, it's easy to tell which organizations are more conservative and which ones are open to thinking about new technological solutions. Whatever the case may be, it's a good idea for companies to get their creative thinkers involved in this stage.

The reason this is important is because it's not easy to identify all of the possible technological solutions. Whenever a customer meets with a supplier, they'll be wary that the supplier is just trying to promote its own product and is withholding information about other possible solutions. Unfortunately, there's still a lot of industrial salespeople that behave this way, which makes potential customers even more suspicious.

A customer's engineers should use all of the research tools available to them: they should consult colleagues in their industry, engineering consulting firms, the Internet, opinion leaders, academics, etc. Gradually, the customer will familiarize themselves with these technologies, the advantages and disadvantages of each, their potential costs, as well as the standards and norms that regulate them.

8. Evaluate and compare potential technological solutions. At this stage, the company tackling the problem needs to design protocols for evaluating and comparing the various competing, or substitute, technological solutions. These protocols should be multidisciplinary and should include things such as: technical, logistic, and financial considerations, the initial cost, total cost, guarantees, any previous and related experience with suppliers, how new, stable or consolidated the technology is, any past successful or failed cases in which the technology has been used, installed capacity and response capacity, the product's service life, etc. Some criteria require making qualitative comparisons between products. For example, a company may want to compare their employees' ability to handle and operate different technologies. In certain cases, a company may want to send its technical professionals out into the field to visit facilities where a given technology is being used. That way, a company can get thoughts and opinions about the technology from real users. Of course, there are many factors to consider, and it can be easy for a customer to get lost in the details or spend time focusing on less important variables. The most important variables are the ones that have to do with the needs statement and with the expected results (these results, and their metrics, will already have been stated during Stage 6 of this process). These should be the most heavily weighted variables in a company's assessment.

On the other hand, the multidisciplinary team should be aware that some technologies may affect an application in other ways, beyond just solving the problem, and that these effects can be positive or negative. A company should consider these effects, and their quantifiable results, during the evaluation.

9. Chose the preferred technology or preferred supplier for solving the problem. During the previous stage, a company will have gone through exhaustive qualitative and quantitative analyses. Now, after much heated discussion, it's time for the company to choose its winner.

There will be times when company members disagree about how to deal with highly important problems and solutions. When this happens, those who have argued in favor of the winning technology need to realize that the responsibility falls on their shoulders: the technological solution truly needs to work as promised. Likewise, this is also true when deciding which supplier to use. At this stage, a company may find itself debating between two technologies or suppliers, with a separate group of company members advocating for each. In order to determine which technology is best and design its technical specifications, a company should hold regular meetings with suppliers and perhaps independent consultants.

Once a customer company has decided which technology is the best fit, or which one best resolves the stated and measured problem, then it's time for their engineers to get to work. This is when engineers outline the performance requirements for the winning technology (suppliers will be fully expected to comply with these requirements). This outline is known as a product or service's 'technical specifications' and it details the characteristics and/or performance requirements that a product/service needs to have. A customer's engineers (or specifiers) will advise decision-makers at their company to see these as bare minimum requirements for choosing between one supplier or another. If a customer's engineers aren't sure about the right technical specifications for a product/service, they can either contract independent experts or trust their suppliers to provide them with the right information.

Meanwhile, customers should ask suppliers for a formal quotation, which should include information such as: price, payment methods, logistics conditions, product warranty contracts, the return policy, installation and training, after-sales, maintenance and spare parts availability, certificates of regulatory compliance, etc.

10. Acquire the technological solution. Once a company has established its technical specifications, it should request formal quotations from possible suppliers. Sometimes, this is just a logistical formality. Oftentimes, for strategically important products, a company already knows which supplier it wants to work with.

Other times, this gives suppliers the opportunity to compete with one another, and offer better prices and better conditions. And, in still other cases, a company can use its most skilled negotiator (not to mention its best price wrestler) to secure lower prices from a preferred supplier.

Once the purchase order is sent in, the agreement is closed and/or the supply contract is signed, then the supplier company begins operations to manufacture and/or ship the requested product.

The stages described in brief above, all of which are part of a company's technology adoption process, can also be looked at from the point of view of consultative selling.

It's important for a supplier's engineers to understand that the purpose of their product is to solve a *problem/challenge*, and that solving a problem means dealing with its *causes*, be these direct or indirect.

As discussed earlier, a proactive supplier first learns about a problem and its formation through market research (this book has focused on the Discovery Team© method). Armed with these discoveries, an industrial manufacturer either decides to improve its product or develop a new product that solves the problem. For the purposes of this discussion, this book is going to assume that the product/service has already been developed and is currently being used by different customer companies. Now, it's the sales force's job to promote the solution to the rest of the target application. Throughout the iterative process described above, the industrial sales force is responsible for carrying out several different activities. These are shown in Fig. 8.2.

The reader is welcome to adapt this process (and its contents) to meet the needs of their own industrial business.

This calls for a clarification. By no means should the manufacturer think that the sales force is the only one responsible for these activities. Throughout the stages described above, the sales force is in charge of coordinating and mobilizing a much wider pool of professionals within their organization. For example, the sales force might need help from Application Engineers, Product Managers, or Functionality Managers. And, when researching different customers' problems, they'll do so alongside personnel from production, logistics, R&D, and upper management.

Below is a description of activities that are commonly conducted by a consultative sales force. These activities take place throughout the process shown in Figs. 8.1 and 8.2.

The Industrial Selling Process from Beginning to End

At this point, it's important to look at the various industrial marketing tools that lend support to consultative selling. The industrial marketing department uses concepts and tools (e.g. the product-application matrix. See Chap. 5) to figure out which applications to target. These are the applications where the product will provide the most benefits and have the greatest competitive advantages. The most effective sales tool of all is simply a product that is well-suited to a specific application. Or, put another way, if a product is ill-suited to an application, then it shouldn't be sold. If it is, a supplier should be prepared to deal with conflicts and a loss of credibility with customers.

Who should the Sales Engineer meet with on their first visits to a customer's organization? To answer this question, the Sales Engineer has to do some preliminary research. He/she needs to determine who is most harmed by the problem in question. Different problems can harm different people in different ways. Some people may be indifferent to a problem, while for others, the *solution* itself might seem like a hassle or a threat. See Fig. 8.3. Having this kind of information helps a Sales Engineer plan their visits and presentation.

When preparing to visit a customer's facilities, there's one thing that a company can always count on: customers have lots of problems, and some of them may be more pressing and important than the one the supplier is trying to solve. A central part of the subsequent iterative process is understanding the relative importance of a problem. Insofar as the relationship between these two, the Sales Engineer and their team should always think of the customer and the customer's team as their professional *colleagues*.

1. **The sales force and the formation of a problem at a customer's company**. Problems always start to form in specific applications, places, or under certain conditions. If suppliers are sufficiently proactive, then their Discovery Teams

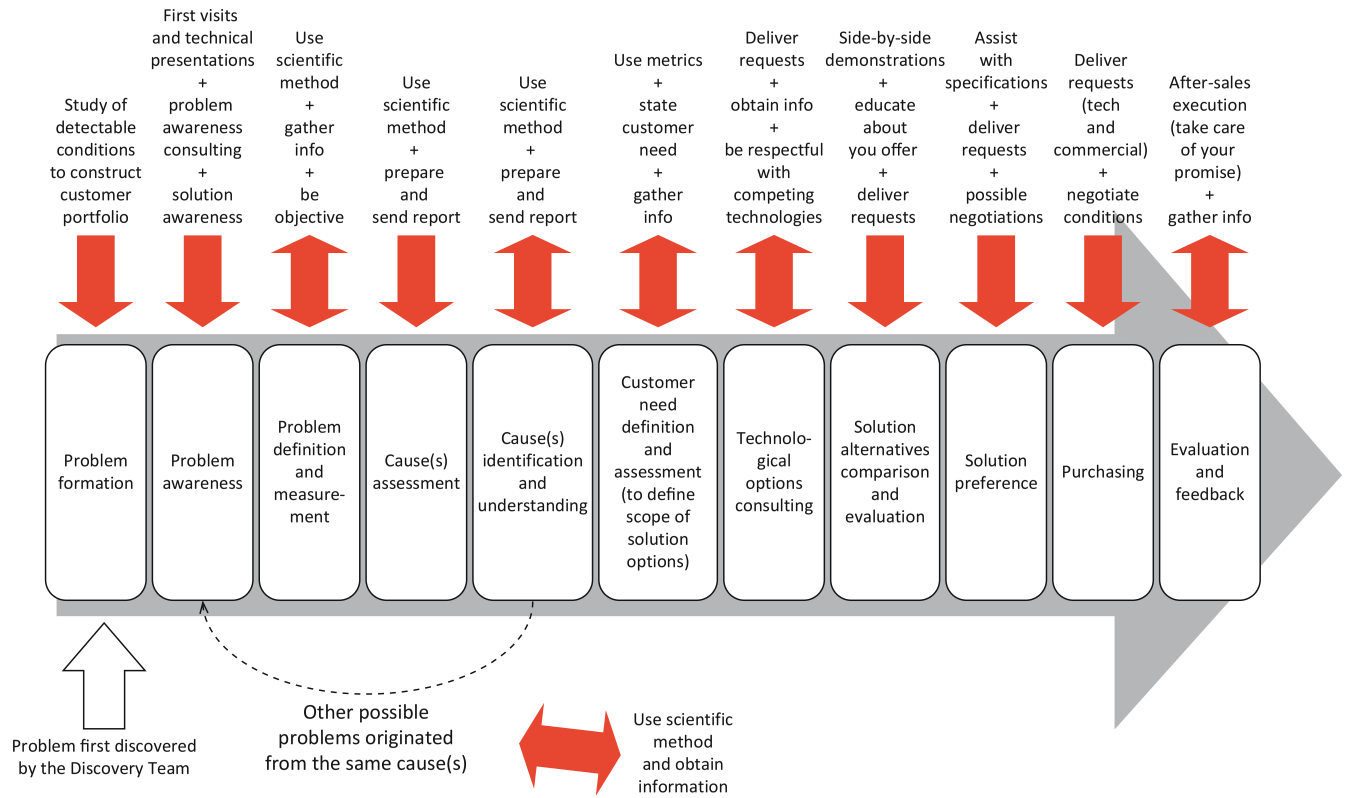


Fig. 8.2 Consultative sales force activities that take place throughout the customer's technology adoption process (represented by *one* or *two-sided arrows*). It's important to point out that often times, the sales force operates as a multidisciplinary team that is both technical and commercial. As such, they help research different customers' problems, search for new problems/opportunities and their causes, conduct the proper assessments, and develop new offers

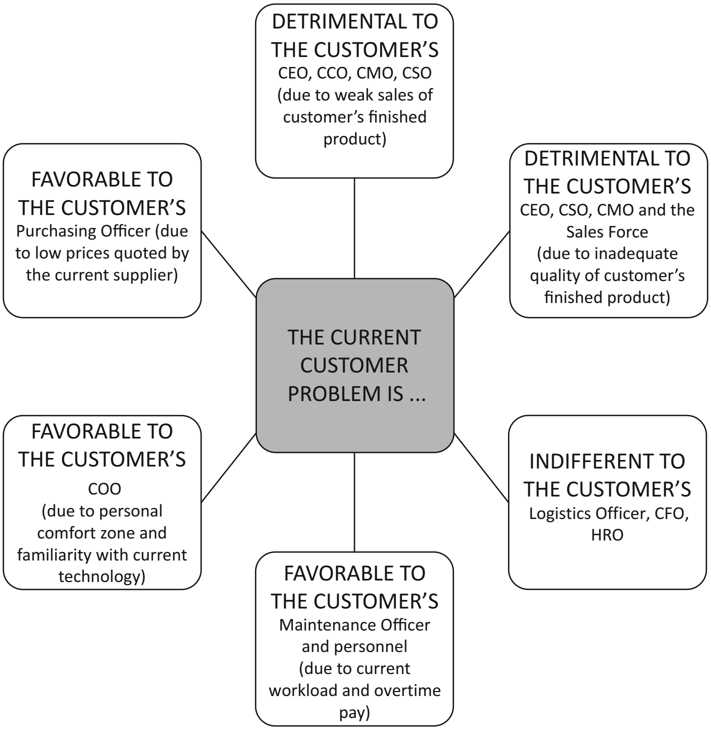


Fig. 8.3 This diagram is an example of how different professionals relate to a problem at their company. In this particular example, the problem is caused by an ingredient that is damaging the product's overall quality

should be able to detect these problems as they're forming and will already have helped design and develop suitable and competitive solutions. As such, this chapter assumes that these solutions have already been developed, and that now, it's the sales force's job to contact and visit new customers where they think the problem might be forming.

Naturally, if customers are already battling the problem, they'll have a greater sense of urgency than customers who are as yet unaware that it exists (here, the Sales Engineers will have to show these customers where and how the problem is forming). This is especially true of conservative or reactive customers who wait until a problem has reached a boiling point before making a decision.

Of course, if a customer is urgently looking to adopt a new solution, they'll already have contacted various suppliers. These suppliers may already have met with the customer, given presentations and demonstrations, or they may be planning on doing so.

As opposed to a criminal lawyer, who sells their services after the fact, an industrial Sales Engineer should plan on visiting customer facilities where the problem is forming. In order to determine which potential customers might experience this problem, a Sales Engineer needs to make inquiries and keep a lookout for detectable signs that the problem is forming (e.g. a Sales Engineer creates a protocol for identifying companies whose technology produces environmental acidity, which is corrosive to structures and equipment).

2. **The sales force and customer awareness of a problem**. In order to build awareness of a problem, the Sales Engineer needs to contact potential customers. When talking to customers, Sales Engineers should refer to the problem by name, provide practical examples of other related cases, and discuss what could happen if the customer doesn't attempt to solve the problem. Of course, when he/she introduces themselves, the Sales Engineer should also state what company they work for and the products their company has developed for solving these types of problems. The Sales Engineer can use audiovisual aids to show how the problem forms, the problem itself, and examples of other customers that have solved the problem by adopting the solution.

   This is also a good time to discuss performance metrics for important variables (time, costs, accidents, final quality, etc.). Throughout this discussion, the Sales Engineer should remain completely impartial about other alternative solutions to the problem, some of which may be completely legitimate. It's important that by the end of the meeting, the customer (or the customer's team) knows how much the problem will cost them when it presents itself (that is, if it hasn't done so already). It's also important to identify the problem by its name. In doing so, the name itself serves as a tool and helps prompt discussions about the issue within the customer's own organization.

3. **Define and measure the problem**. With help from expert suppliers, a customer can start to do their own research. This is an important opportunity for the Sales Engineer: oftentimes, the problem takes customers completely by surprise and, understandably, they'll want to evaluate other, alternative technological-solutions. There are certain activities that need to take place, such as: visiting the application where the problem is going to appear (if it hasn't done so already), collecting samples and data, interviewing personnel, taking measurements with specialized equipment, obtaining images, etc. There's as much variety in activities as there are different types of customer companies. As always, throughout this stage, the Sales Engineer needs to maintain a professional attitude.

   The Sales Engineer should help the customer define the problem as clearly as possible. They should use objective scientific methods to measure the effects of the problem. Anxiety over sales or manipulative behavior is strictly forbidden.

   The goal here is simple: assess the scope of the problem just as any independent professional would do. If a problem is relatively minor and there's no risk of it getting worse and becoming harmful, then the Sales Engineer should clearly explain this to the customer.

4. **Investigate the roots of the problem**. The Sales Engineer shouldn't be surprised if the cause of a problem is different from what they originally thought;

consequently this might rule out the engineer's solution. Each customer company is different and, even within the same industry, they'll each have different processes, facilities, and systems.

Sometimes, it turns out that what's causing a problem is easy to fix and is unrelated to the technology the Sales Engineer represents. If that happens, the Sales Engineer can go home satisfied, knowing they've provided a technical consultation service for the customer and that the customer will remember them for their professional attitude.

Above all, the purpose of this stage is to identify a problem's cause(s). A proactive Sales Engineer can write up a technical report and send it to whichever customer personnel are involved in the buying process.

5. **The sales force and understanding the causes behind a customer's problem**. A problem may be caused by human, environmental or technological factors that a customer is generally unfamiliar with. This is a good opportunity for a Sales Engineer to demonstrate his/her technical knowledge and experience with an issue. To that end, the Sales Engineer needs to be well-informed and up-to-date on the science(s) behind the cause.

   Yet, sometimes during this stage, the Sales Engineer isn't able to understand the cause either. In that case, they'll need to do their own independent research until they've found a good, reasonable explanation that they can teach to customers (this explanation should include sufficient technical detail). An industrial customer won't be happy about spending money on a solution if they don't fully understand the cause. This is all the more true if the problem is serious or very costly. This is the stage when a customer really starts to develop trust in the technical expertise of the supplier's sales force, especially if competitors haven't been able to understand or explain the science behind a problem's causes.

6. **The sales force and defining and quantifying the need**. When it comes to technical or economic issues, it's oftentimes very difficult to get rid of a problem's indirect causes. This is precisely why it's important to measure a problem. Later on, these measurements give companies a reference point for controlling a problem's cause(s).

   For example, a customer might be experiencing ongoing problems with a rolling bearing in their motors. The immediate cause might be that the bearings are exposed to too much heat. An example of a good 'needs statement' would be: "avoid unintended motor shutdowns". Then, it's the supplier's job to provide heat-resistant bearing technology. That way, the customer only has to do replacements when they intentionally halt production for general maintenance purposes.

   Getting a customer to provide a well-written needs statement is key; it allows a company to research and provide a competitive technological offer. Above all, this statement should include metric data showing how significant the problem and its solution are. In the above example, the Sales Engineer should find out how often the customer stops production for maintenance purposes; that way, he/she can assess which of their products would be able to withstand the customer's work conditions and maintenance cycles.

Another way of understanding a customer need is to figure out the maximum level of damage or harm (caused by the problem) that their business operations can withstand and still function properly.

7. **Sales force activities and their approach to researching different potential technological solutions**. The customer company will have personnel who are in charge of solving the problem; it's their responsibility to look for, study, and compare different technologies that will either eliminate the problem, or reduce its impact. A Sales Engineer that's representing a technological solution needs to understand that this is the customer's job; he/she shouldn't become defensive or anxious if a customer decides to evaluate other technologies. On the contrary, the Sales Engineer should know about these technologies, know which ones the customer is evaluating, and should be honest and straightforward when customers ask them for their opinion. As such, this stage primarily takes place within the customer company. So long as industrial marketers and R&D personnel have done their job properly, then a company's technology should be able to compete and win against other technologies for a particular target application. When a customer's engineers research different technologies, they'll generally begin by getting information from associations, consulting with engineering firms, learning about cases described on the Internet, referring to opinion leaders, academics, etc. Because of this, a Sales Engineer should make sure that their company's promotional and informational personnel have reached out to these sources, and done their best to favorably position their technology and brand.
8. **Evaluation and comparison of potential technological solutions**. If industrial marketing strategists have done their job properly, then their potential customers will already have been identified as target customers. As a result, a company's technology should be one of the best technologies out there for resolving the customer's specific problem.

   But, in the majority of cases, it's not the only one. The customer will have contacted suppliers from different industries to discuss the characteristics of their technological-solutions and the potential price. Not to mention, there's bound to be several competent suppliers for each type of technology, all of whom will want to demonstrate the benefits their product or service provides. For the initial comparative stage, a customer might begin by assessing different types of technologies. The Sales Engineer should expect that, so long as customers are doing their job properly, they'll want to know and confirm the practical benefits that each technology provides for solving their problem, as well as the costs involved. Also, the customer will want to know about other cases in which the technology has been used successfully and unsuccessfully. Sometimes, customer personnel will travel to remote areas in order to see the technology in real action. A product's technical performance is closely tied to the costs and financial benefits it provides.

   Most of the time, customers will want to see these benefits expressed in monetary terms. Once a customer has decided which type of technology they're going to use, the Sales Engineer should be prepared to compare their offering to those of direct competitors. 'Being prepared' means that the company will already have done a side-by-side technical comparison between their product and those of their strongest competitors, taking into account a customer's real-life usage conditions. The metric findings from this comparison should be expressed as economic performance benefits to customers.

In order to carry out these comparisons objectively, customers can contract an independent certifier. Additionally, once the Sales Engineer knows the size of the project, he/she should be able to demonstrate that their company has the installed capacity, logistics organization, and after-sales channels and services to support the customer throughout the offering's service life.

It is of paramount importance that the Sales Engineer be certain of what can be promised or committed to the customer. Here it is very convenient to have a fast-track communication line with operations and logistics (and whoever else in involved in delivering the offer).

Of course, a supplier can invite a customer to visit its production facilities. That way, the customer can familiarize themselves with the supplier's facilities, personnel, processes and administration.

9. **The Sales Engineer's role during the customer's technology/supplier selection process**. Technical specifications provide a clear opportunity for Sales Engineers to sway the selection process in their favor. Naturally, if a product is superior or more well-suited to a specific application, it's probably because it has certain design and performance characteristics that set it apart from its direct competitors. The Sales Engineer can make sure that these differences are explicitly included in the design specifications. Sometimes, technical specifications require a product to comply with certain standards and this alone is enough to rule out certain suppliers. Other times, technical specifications might reference a particular regulatory standard that is more explicit about what's minimally required of the product or service. If there aren't any regulatory standards in place, then the technical specifications should include detailed information about the product/service's design and benefits.
10. **A Sales Engineer's role during the final stage of the business deal**. Depending on how formal the customer-supplier relationship is, a Sales Engineer may or may not know whether theirs is the preferred technology. Of course, judging from the content and frequency of customers' questions, more experienced Sales Engineers will already have a good idea as to whether or not they're among the finalists.

    This type of guarded professional behavior has a lot to do with cultural norms, and it can help a customer secure last-minute price discounts. In less formal situations, where a supplier has already provided a reference price and the commercial terms for the product, a customer might be more open about whether they prefer the supplier's technology. In some business cultures, customers take the initial price quote as something fixed and definitive, and they don't negotiate additional discounts. Other times, however, the custom is to always 'inflate' the price so that it can be negotiated and lowered later on.

The Sales Engineer needs to be prepared to deal with last-minute price negotiations. During these negotiations, the initial price quote should never be thought of as 'inflated'. If prices are lowered more than 10 %, there needs to be a better reason than simply "lower margins in order to secure a sale." These reasons might have to do with changes in the design, materials, importation costs, increased purchase volume, etc. This volume won't go into detail on cultural approaches to negotiation or negotiation techniques.

Once the purchase order is in, a professional, proactive Sales Engineer knows that there's still a lot of work to be done. In today's world, a sales professional can't just walk away as soon as a sale goes through, and leave production and logistics personnel to do the rest of the work. Even though the Sales Engineer will have just finished coordinating an entire multidisciplinary team to get the sale, it's still their name and their word that customers are going to associate with the product promise.

The Sales Engineer's Role in After-Sales Management

In order to discuss an industrial Sales Engineer's role in after-sales services, it's necessary to look at the following two types of situations:

After-Sales Services Implemented by the Sales Engineer

In this case, after-sales services are about making sure that an offering fulfills its promise to customers over time. The *raison d'être* of these after-sales services is to *guarantee* product/service performance. As such, a supplier's Sales Engineers and/or technical personnel provide certain after-purchase services to the customer free of charge: measurements, consultations, training, supervision, feedback, reports, etc. From here on out, these can be referred to as Protective After-sales Services (PAS).

The Sales Engineer is directly responsible for correctly managing PAS. If more than one Sales Engineer has been working with a customer, then the coordinator (e.g. application manager or sales director) is responsible for keeping everyone organized and making sure that each engineer implements his/her own PAS protocols.

In the interest of preventing any conflicts between sales management and after-sales commitments, it's important take a moment to discuss and dispel certain myths about after-sales services:

Myth N°1. "The only way for after-sales activities to be profitable is to charge customers money." This myth is frequently voiced by short-term thinkers. It's true that in the short-term, after-sales activities would appear to hurt a company's bottom-line. And, in the short-term, perhaps they do. However, if people want to build long-term relationships with customers, learn to properly segment their applications and design better and more robust products, then they know that the positive cycle shown in Fig. 8.5 is a way to build *momentum*, allowing a company to offer better and better products/services over time and gain competitive advantage. Soon enough, a proactive supplier will realize that customers prefer going to them for new projects or sales.

Myth Nº2. "After-sales is the enemy of sales: each hour spent on after-sales, means one hour less for sales, and one hour more of costs." Naturally, this myth is widely upheld by manufacturers or dealers with an intense sales culture, one that interprets 'sales management' to mean getting one purchase order and then immediately turning around to go look for another. However, industrial manufacturers that value solving customers' problems and benefiting customers through what they do find it preposterous to say that PAS is a waste of time or is unprofitable. When suppliers reject myth Nº1, they will soon reap the rewards of their customers' appreciation. Likewise, when suppliers reject myth Nº2, they'll soon find that customers are more welcoming toward their sales force and provide the sales force with better information.

Myth Nº3. "If there's no fee for the hours of work that Sales Engineers do, then after-sales services are just a *favor* that a company does for its customer." People who believe this myth usually consider their customer as an adversary. As a result, when the Sales Engineer performs activities and services, the company acts as if it were 'doing the customer a favor'. This can give the supplier providing PAS an unprofessional and arrogant attitude. PAS needs to be taken just as seriously, with as much commitment and attention to detail as when a Sales Engineer first starts working with a new customer. And, it needs to be done regardless of a customer's purchasing behavior or negotiation culture. Products, sales, and after-sales—these are things that manufacturers and dealers should be proud of. They shouldn't be used as rewards for good customers or as strategies for locking-in large-volume ones.

In fragmented markets, not all customers will be able to receive in-person PAS (with visits from the Sales Engineer). Nevertheless, a proactive supplier needs to realize that it's good business culture to see PAS as an extension of their overall offer. This supplier should divide their fragmented users into coherent groups and, either directly or indirectly, communicate with these groups about them how to take care of their investment.

The Sales Engineer and their company need to understand that there are a few basic requirements that are absolutely essential for proper PAS:

– It should follow a formal procedure. This procedure will have previously been discussed with the customer receiving PAS.
– It should be done diligently and periodically.
– The program should last a minimum amount of time in order to ensure the desired effects (e.g. 2 years per customer).
– The supplier needs to see PAS as an investment.

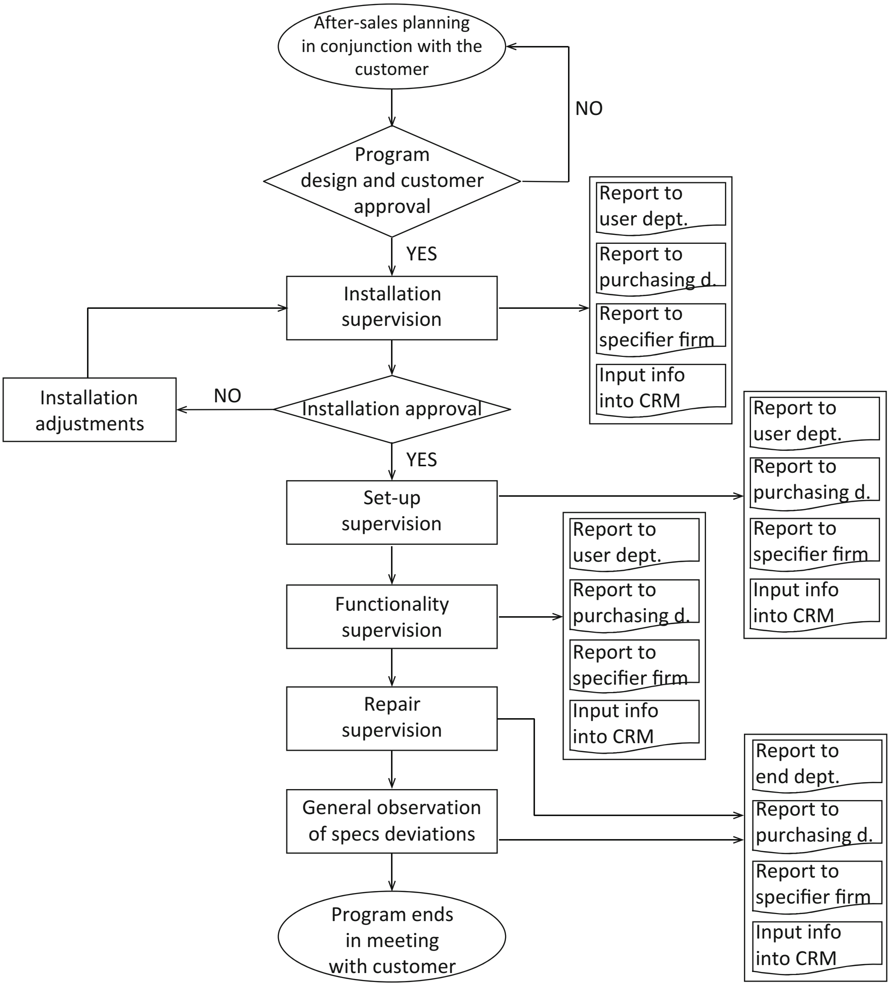


Fig. 8.4 Example of a flow chart for a PAS program. During the first step of the process, both supplier and customer plan and design the program. Next, the program is implemented. Reports should be prepared for each of these stages: supervision and inspection of product assembly, supervision and inspection of product set-up, measuring and controlling for functionality, supervision of scheduled maintenance, and general observation of anomalies. In order for these activities to be done correctly, there should be a formal procedure for each

– The Sales Engineer needs to maintain a professional, meticulous, and open-minded attitude.
– PAS should have its own budget, organization, and information system.

The flow chart in Fig. 8.4 is an example of a formal procedure for PAS. Note that this requires four different reports at once: one for the end-user, one for the purchasing department, another for the project specifier and, no less important, inputting information into the company's own systems through, for instance, a CRM system (customer relationship management).

There are several advantages to understanding and implementing after-sales in this way, including:

– It gives feedback to the company, allowing the company to design and develop better products from the original offering. Through the Sales Engineer's fieldwork, a company systematically learns about any factors that cause a product to be less robust or less well-suited to an application.
– The feedback that it provides allows a company to develop more specialized products for particular market applications. Given their mutual emphasis on product attributes (*performance enhancing*, *self-protection*, *usability*, *attributes in case of externalities or anomalies, see Chap. 3*), a Sales Engineer's fieldwork and the Discovery Team's work both complement one another. The supplier should really take the time to consider this feedback, as it allows them to consistently adapt and specialize their product design.
– It improves a company's professional standing. According to this author's research, when suppliers behave selflessly and are committed to their customers, customers notice (this might be a tacit awareness, or they may be vocal about it). In today's world, industrial customers are pleasantly surprised when a supplier approaches them and offers to provide a benefit that doesn't immediately result in a purchase order.
– It lowers the perceived risk felt by users and specifiers that are considering purchasing the supplier's technology. Given that a proactive supplier is concerned about developing products that require less maintenance and have fewer breakdowns, and given that their after-sales services are designed to serve as a product/service guarantee, customers and specifiers will be more willing to use a supplier's products in the future.

Thus, PAS creates a positive cycle. This is shown in Fig. 8.5.

After-Sales Services Used as a Profit Center

In this case, the manufacturer or dealers provide services such as specialized maintenance or repair work to a product during its service life. These services are described to customers in detail and customers are charged the market price for them. A supplier can also sell material items (e.g. repair parts); however, a well-intentioned industrial manufacturer will make sure that this doesn't become the focal point of their business.

This kind of after-sales support, which is centered around replacement parts and skilled labor services, may be necessary for several reasons:

– A significant amount of industrial products and services are used in aggressive environments, 24 h a day, 7 days a week. Even if the product is made with good quality or high-tech materials, with this kind of rhythm and working conditions

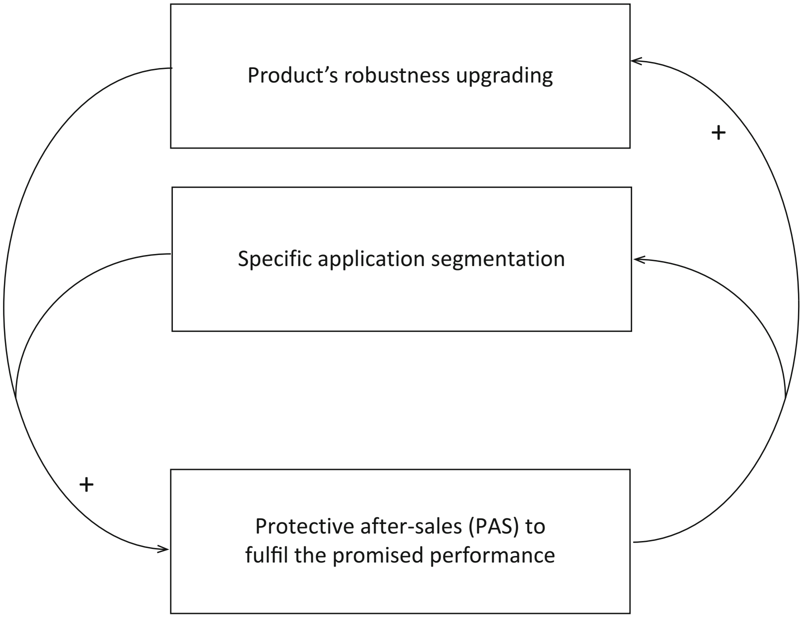


Fig. 8.5 Protective after-sales services (PAS) create a positive cycle. A supplier can design, offer, and implement an after-sales program that guarantees product/service performance. When they do, they'll receive important feedback that helps them design more robust products that require less maintenance and have less breakdowns. This type of after-sale program is a good opportunity for manufacturers and dealers; it allows them to learn about the product in use and its application, and provide feedback to R+D about a particular application. Likewise, once a manufacturer starts producing better, more robust products, they'll be inspired to continue implementing PAS. And, over time, PAS becomes increasingly straightforward and inexpensive

it's inevitable that materials and coatings will wear out or get contaminated, or lubricants will start to degrade, to name just a few examples.

– Some of these products or services are central to a customer's operations. Unexpected breakages could bring the entire production line to a halt.
– When products are properly maintained and repaired (especially mobile machinery), this keeps them from sharply depreciating over time. As evidenced by numerous product lines, this prevents the price of the new product from going down. Figure 8.6 shows this virtuous cycle in which proper after-sales services affect the initial price of a product.

One of the biggest obstacles that can affect after-sales support is the physical distance between a supplier and a user. If this becomes an issue, then the manufacturer can delegate after-sales support to a separate office with company personnel (abranch office), or to a specialized distributor that functions as a dealer, or to local contractors. Inevitably, when there's a large number of products, equipment, and machinery, it's necessary for skilled workers and replacement parts to be in close proximity to end-users. This reduces the amount of downtime caused by maintenance or repairs.

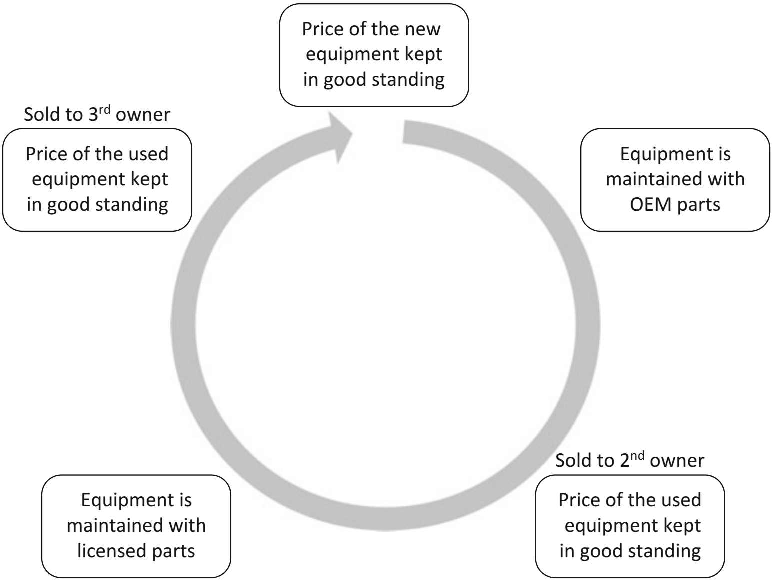


Fig. 8.6 A virtuous cycle in which proper after-sales support keeps industrial equipment from depreciating in value, and this, in turn, bolsters the product's initial price. A manufacturer should have a plan for short-term and long-term after-sales, even if another company is responsible for implementing and charging for after-sales services

Different manufacturers opt for different distribution and dealership models in order to provide effective after-sales support. For decades, the American company, Caterpillar, has relied on Finning as their largest global dealer. This model is based on agreements with financially stable distributors; here, distributors receive intense, ongoing technical training on products and repair and maintenance procedures. Caterpillar's long-established competitor, a Japanese firm called Komatsu, has opted for a stronger local presence in certain markets (with its own offices and technical sales personnel) and it delegates more intense services to various medium-sized distributors that have close, long-standing ties to user-clients.

For a more detailed look at different types of industrial distribution, the reader can refer to Chap. 9 of this book.

When Companies Misunderstand After-Sales: Doing Business Behind the Customer's Back

Towards the end of the twentieth century, when the software and hardware for information technology, PCs, smartphones, tablets, and other similar products really started to take off, the concept of 'planned obsolescence' emerged. At business schools, professors and students applauded this model and its underlying purpose: the new paradigm required people to be *astute*. Thus, products or services that still had several years of service life left in them would suddenly and automatically become obsolete due to new products that weren't necessarily any better. This guaranteed sales growth for the entire industry.

Unfortunately, the industrial world was also affected by this paradigm. It's easy to find senior executives at industrial companies who are frantically looking for new, easy, and short-term ways to increase sales. These executives know that users generally reject and react negatively to planned obsolescence (remember that in an industrial context, the customer can be thought of as a colleague). So, as a result, these executives often rely on salable after-sales services.

By turning it into their primary business, these companies misrepresent the spirit of after-sales. This kind of supplier sees after-sales as a direct opportunity to fatten their bottom-line. In some real-life cases, where a company's profit sources are analyzed separately, it turns out that after-sales is what's most profitable. The supplier continues to use the term 'after-sales' to refer to services that are mandatory by design and that the supplier charges their customers for. For managers that understand after-sales this way, the product's performance and service life are just another means for selling services and replacement parts. Over time, this type of after-sales model tends to grow and, eventually, the supplier ends up servicing products from different companies.

Sadly, this type of after-sales causes companies to try to hold on to customers, promote relatively generic products, rely on old product designs, and be more removed from their users. This mentality and approach to after-sales comes from one of two places: (a) an interest in developing new cash flows for a company, which is due to a high pressure culture that emphasizes overall business profitability, and (b) products that have become commoditized (or that the supplier themselves has unintentionally commoditized).

Combining a profitable after-sales program with a commoditized product can create a mutually-reinforcing vicious cycle. This is shown in Fig. 8.7.

Arguably, this perverse form of after-sales is at its worst when suppliers aren't upfront with customers during the sales process about how costly after-sales services will be.

Sometimes, a well-intentioned but naïve manufacturer can end up in a similar situation by contracting an exclusive dealer with monopoly power within its zone of influence. Needless to say, given industrial customers' increasing technical and business sophistication, these kinds of tactics will only lead customers to reject the supplier for a long time to come.

Consultative Sales Management for Capital Industrial Projects (Capex)

This chapter has focused on the iterative consultative sales process between customers and suppliers. Thus far, this discussion applies to standardized products or specially requested ones, with little distinction between the two.

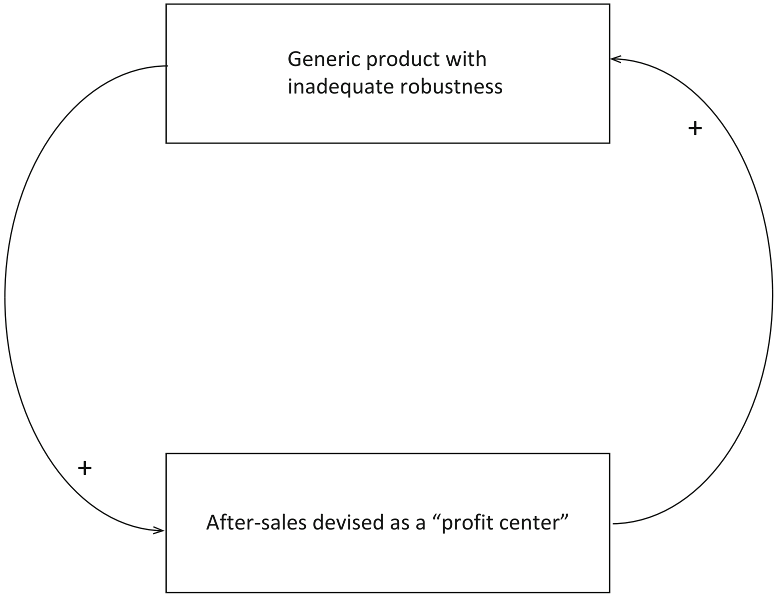


Fig. 8.7 When manufacturers or dealers rely on their after-sales program as a major profit center, they’re unlikely to engage in new development projects to design more robust products for each application. Managers at the manufacturing company can easily become fixated on this new source of income. They would just as soon let other companies have the competitive advantage of providing the best product

What follows is a discussion of the processes and procedures in consultative selling. This discussion is meant for manufacturers that are interested in becoming suppliers for industrial infrastructure projects (also known as ‘capital expenditure projects’, or Capex. For Opex-type projects please see further below).

Capex projects are financed through either public or private investment and they create functional infrastructure that benefits the investor and the investor’s customers over a relatively long period of time. There’s a great deal of variation between different types of Capex projects. Differences include: the nature of the products required from the supplier (whether it’s a mass produced product, or a made-to-order product), the length of the contract (ranging from one purchase to several purchases over a few years), the structure of the purchasing chain (direct purchasing, turnkey, turnkey-plus, EPCM, etc.), and the complexity of the purchasing process (from direct sales to bidding).

Figure 8.8 shows the different stages of a typical large-scale Capex project. While they may seem similar, it’s important not to confuse the purchasing process shown in Fig. 8.1 with the different stages of a Capex project. The purchasing process is simpler and only accounts for *one* product or *one* service. The stages of a Capex project are a multidisciplinary endeavor and they often require several companies working together to plan, design, purchase, and build the infrastructure.

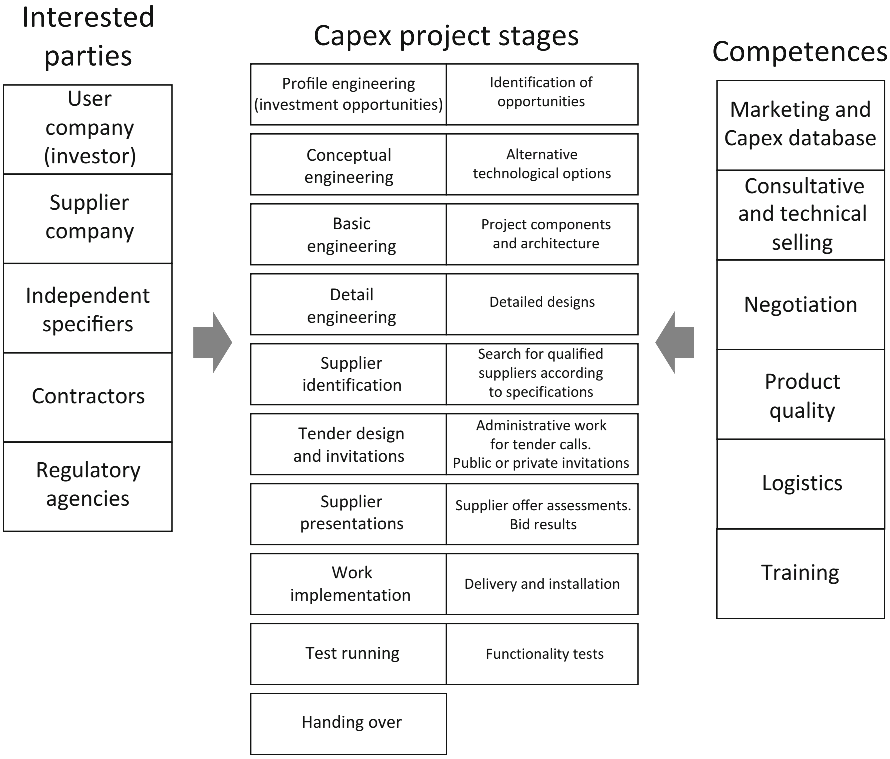


Fig. 8.8 The stages of a typical Capex project (*center*), shown together with the interested parties (*left*), and the required supplier competencies (*right*). Depending on the complexity of the project, its technologies, participants, financing and interested parties, this process could last as little as a few months or as long as several years. *Source*: *Adapted from Project Marketing, Beyond Competitive Bidding. Bernard Cova, Pervez Ghauri and Robert Salle. John Wiley & Sons Ltd. 2002*

Depending on how the project is set up, some stages might fuse together (profile engineering with conceptual engineering) while others, may run parallel to one another (identification of suppliers and conceptual and basic engineering). Each of these stages requires specialized personnel; as a result, it's not uncommon for each stage to be assigned to a different company that specializes in a particular line of work. For instance, there could be three different engineering firms responsible for, respectively, a project's conceptual, basic, and detailed engineering.

If an industrial company is interested in supplying products for a particular Capex project, they should determine their supply chain structure (also referred to in this book as the industrial chain) from manufacturer to end-user. For large-scale Capex projects, the supply chain might have to be organized and arranged differently. It all depends on whoever is leading the project (the investor) and their desire to simplify the process.

For instance, in a more simple case, the company investing in the project might decide to take on all supply management duties. In other instances, where a project is bigger and more complex, this company might hire a large contractor to buy and install supplies, delegate engineering and construction to a third firm (turnkey project), or even delegate all of the supply and construction stages, as well as operations and maintenance, to other companies (turnkey-plus project, or EPCM, engineering, procurement, construction, maintenance).

Complex Markets

Earlier, this chapter discussed the importance of studying and understanding the various stages of a Capex project along with the structure of its supply chain.

At this point, it's good to take a look at the various actors, or players, that participate in decision-making or that influence a project's characteristics (and, by extension, the technologies that are bought and used).

Who these actors are, or how complex their involvement is, largely depends on how big of a socioeconomic impact a Capex project will have, as well as how much of an investment the project represents. See Fig. 8.9.

Sometimes, either because of its functionality or its cost, a supplier's technology is an essential part of a project (e.g. the trains for an underground urban transportation project). In these situations, the supplier's upper management, marketing

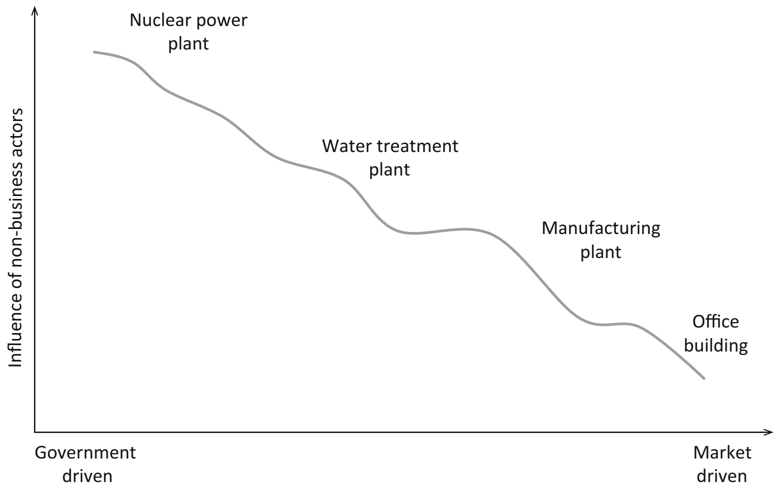


Fig. 8.9 The influence of non-market actors (including regulators, politicians, special interest groups, etc.) depends on the nature and size of a project. At one extreme, a project might be financed and lead by government agencies; at the other, a project might be a private sector initiative (notwithstanding, companies still have to comply with regulatory standards). *Source*: *Project Marketing, Beyond Competitive Bidding. Bernard Cova, Pervez Ghauri and Robert Salle. John Wiley & Sons Ltd. 2002*

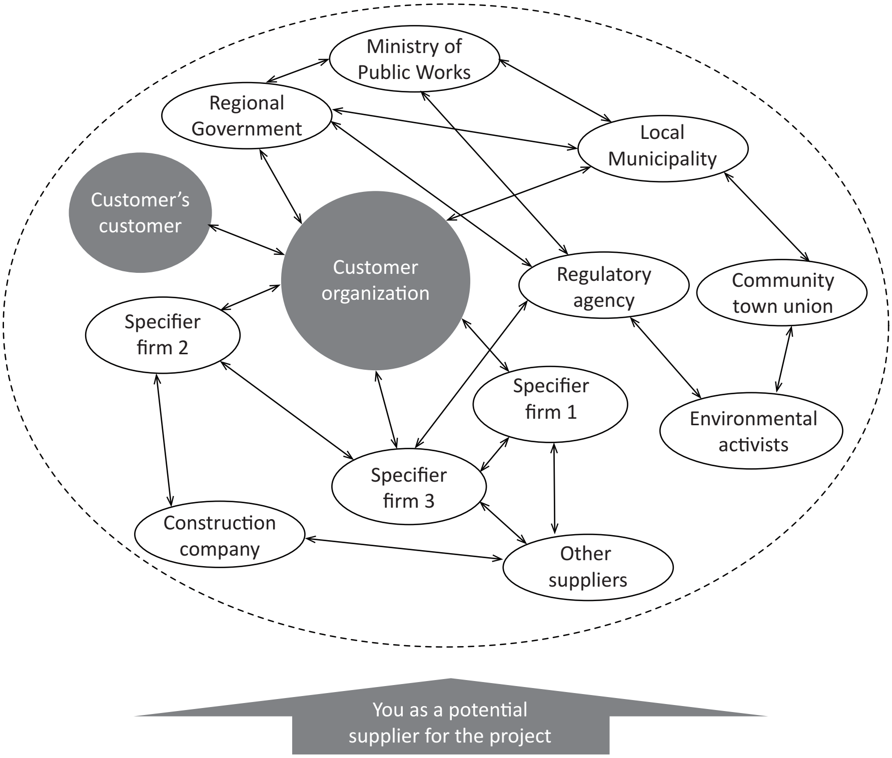


Fig. 8.10 A map of external players. This shows different actors in the marketplace that influence the viability, development, and implementation of a large-scale infrastructure project. When promoting their offering, a potential industrial supplier (*bottom arrow*) needs to consider all of the market players shown in this map; this includes institutional players (government or public agencies) as well as private sector players (engineering specifiers, construction companies, contractors, among others). The company financing the project, as well as its customers, are shown in *black circles*. This map doesn't take into account the presence of competitors or substitutes. The *arrows* represent different inter-organizational relationships that are necessary for working on the project

personnel, and sales force need to consider a much wider pool of market actors (seeFig. 8.10), much more so than suppliers whose products are only indirectly involved in the overall functionality or total cost of the project.

For example, a hydroelectric project that requires building a reservoir and a dam will have to interact which institutional actors have a say in the project's viability.

The smaller these projects are, or the less socioeconomic impact they have, the simpler this map becomes. At its most simple, the customer company is the only actor that a company needs to pay attention to when selling products and services. Even this, however, is no easy task. Companies have their own internal actors that can affect project design and implementation in different ways. Thus, the sales force should create a map of the different internal players at a potential customer's company. Figure 8.11 provides a simplified version of this map.

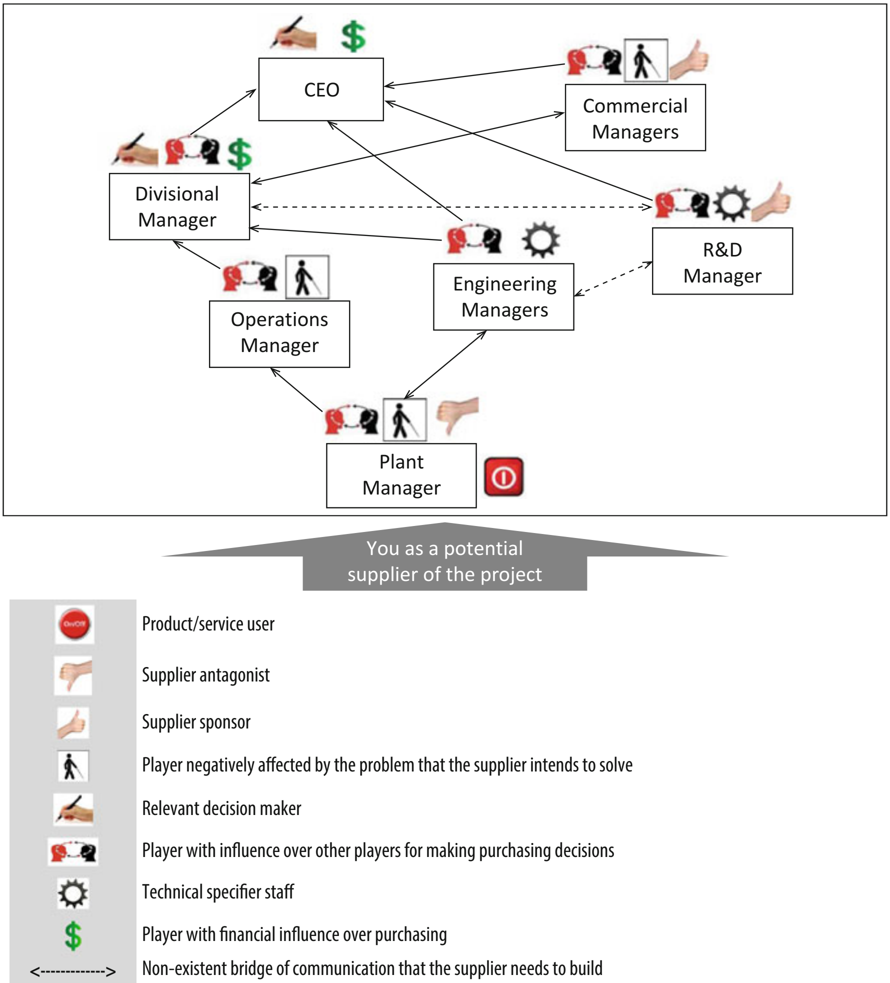


Fig. 8.11 *A map of internal players*. This shows various internal actors within a customer company that is currently developing a project. Several of these players (managers, executives, operators) have multiple responsibilities in developing an internal project. These players have to coordinate with one another, fulfill their own responsibilities, and they may influence one another's decision-making. Also, they might influence the technologies or suppliers that their company uses. A supplier can use these symbols as a way to identify each player's role; this helps a supplier determine the amount and type work they should do with each internal actor. It's the sales force's responsibility to create a *map of internal players*. The symbols are explained separately

These symbols represent different roles in project development. They are also used to indicate how different actors perceive the potential supplier.

The structure, extensiveness, and complexity of this map affects how the sales force plans its activities and mobilizes other company personnel to iterate with customers and discuss the advantages of their offering. When planning promotional activities, it's important to remember that these influential players won't necessarily be working together or even at the same time. As shown above, a project goes through several different stages at different times. The sales force should create a work schedule for these stages.

Consultative Sales Force Activities That Take Place During The Project Development

Having looked at the process that capital projects typically go through and the potentially complex web of actors that are involved (both at the market level, as well as within the customer company), it's time to discuss sales force activities from the point of view of the potential supplier.

Detection and Identification of Capex Projects

The nature of the market (be it a large country, a region, a geographic area, etc.) affects how a company detects and identifies Capex projects that might require one of its products or services. In some parts of the world, there are specialized firms that compile information and characterize different capital projects that are still in their early stages. These firms produce sophisticated databases and reports so that interested suppliers can study them and use the information to make decisions. Some examples of this type of company are Meed (which specializes in the Middle East and Northern Africa), PECWeb (as of today, it has global databases for 12 different industries) or CBC (which gathers information on any Chilean project exceeding 1 million dollars).

Much of the information in these databases comes from investors' activities at the beginning of a project; that is, from their meetings with official agencies to obtain the legal permits they'll need to develop the project, implement it, and get it into operation. When there aren't any databases and reports for the market that a company is interested in, then the supplier will have to plan and execute their own research activities. In which case, there are several different sources of information that a company can turn to: current customers, opinion leaders, engineering offices, statement of intent (communicated either through the press, or through the Internet), other suppliers (ones that aren't competing with the company), contractors, intermediaries, etc.

Companies often find out about new projects both through networking and the regular and periodic work of their Sales Engineers. The Sales Manager should make sure that the sales force starts working on projects in a timely fashion; that is, before the product/service's technical specifications begin to be formulated. This is when consultative selling proves itself to be much more proactive than transactional selling. These two types of sales are shown and compared in Fig. 8.12.

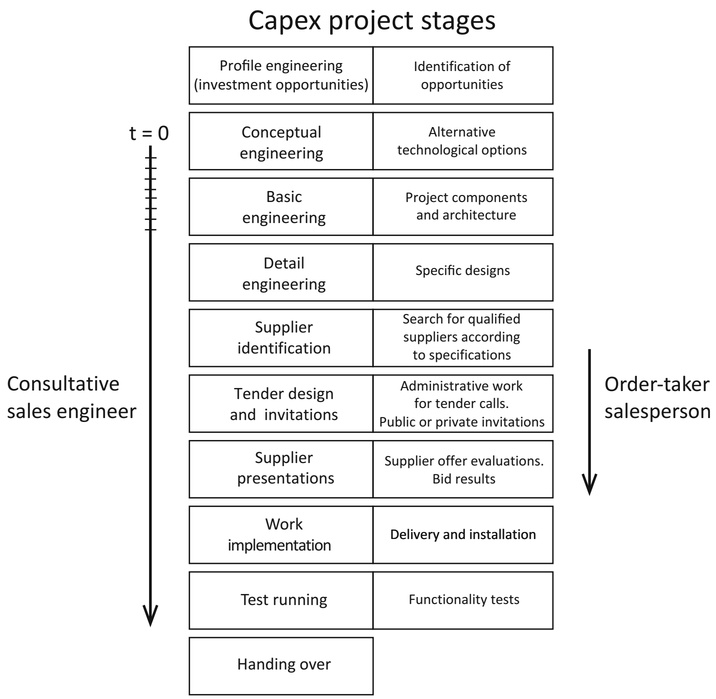


Fig. 8.12 In consultative selling, a company detects, identifies, and begins working on customer Capex/Opex projects early on, as soon as it becomes clear which technology the specifier needs to address (*left arrow*). Conversely, a reactive salesperson waits to receive a customer's request for proposal (*right arrow*) before getting started on a project

Assessment and Selection of Capex Projects

Once a company has obtained or created a database of Capex projects within a predefined zone of influence, the next step is for the sales force to assess each project. The sales force needs to determine how attractive each project is, and what their company's strengths are for working on the different stages of the project. The projects that a sales force chooses should be directly related to a company's target applications (which were identified during the market segmentation program). Thus, the company can use the database to identify a subset of projects of interest.

Based on the various projects' characteristics (size, volume, assembly conditions, etc.), it shouldn't be difficult for the sales force and industrial marketing personnel to figure out the potential sales volume for their company's product(s). This helps a company decide which projects to work on based on their own production capacity. Once they've identified projects of interest, the sales force should create a map of external players (Fig. 8.10) and/or a map of internal players at the customer company (Fig. 8.11).

Creation of a Project Map

Identifying projects of interest allows the sales force to create an extremely useful tool—this tool is central to coordinating consultative selling and it helps the rest of a company plan different other activities. The project map shows the various Capex projects and their progression over time. Figure 8.13 provides an example of a project map.

A company should try to schedule each of these stages as accurately as possible. This book recommends that the stage where a Sales Engineer first becomes active (e.g. conceptual engineering, basic engineering or detailing engineering) should be highlighted in green (similar to a traffic signal). The stages that are highlighted in yellow mean that the Sales Engineer is still able to influence the project specifications, but their chance of success is much lower than in the green stages. Once the project advances into the red stages, it's too late for the Sales Engineer to be proactive. On the whole, if a sales representative doesn't start working until they receive a customer's request for proposal, it's very likely that other, more proactive suppliers will have already have begun working with the customer in order to determine the best solution.

The kind of suppliers that prefer to save time by not consulting with customers during the early stages of a project are the kind of suppliers that think of their products as commodities. Their tactic is to try to win purchase orders by offering lower prices.

The project map is meant to help coordinate and manage Sales Engineers, although Sales Managers shouldn't think of it as a control panel. What managers will find, however, is that they benefit considerably from the organization and feedback this map provides.

In fact, given the map's ability to relay information on potential future sales, it can end up having a significant impact on other company activities. Figure 8.14 shows how this map benefits other areas within the company.

The Importance of the Project Map for Production Planning

One of the most difficult tasks in operations management is figuring out the amount of resources a company needs to plan for production. This is a multidisciplinary task as it involves things such as: scheduling production shifts, determining the type and amount of supplies, materials, and machinery, and prioritizing which product to manufacture, to give just a few examples. As a result, a well-designed and detailed project map gives a company an approximate idea of when it will be receiving purchase orders, for what amount, and the type of product or service mix that's required.

The Importance of the Project Map for Financial Planning

A well-designed project map allows the finance department to predict how much working capital the company will need for future projects (e.g. opening credit lines to customers and purchasing materials from suppliers). As a result, it allows a

Project ID N°	Name of project	Name of investor company	Expected purchase volume	Expected purchase sales	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month n
Project 1	Altenfeld-Redwitz	A GmbH	X units	€ 130X		Concept/Basic Eng.		Detailing Eng.		Tender	Construction				
Project 2	Altheim-Matzenhof (St. Peter)	B GmbH	Y units	€ 120Y	Concept/Basic Eng.		Detailing Eng.		Tender	Construction					
Project 3	Audorf-Flensburg	C GmbH	W units	€ 125W						Concept/Basic Eng.		Detailing Eng.		Tender	Construction
Project 4	Audorf-Hamburg/Nord	D GmbH	Z units	€ 155X				Concept/Basic Eng.		Detailing Eng.		Tender	Construction		
Project 5	Audorf-Kiel	E GmbH	K units	€ 100K			Concept/Basic Eng.		Detailing Eng.	Tender	Construction				
Project 6	Dörpen West-Niederrhein	F GmbH	J units	€ 105J							Concept/Basic Eng.		Detailing Eng.	Tender	Construction
Project 7	Emden-Conneforde	G GmbH	R units	€ 110G	Concept/Basic Eng.		Detailing Eng.		Tender	Construction					
Project 8	Ganderkesee-St. Hülfe	H GmbH	h units	€ 120H								Concept/Basic Eng.		Detailing Eng.	Tender
Project n	Etc.	Etc. GmbH	Etc.	Etc.											

Signal colors for sales activities

- Concept and/or basic engineering phase
- Detailing engineering phase
- Pre-tender and tender process
- Construction phase

Fig. 8.13 The project map should list the projects of interest in each Sales Engineer portfolio, the investor companies, and the expected sales volume (this is based on past sales information) The map should provide a timetable with the start and end dates for the different stages in each project, including: the conceptual engineering stage, basic engineering stage, detailed engineering stage, the request for proposal process, bidding, and the start and end dates of project construction and implementation. The sales force's activities during each stage, as well as the colors used in this map, are both discussed in the main text

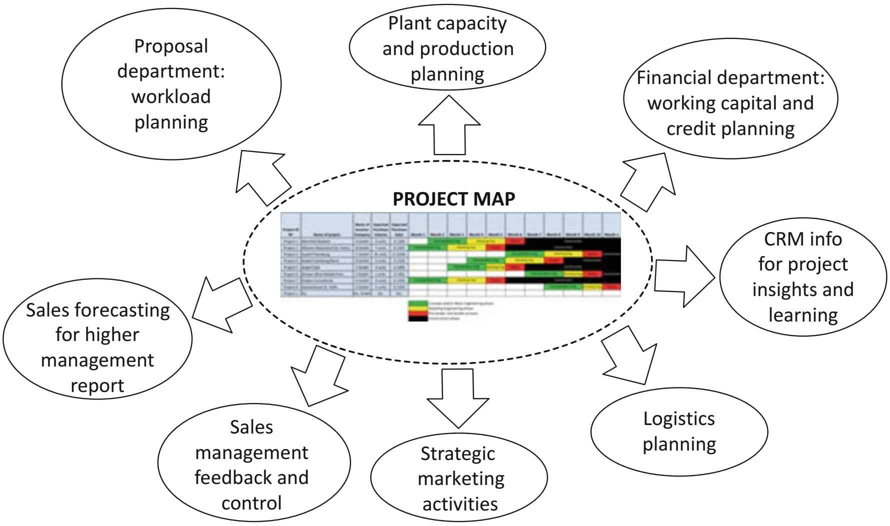


Fig. 8.14 This diagram shows how a well-designed project map affects other departmental activities at an industrial supplier company. The more precise the information in the map is, the greater its impact on a range of different disciplines within the company. This is because the project map helps predict future sales, and this, in turn, allows the marketing and sales department to take a leading role in a company's operational planning

company to be much more precise about its cash flow and it can save a company a significant amount of money (for example, it helps a company choose the right banking options).

The Importance of the Project Map for Logistics Planning

Depending on a company's logistics processes, if they're able to anticipate future sales, volumes, and the product mix, this will help them schedule things such as purchases, packaging, necessary materials, stock, and transportation. Once again, not only does a company benefit by saving money, but they also provide better service to customers.

The Importance of the Project Map for the Proposal Department

For a lot of industrial companies that produce and sell to Capex projects, one of their most significant bottlenecks has to do with the availability of their Proposal Department to study and prepare proposals for customers. By analyzing the sales force's project map, the head of the department can determine and anticipate how much installed capacity is required, and what kind of professional characteristics their department needs to have in order to prepare the requested proposal.

The Importance of the Project Map for Managing a Company's Industrial Marketing

Each new project or contract is an opportunity for a company to deepen its understanding of the buying/selling process, the assembly/integration process, and product usage. A new project means new circumstances, a new environment, and new technologies. There are several different things that need to be on a company's 'marketing radar' in order to learn about these projects ahead of time. Additionally, industrial marketing personnel need to consider things such as: project duration, the life cycle of their products, the potential for products to go obsolete, as well as ongoing product support, such as distribution, services, and replacement parts.

The Importance of the Project Map for Providing Activity Forecasts to Senior Management

As the reader will have realized, the project map can be used as a sales forecasting tool and, to some degree, it also helps a company plan the rest of its activities. Senior managers should know what their company's sales forecast looks like—either because they need to discuss it with the board of directors and compare it to their current sales commitments, or to adjust the operating budget, or, potentially, to make any necessary investments that allow the company to achieve its goals. Proactive senior managers make sure that the right conditions are in place for benefiting customers as much as possible during their project's development and operation. Conversely, for reactive managers, the sales forecast is simply a 'nice to know' tool.

The Importance of the Project Map for Providing Informational Feedback to a Company's Databases

Companies are always learning new things about their own business, and about the businesses of their customers and suppliers. As a part of this, Sales Engineers need to add information to their company's databases (using information technology, for instance) about what has occurred at each stage in a Capex project development. A company experiences successes and failures, and it will eventually gain a better understanding of how professional customers behave during a project, as well as any behavioral trends. Even though project stages generally follow the same basic logic, their underlying structure and buying and supply systems are constantly changing. All of this information becomes part of a company's 'organizational memory' which helps the company improve its sales processes and its chances of success in future Capex projects. Naturally, companies need to process and understand these databases. This will be discussed further on in this chapter.

The Importance of the Project Map for Managing and Overseeing the Sales Force

Typically, when salespeople talk to their leaders or managers about goings-on in the market or with customers, they tend to use language infused with a lot of wishful thinking, or an optimistic and 'nice to know' mentality. For instance: "project xyz for customer zxl is running behind schedule, but I think our new product has very good prospects." Not only is this an imprecise way of communicating, but it's also true that neither the Sales Engineer nor the manager is capable of mentally retaining all of the target projects at once. The usefulness of this tool is evidenced in one-on-one meetings between the Sales Manager and a particular Sales Engineer, as well as in group meetings. The project map can really be used as a checklist of sales activities and sales force commitments. It allows the Sales Manager to detect any weak spots in sales activities and to systematically assign more resources, time, and dedication to those areas. Not to mention, the project map makes it possible to design in situ sales plans, reassign tasks, and organize work-teams. Also, having a project map for the entire year allows a Sales Manager to develop more precise and fact-based sales quotas for their sales force, rather than arbitrarily assign sales objectives.

The Importance of the Project Map for Other Areas Within the Supplier Company

Albeit indirectly, the project map, which is used to predict opportunities for future sales, also affects other areas within a company. For instance, if the Production Manager or the head of the Proposal Department decides that they need more personnel, then this means more work for the Human Resources Department. Or, if the Operations and Logistics Managers need a greater volume of raw materials or packaging supplies, then they'll need assistance from the Purchasing Department.

If a project map predicts a significant increase in sales and a company wants to consider expanding its production capacity, then other areas will have to get involved. The company will need input from engineering and finances, and it may need help from subcontractors with expertise in other disciplines. Conversely, if the project map predicts a decrease in sales, then each department has to help reduce the impact this will have on the company.

The Purchasing Process for Maintenance, Repair, and Operations: Going from a Project Map to a Contract Map (Opex Projects)

Some readers will be curious to know whether the *map of external players* or *map of internal players* can be used for another type of sale: the sale of routine spare parts or operational expenditures (e.g. bearings, fuel, industrial gases, maintenance services, lubricants, etc.).

Nowadays, the majority of these products or services are acquired through fixed-term contracts. These contracts are awarded to bidders and the process is similar to that of any other project that involves tendering. Depending on how strategically important or critical a product is, the *map of external players* can be useful if there are a lot of actors (e.g. external specifiers) that help decide which technology is the best fit. Other times, the user organization is the one that determines the specifications. As such, the *map of internal players* can also be useful for this type of buying/selling process.

Since the process for awarding supply contracts for MRO products and services (Opex) is similar to that of capital projects (Capex), the project map can also be useful here. In this case, it's more appropriate to refer to it as a 'contract map'. In this map, the stage previously known as 'construction' can now be referred to as 'implementation'. The implementation stage includes after-sales services or the sale of spare parts. The structure, usage, and effects of a contract map are exactly the same as those for a Capex project map.

MRO suppliers need to remember that contracts don't just appear out of thin air. By the time an MRO contract expires, the customer will have gone through several stages in which they've evaluated their experience with the supplier and may even have designed new specifications that are more well-suited to their application. These stages (e.g. contract performance feedback, specification design and preparation for bidding, for instance) might even have names that are analogous to the stages in a Capex project. A proactive Sales Engineer needs to familiarize themselves with this process and they should be prepared well in advance to respond to a customer's request for proposal.

Joint Customer-Sales Activities That Take Place During Project Development

This books has described consultative selling as an iterative process that takes place between an industrial company and its customers. The stages in consultative selling are equivalent to the stages in a Capex project; nonetheless, it's worth noting that in this chapter, the stages of consultative selling (Figs. 8.1 and 8.2) have been described from a general point of view, one that speaks for any and all relevant actors. Conversely, this chapter has described the stages in a Capex project in much greater detail, using vocabulary that's specific to Capex projects (Fig. 8.8). One important difference between these two is that Capex projects generally begin at Stage 6 of the iterative process (this is the stage when needs are defined and quantified). See Fig. 8.5.

During a Capex project, Sales Engineers frequently work with several other companies that have been outsourced by the investor to develop the project (such as conceptual, basic, and detailed engineering firms).

Capex projects tend to be much larger than the projects behind everyday sales. Because of this, Sales Engineers need to establish relationships with a much larger group of professionals at each organization. For the most part, these relationships involve a more multidisciplinary group of professionals from the supplier company.

Clearly, then, when it comes to Capex projects, consultative selling requires far more coordination and bilateral meetings between different actors. The Sales Engineer (assigned to a specific project) is responsible for coordinating people and activities both at the *external market player* level as well as at the *internal customer player* level. To do so, the Sales Engineer can use the project map and refer back to the activities and actors that participate in each stage. This is shown in the follow-up matrix in Fig. 8.16.

How Many Projects Can a Sales Engineer Manage at Once?

At any one time, there may be multiple Capex/Opex projects on the market per Sales Engineer (for more information on organizational structure and market segmentation the reader should refer to the relevant chapters in this book). So, naturally, the head of sales will want to maximize each Sales Engineer's productivity.

How many projects can one Sales Engineer handle? The answer to this question depends on a range of different factors, such as project size and complexity, how complex the technology is, the administrative workload, etc. Industrial sales have long since adopted the concept of a 'customer pipeline' or 'sales funnel'. The idea behind this concept is that for certain market applications, a supplier works on several projects from the very beginning and of these, only a fraction end up leading to a purchase order (Figs. 8.15 and 8.16).

There are several reasons why a supplier might not close a business deal with a customer company: the purchase order might go to a competitor or a substitute, the Capex project might be delayed until further notice or delayed indefinitely, or the supplier might decide that a project isn't sufficiently attractive and elect to remove themselves from the purchasing process. Over time, a Sales Engineer will acquire experience with a given market application and they'll learn what to expect from customers that are developing a project. From this experience, they'll get a better idea of how many projects they'll work on versus how many projects they'll win. This *ratio* is important. It helps determine how many parallel projects a Sales Engineer can identify, understand, and work on from the very beginning.

However, the quality of consultative work should always be valued over and above the number of possible sales. If Sales Engineers take on too many projects, then it's bound to diminish the quality of their work. When it's done poorly, consultative selling can lead to commercial and technical errors or substandard coordination. Even in the short-term, this can end up being very costly for both the customer and the supplier.

The Bidding Stage in a Business Project

What's the purpose of bidding?

There is any number of intuitive, yet misguided, answers to this question. In reality, industrial customers don't have to go through a bidding stage (which is costly,

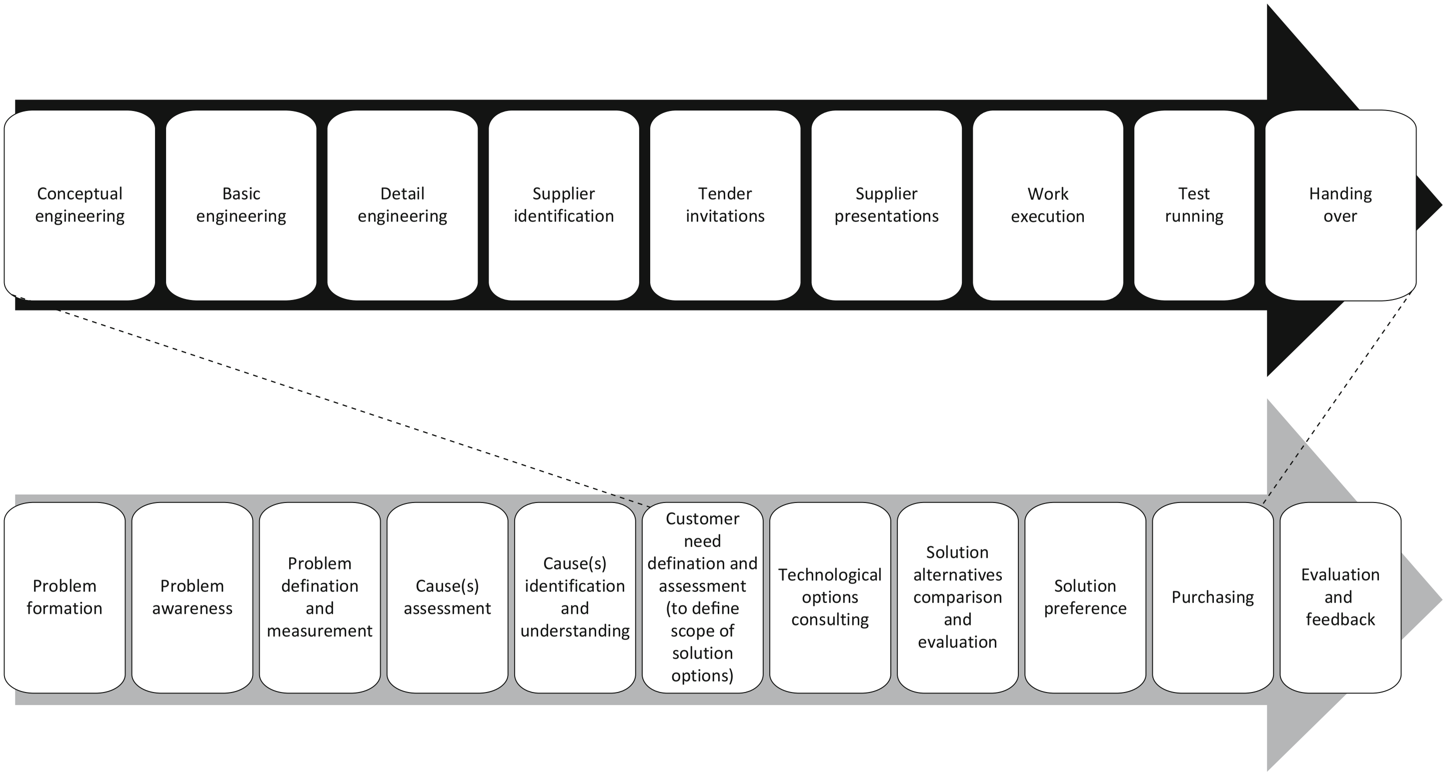


Fig. 8.15 This diagram illustrates how the consultative selling process for a Capex/Opex project is simply a subset of a company's overall consultative selling process. The complete consultative selling process consists of more initial stages; for instance, certain consultative selling activities take place during the problem (or opportunity) formation stage. Capex/Opex projects tend to be based on the past experiences of other entities that have faced similar issues and have successfully resolved them

PROJECT BEGINNING AND ENDING DATES	PROJECT PHASES	PROJECT PLAYERS AND INFLUENCERS	OUR PEOPLE IN ACTION	OUR ACTIVITIES
mm.dd.yyyy - mm.dd.yyyy	Conceptual engineering			
mm.dd.yyyy - mm.dd.yyyy	Basic engineering			
mm.dd.yyyy - mm.dd.yyyy	Detail engineering			
mm.dd.yyyy - mm.dd.yyyy	Request info to suppliers			
mm.dd.yyyy - mm.dd.yyyy	Bidding			
mm.dd.yyyy - mm.dd.yyyy	Final negotiations and conditions			
mm.dd.yyyy - mm.dd.yyyy	Construction			
mm.dd.yyyy - mm.dd.yyyy	Test Running			
mm.dd.yyyy - mm.dd.yyyy	Handing Over			

Fig. 8.16 Follow-up matrix for the various stages of a project. This matrix includes the start and end dates of each stage, the name of each stage, all of the relevant market and non-market actors for each stage, internal actors at the supplier company that participate in the sales process, and the company's marketing and sales activities for each stage

boureaucratic and laborious) in order to compare different offers. Moreover, they can find new suppliers on their own, or negotiate prices and payment methods without resorting to bids.

The purpose of tendering, then, is that it provides a level of transparency to conspicuous purchasing processes. For customers and/or regulators this can be important. This might explain why bidding is more common in publicly funded projects.

In principle, there's no need for progressive suppliers to be anxious or fearful about the bidding process: these suppliers know that the tendering process, and its result, are the product of intense and proactive work. They know that if a product is well-suited to an application (or best-suited), if their sales force has made an exhaustive effort, both technically and professionally (see above, this chapter), and if the price allows customers to benefit economically, then they stand a good chance of winning the order.

On the other hand, there are suppliers that wait until the last minute to present their offer (during the request for proposal stage) and that try to make up for their lack of initiative by lowering prices—these are the suppliers that have good reason to be anxious about the bidding process. In order to win the order, these suppliers need customers to be just as reactive and short-term minded as they are. And, it's good to be clear: reactive customers do exist and will always exist. They provide academia with numerous (often sensational) case studies that just go to show "the high cost of buying cheap."

More than any other stage in the industrial purchasing process, bidding reveals how few options are left for suppliers whose products are commoditized or mature. A lot of these products have to comply with established technical standards (e.g. ISO, DIN, CEN, ASTM, etc.), making it that much easier for customers to compare technical offerings and that much harder for uncreative suppliers to be successful. Some of these suppliers try to 'differentiate' themselves by offering services to go along with their commodity product—however, they'll soon become disheartened when they realize that even these services have been specified and are considered mandatory for every single competing supplier.

There's no special advice that can help these suppliers gain even short-term advantages. The only way for them to win purchase orders is from factors beyond their control: for instance, a competitor might not have enough installed capacity, or enough available working capital, or they might be too geographically removed from the customer, making the project untenable for them.

For these suppliers, the bidding process is a ruthless experience and it just confirms their commoditized mentalities.

As the reader has been warned throughout this book, the industrial marketing and sales concepts described here are not applicable to *me-too* or commoditized suppliers. In fact, quite the opposite. These concepts and practices are meant for suppliers that want to decommoditize their thinking and decommoditize their offer.

Proactive executives will ask themselves more interesting questions, such as: Why did my product mature and why is its design so similar to (if not the same as) the competitor's? What do we need to do to decommoditize?

Effectively, there aren't any special techniques or tricks that are going to help a commoditized supplier win the bid. However, a proactive supplier can do the following:

1. Convince the customer that the bidding process is unnecessary, expensive, and laborious and can be eliminated. If successful, the customer will not use bidding or tendering as a purchasing mechanism. Instead, their purchasing process will consult with suppliers as they normally would.
2. Demonstrate to the customer that their product is the best option for the customer's application, and that the customer would benefit if their technical specifications called for that particular product's characteristics. This shouldn't be misconstrued as manipulative or unethical. In this case, the customer is still carrying out the bidding process, yet, they already know which offer they prefer. The technical specifications won't allude to any particular industrial supplier brand. However, they'll be perfectly clear about the characteristics that define the superior product: functionality, attributes, services, and expected performance.
3. Avoid bids that commoditize a supplier's offer. Sometimes, a customer will ask to specify mature products and services, and they won't be willing to consider new product developments. When this happens, a proactive supplier can always retract themselves from the purchasing process, or simply not participate in the tendering process—that way, they avoid spending time and resources on a project with minimal sales prospects. Remember: the companies that win these types of bids are the ones that offer the lowest cost and/or price. Thus, if a proactive supplier finds themselves in this kind of situation, they may have incorrectly segmented their applications and potential customers.

The Essential Characteristics of Consultative Sales Force Personnel

This chapter has held off discussing the essential characteristics of sales force personnel until the very end. And, for good reason: so that the industrial sales activities described above give the reader a good idea of what kind of personal and professional traits a Sales Engineer needs to have.

Below, the reader will find a formal and summarized description of essential characteristics that are *sine qua non* for being a Sales Engineer:

- Outstanding analytical skills. This allows a sales force member to objectively detect, absorb, and understand a customer's technical, administrative, and business problems.
- An ability to communicate effectively with customers and their own business organization about any technical, administrative, business, or workplace behavior problems.
- Intense intellectual curiosity. They should feel driven to understand a technical product's design, construction, attributes, and functionalities.
- An equanimous and precise approach to discovering, analyzing, communicating, and discussing the advantages and disadvantages of technical products, regardless of whether they're the company's own products or not.
- Demonstrate a high level of empathy and agility for the rate at which customers are able to understand a new problem and the technologies that can be used to fix it.
- A high level of motivation and openness to learn and understand different issues when working alongside customers in the field.
- Adequate communication skills for interacting with customers, team members, and other personnel in their organization; this should be especially visible when dealing with complex coordination, performance crises, and interpersonal conflicts.
- Highly flexible so that they can detect, understand, and handle paradigm shifts and changes in their business environment.

As for Sales Engineers, their basic competencies should include: excellent IT skills, an education in science or engineering, adequate financial math skills, and excellent time management skills.

A lot of industrial companies may find that their current sales force doesn't possess these characteristics and competencies. These companies are still employing salespeople who've made their entire career at the company, have no formal education in science or engineering, and whose sales activities are based around their social skills with customers.

Sometimes, these sales representatives are considered ‘sacred cows’ within the company. They may possess a certain degree of seniority which gives them the leeway to behave arrogantly, lazily, or have a ‘know-it-all’ attitude.

Likewise, their customers will have gotten to know him/her, and both customer and sales representative may even feel attached to one another. Unfortunately, some people confuse this attachment with unconditional friendship. As a result, it can come as a big surprise when a customer decides to switch to another supplier. An old-fashioned sales representative might argue that, “it’s the company’s fault. I tried to warn the company that the customer was planning on buying from a competitor, but the company didn’t pay attention or didn’t listen”, etc.

While this may be a stereotype, this kind of sales representative can still be found at industrial companies. It’s very hard (if not impossible) to modernize their thinking and teach them to adopt a new paradigm of consultative selling. This point should be duly stressed: the longer a company waits to replace its old-fashioned sales force personnel, the more they’ll regret it.

The organizational structure of the sales force was discussed in Chap. 7. However, is worth remembering that when there are intermediaries with purchasing power between a manufacturer and the end-user, then the Sales Manager might want to consider using a twofold structure: Sales Engineers manage sales and after-sales support for projects and contracts, and sales representatives manage sales with intermediaries (such as distributors, contractors, assemblers, integrators, etc.). See Fig. 8.17.

Industrial Sales Force Compensation

At the majority of industrial companies, sales force personnel receive a base salary plus commission, which varies depending on how much they’ve sold to customers. There’s a somewhat outdated logic behind this, which is:

1. Motivate sales personnel with a ‘more for more’ system (which can also be understood as ‘less for less’). In other words, the more a sales representative sells, the more money he/she makes.
2. Make the sales representative responsible for his/her own time management. Since the sales representative is often in the field, they’re harder to manage. Their higher-ups can’t observe or inspect them as easily as they can office personnel.
3. It means that the cost of these personnel is variable. This type of compensation package means that when a company sells less, they also spend less on their sales personnel.

However, the question remains: why should industrial sales representatives receive variable remuneration when, for the most part, all other company members receive fixed salaries?

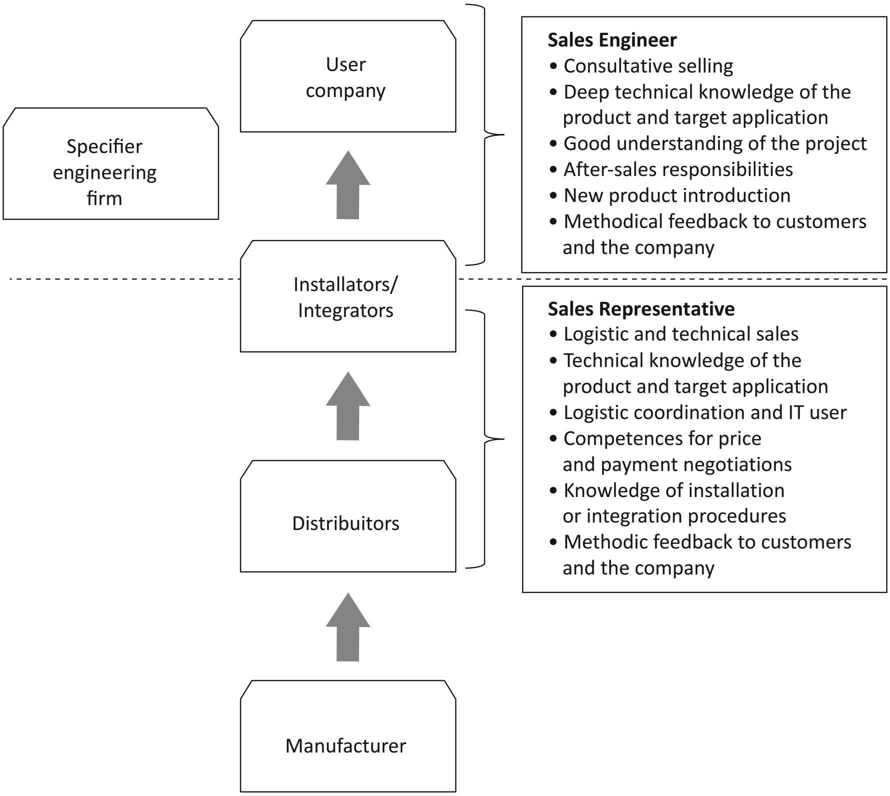


Fig. 8.17 Two types of sales force for two different stages in the industrial chain. Projects, contracts, and after-sales support for user-companies and specifiers need to be handled by a Sales Engineer who can lead a consultative selling project (described above, this chapter). Sales to distributors and other intermediaries can be handled by a sales representative. The sales representative's responsibilities include negotiation, logistics demands, and (if applicable) ensuring that a product can be effectively integrated into the downstream industrial chain. Sales force personnel should have a good understanding of a product's technology and its uses. Furthermore, they should input detailed data into the company's information system about each sale

One possible explanation for this phenomenon is that in the past, companies had idle capacity and manufactured standardized products. These companies required their sales representatives to go out into the world—perhaps traveling quite far—and attempt to use their persuasive skills on any number of potential customers. At the time, the salesperson may have been the only company employee without a set list of responsibilities, and without a set work schedule. Also, this might have been the only area of work in which doing more resulted in real benefits.

This question can also be stated the opposite way: what would happen if sales representatives received a dignified fixed salary with no commissions? Would they end up staying in the office, passively waiting to receive purchase orders and solving customer problems by email?

In this author's opinion so long as the sales force is made up of professionals like the ones described above (Sales Engineers), then paying sales commissions is unnecessary. Of course, for this to be true, two other essential conditions have to be met: a company has to be offering technically complex products that have not been commoditized, and the head of sales should be deeply knowledgeable about the market, its potential, and market trends.

Getting rid of commission can have a big effect on the way sales representatives manage their time with customers. Each customer becomes an important project, one that begins with the initial sales process and that lasts for the duration of a product's service life. The Sales Engineer can stop focusing on their own personal economic stability, or obsessing over closing a deal, or running to find their next purchase order. Likewise, it can make sales representatives more honest and transparent when discussing an offering. The customer will appreciate it when a supplier isn't anxious or aggressive during the sales process.

The downside of a fixed salary scheme is that Sales Engineers can settle for simply providing technical consultancy. This may require the Sales Manager to do more intense follow-up of the purchasing and closing process.

Naturally, a Sales Engineer has sales goals, and consulting and after-sales goals. The Sales Engineer knows that they have a job to do and that the company needs them to do it well. If they don't, and their performance consistently falls short of what their managers expect from them, then their job will be on the line. Just like everyone else!

A progressive company that implements non-commissioned based compensation needs to realize that this goes hand-in-hand with other kinds of developments: their industrial marketing should use advanced market research techniques, their segmentation according to application should be done precisely and intelligently, product development should be seen as a way of life, and industrial marketing should manage outstanding new product introduction programs.

Naturally, if any of these ingredients are missing, the Sales Engineer will quickly become disheartened at having to offer an inferior product or represent a negligent company.

If companies do decide to pay their sales representatives a base salary plus commission, they can calculate the commission as a percentage of the representative's profits (which can be calculated from the representative's business portfolio). The purpose of this is to keep the sales force from negotiating and offering lower prices or manipulating the company into providing unnecessary discounts to customers. However, even profit-based commissions have their limitations.

A company will need to decide whether to calculate commissions based on their theoretical profit (this is the price of the offer minus its cost *before* the offer has been implemented), or based on their actual profit once the offer has gone through. In the latter case, a company won't be able to accurately calculate their costs until after the offer has been implemented over a certain amount of time. Sales representatives might get upset about these types of calculations or about having to wait since, in their eyes, ‘they’ve already done their job’ (of course, as discussed above, this isn’t exactly true).

A further limitation to profit-based commissions is that companies aren’t always able to promptly or accurately determine their costs. Other times, companies simply may not want to share this kind of profit information with sales personnel.

Either way, a company should avoid designing a variable compensation plan that’s too tedious or complex, or one that relies on multiple variables.

9 The Distribution of Technical Products

Introduction

Some 3300 years ago, a cargo ship sank just off the coast of Uluburun, Turkey. It was carrying goods belonging to at least seven different ancient cultures: Mycenaean, Syro-Palestiniean, Egyptian, Assyrian, Nubian, Cypriot, and Kassite. Of its 20 tons of cargo, the majority consisted of raw materials: copper, tin, and glass ingots, as well as a ton of resin that was used to prevent the growth of bacteria in wine. The metal ingots were forged in a way that would have made them easy to transport on horseback from the maker's foundry to the customer.[1]

The discovery that many ports and ancient cities housed chambers for storing raw materials shows how sophisticated the trading system was prior to this shipwreck. A merchant navigator sold their products to an importer, who sold them to a distributor, who delivered them to a manufacturer. No doubt, either by word of mouth or in writing, the 'voice of the customer' made its way upstream through the various stages of this industrial chain.

Conceivably, a lot of these exporting/importing and distribution models, and their overall design are still being used today. Yet, there's a significant difference between the commerce of ancient times and modern-day commerce: nowadays, products are far more complex and varied, and communication is instantaneous, wide-spread, and exploratory in nature. In ancient times, perhaps the one additional benefit that a good distributor could provide was the ability to articulate customers' needs.

Today, this is not enough. For any modern-day industrial company, the ideal is to be in close physical proximity to an end-user.

[1] Uluburun—the discovery and excavation of the world's oldest known shipwreck. Fawcett, N. & Zietsman, J. Akroterion (North America) 46, March. 2012.

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_9

Yet, for reasons that will be discussed further on in this chapter, not all manufacturers can sell their products or services directly to end-users.

Some manufacturers think that the purpose of contracting distributors is to 'sell more' in geographic areas where they currently have no, or very minimal, sales. Whether or not this is said explicitly, from a strategic point of view it simply doesn't hold up. The right reason to contract distributors is to *serve end-users better*. While this may seem like a minor distinction, there's a huge difference between these two ways of thinking about distribution. Odds are, if a manufacturer is only trying to achieve more sales through distributors, it'll probably end up making ineffective and haphazard decisions. Anxious for sales figures that show how much the company has made, the manufacturer will end up making mistakes that cost it time, money, and its reputation. An industrial manufacturer should never forget that the most strategic customer is the *end-user*.

A lot of manufacturers also make the mistake of seeing their distributors as 'customers'. No doubt, their relationship involves transactions, bills, product shipping, collections, and payments.

All of these things divert a manufacturer's attention over to the distributor and, given the sheer volume of sales involved, the manufacturer can end up thinking that the distributor is its most important customer.

In the last 5 decades, some progressive manufacturers have gone from thinking about their distributors as 'adversarial organizations', to 'customers' and partners, and finally as 'members of their own company'.

This chapter argues that distributors should be considered *partners*, not customers. The end-user is the customer, and between the end-user and the manufacturer there are intermediaries. This statement shouldn't be misconstrued: intermediaries also have needs that a manufacturer has to address. Often times, product design can have negative or positive affects on the intermediaries in the industrial chain; as such, a manufacturer must remember that intermediary organizations play an important role in promoting sales.

However, when companies insist on thinking of their distributors as customers, they divert their strategic attention away from the end-user. In fact, even today, there are still manufacturers that think their distributor's needs are actual market needs.

Given the above, designing, analyzing, and choosing a distribution model requires having in-depth information about the end-user. Before making these decisions, a manufacturer should have researched the market (e.g. through a method such as the Discovery Team©), segmented and targeted specific applications, and should be working on developing and adapting its offering for target applications.

Given that the product or service is standardized, identifiable, and storable, a manufacturer will need to choose a distribution model based on the fragmentation and geographical dispersion of end-user customers.

The diagram in Fig. 9.1 applies to the majority of technical products. It shows four possible intermediation scenarios between a manufacturer and its end-users:

There are good reasons to use distributors if end-users are fragmented and/or geographically dispersed. Some of these reasons are:

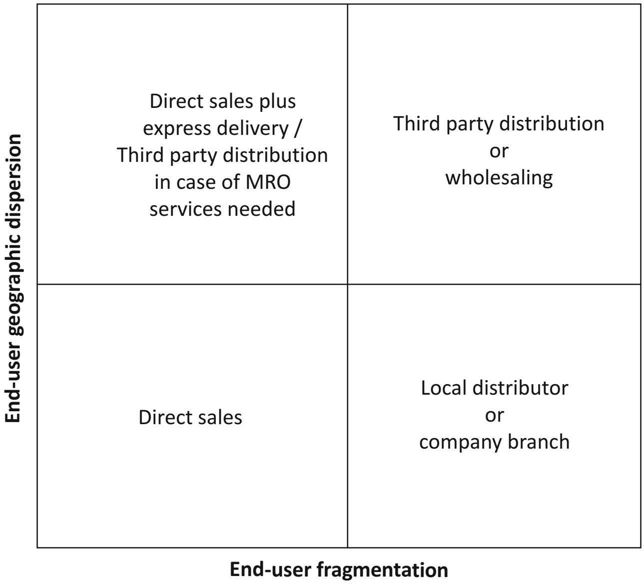


Fig. 9.1 This diagram contains two variables: end-user fragmentation and geographic (physical) dispersal. For a supplier, these variables determine the costs/benefits of choosing one distribution model over another. Each cell in the diagram describes the distribution model that corresponds to each case. This does not account for certain product/service characteristics that might necessitate other models (e.g. products that require integration, replacement stock, technical support, spare parts, etc.)

It's Costly for Manufacturers to Distribute Their Own Goods

In situations that require product or service distribution, an industrial manufacturer won't necessarily have the local facilities, organization, credit system, or product/service mix or stock that end-users need. Designing, investing in, and organizing their own distribution system can be prohibitively expensive and complicated. This is why manufacturers initially opt to sell their products/services to intermediaries, or as they'll be known from this point on, 'distributors'. Figure 9.2 shows the economic difference between using distributors in these types of situations versus not using them.

The Need to Provide Replacements and Repairs to Users for Whom the Product Is a Crucial Part of Their Operations

Quite often, technical products play a critical role in a user company's business. If a manufacturer isn't in close physical proximity to the user company, then it'll need an intermediary who can assist the customer in the event that the product is defective, malfunctions, or is damaged due to external causes. If manufacturers don't

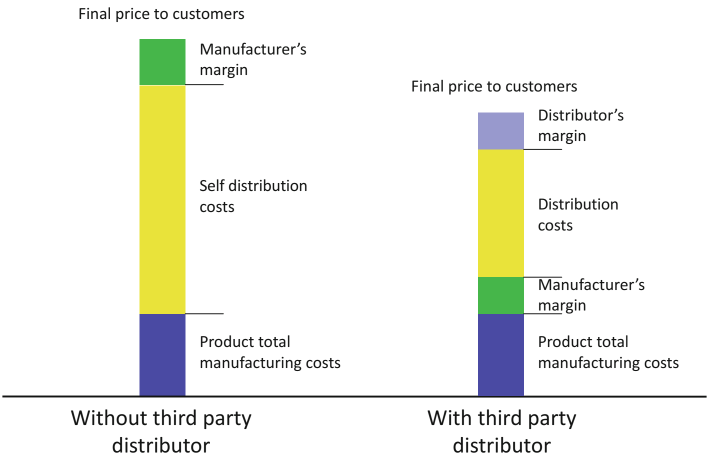


Fig. 9.2 This is a simplified graph showing how the use of distributors lowers the price of a product, notwithstanding a distributor's commission. Conversely, if a manufacturer decides to distribute a product themselves, the amount they save on commissions doesn't make up for the amount they invest in the distribution process itself

contract intermediaries and are far away from the end-user, it can take them far too long to respond to these emergencies. In the latter case, a damaged product can be incredibly costly for a customer—the customer may have to halt production, which can lead to highly expensive down-time and can damage their reputation with their *own customers*.

1. **The customer may require localized maintenance services or upgrades in order for their equipment to function properly**. In order for equipment or a product to function properly, it may need to be inspected and maintained by professionals. In some cases, the equipment will have to be sent to a separate facility in order to undergo a specialized maintenance process. Once again, designing and managing these distant maintenance services can be costly for a manufacturer, enough to make their own business untenable. In these situations, a distributor or dealer should have the right training and equipment to maintain the product throughout its service life.
2. **The finished product may need to be configured or integrated locally** (**made-to-order**). Sometimes, a product isn't finished until the user customer has requested certain modifications. There may be numerous ways to modify the product, which means that the manufacturer won't be able to deliver each one nor will the distributor be able to house each alternative. In these types of situations, the distributor is in charge of the last stage of the manufacturing process (this is known as co-manufacturing). One example of this are hydraulic hoses used for industrial applications. A distributor receives the customer's product specifications such as length and the types of connectors, and is subsequently responsible for 'manufacturing' these modifications. Figure 9.3 provides the

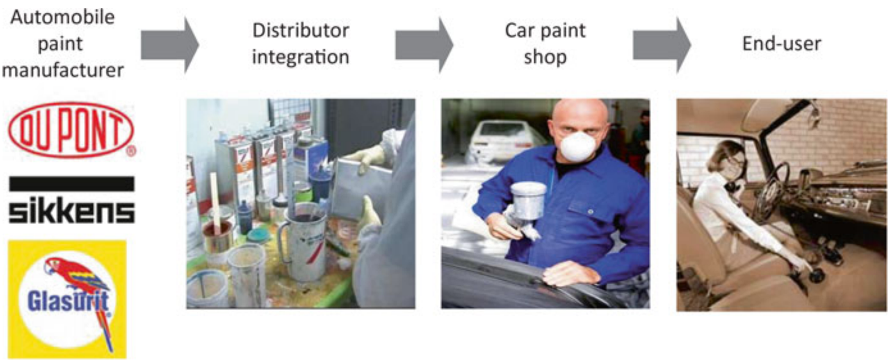


Fig. 9.3 Automotive paint distributors are a good example of an 'integrator-distributor'. They need to have an expert colorist at their facilities. Oftentimes, paint shops bring a sample of the car they're going to repair to the distributor (such as the car's gas cap) and the colorist prepares a paint mix to match the car's actual color. This type of distribution means that paint shops don't have to spend a lot of money to hire an expert colorist

example of automotive paints. In each of these cases, the distributor should have the requisite training and equipment to implement 'co-manufacturing'.

The Need to Provide a Sales Force and to Communicate with End-User Companies

Once again, if a manufacturer is faced with a lot of geographically dispersed user customers, it can be organizationally difficult, not to mention very expensive, to promote and educate customers about a product. Here, the distributor can serve as a promoter. For this, the distributor will need authorization to conduct technical consultations with customers about the offering. Moreover, the terms and conditions that a manufacturer negotiates with a distributor should be such that they encourage the distributor to actively promote the offer.

Some Distinguishing Features of Industrial Distribution

Readers who are familiar with consumer market distribution processes will find that industrial distribution is different in some important ways. Some distinguishing features include:

- Oftentimes, after-sales parts and services are crucial for ensuring a customer's operational continuity.
- Given that industrial products are increasingly complex, a distributor's sales personnel should have a high level of technical knowledge. Most of the time, promotional technical advice is delivered in the field or at a customer's facilities.

- There are less industrial customers than there are household customers. The former are more concerned with a product's availability, technical consultations and performance than with what the product or the distributor's facilities look like.
- In an industrial context, inventory risk is generally attributable to things such as market price and supply and demand for the product. In a consumer market context, there's more inventory risk that a product will suddenly go obsolete.

This chapter will discuss various industrial distribution strategies for manufacturers and distributors as well as different issues that frequently come up in their relationship. Such issues include:

Evolving from a Conflictive Relationship into a Partnership

As early as the 1990s, Fred Webster[2] noted that the relationship between industrial manufacturers and distributors had evolved from one of rivalry to one of cooperation. No doubt, this is ideal—it means that both organizations can achieve their mutual goals and, above all, benefit the user at the end of the industrial chain. Yet, even well into the twenty-first century, it's still easy to find manufacturer/distributor relationships that are strained or antagonistic for all sort of reasons. Among them:

- Mutual distrust: this is partly attributable to differences in business models. It's also due to the fact that either one (manufacturer or distributor) has ample opportunity to switch to another supplier or distributor.
- Cultural differences: a progressive industrialist is passionate about technology, its products, and the science behind product development and manufacturing. Conversely, a distributor's approach to business projects tends to be more versatile, independent, and centered on monetary gains.
- Differences in their cost-profit strategies: manufacturers tend to value sales volume and ongoing purchases from major customers, both of which help cover their fixed costs and capital investments. Meanwhile, distributors generally have less fixed costs and their revenue accounting tends to be based around individual sales events.
- While they're 'partners', they're nonetheless separated by distance and communication: ideally, both of these companies share the common goal of benefiting the end-user. However, a lot of manufacturers quickly forget this strategic premise. They start to think that the distributor is 'lazy', while the distributor thinks that the supplier is a 'dinosaur' that doesn't even understand the dynamics of its own market. The fact that distributors and manufacturers are physically and culturally separated means that neither one fully understands the other.
- Their future relationship is not fully planned out: oftentimes, when a manufacturer and distributor first decide to work together, they can be blinded by their own initial enthusiasm. As a result, they don't fully plan and outline their contractual terms

[2] Industrial Marketing Strategy. Frederick E. Webster Jr. John Wiley & Sons. 1991.

and conditions, potential problems, and the costs involved in the relationship. Before long, the manufacturer feels tempted to sell directly to a major end-user company or the distributor decides to deprioritize the partnership. These types of occurrences just exacerbate their mutual distrust and paranoia.

The Manufacturer's Responsibility to the Distributor

In this respect, a manufacturer's primary responsibility is to choose the right distributor. Their second responsibility is to treat the distributor as an extension of their own company and business operations.

The manufacturer should be patient, precise, and completely clear about the rules of the game from the very beginning. Unit costs are going to be higher if a company sells small amounts to numerous customers, as opposed to selling large volumes to major customers. Once a manufacturer has decided which distribution model suits it best, it should decide whether to give a distributor exclusive access to a market or whether the distributor will only work with low-volume customers. Of course, manufacturers should realize that in the latter of these two options, distributors will be less motivated. A manufacturer can counterbalance the lack of motivation by offering a better compensation system. There are some historic examples of manufacturers that chose the right distributors, gave them exclusive distribution rights, and were highly successful and gained significant competitive advantages as a result.[3]

Unfortunately, choosing the wrong distributor and giving it unrestricted access to a zone of influence, customers, and products can have fairly negative consequences: not only for the manufacturer, but also for the end-user and the distributor itself.

A manufacturer has a further responsibility to provide good industrial marketing: an intelligent and well-documented pricing system, consultations between the sales force and end-users and specifiers, development of better products, and well-designed new product introduction programs. These are not things that the distributor can do for the manufacturer. In fact, quite the opposite. A poorly thought-out pricing system, inadequate technical consultations with specifiers, an inferior product and a poorly-planned product introduction program—these are all sure fire ways to fail, regardless of how talented or motivated the distributor is.

The training that manufacturers provide to distributors is absolutely fundamental and deserves special mention. Frequently, manufacturers are under the impression that distributors have the easiest, most perfunctory job in the entire industrial chain.

Once they've signed the distributor agreement, a lot of manufacturers start behaving along the lines of YOYO (or *you're on your own*).

Yet, in order to sell technical products, a distributor has to understand the product's functionalities, attributes, components, and the benefits it provides for each target application. All of this evolves over time: products get better, customers develop, and applications change. Providing ongoing distributor training isn't just

[3] Marketing High Technology. An Insider's View. William H. Davidow. The Free Press. 1986.

about keeping distributors up-to-date on technical products/services—it has deeper implications. An ongoing training program motivates distributors to start working with a particular product line. Besides, an on-going programme fosters better information assimilation in distributors, which gives them the confidence to actively promote the product/service. Additionally, it improves interpersonal relationships, empathy, and communication between both organizations.

However, manufacturers need to support distributors in other ways, not just in the training room. The real problems come up in the field when the product is supposed to function in accordance with its specifications. At least in the beginning, when a distributor is first introduced to the new product, the manufacturer should accompany the distributor during the sale, installation/integration, and proper product use stages.

The Distributor's Responsibility to the Manufacturer

A distributor's primary responsibility is to think of itself as an extension of the manufacturer's operations and not just as a company that buys a product and sells it for a higher price. The latter occurs when distributors succumb to a culture of short-term sales.

For distributors that have an exclusive distribution agreement for highly renowned products or brands, it's that much easier to give in to temptation and function as mere 'warehouses' that sell credit.

A distributor's second responsibility to manufacturers is to clearly define their strategy and stick to it. Generally, it's easier for distributors to expand their product lines than it is for a manufacturer. This can make a distributor's business growth disorganized or irrational; it can even create a crisis in which the distributor realizes that its lost its share in markets where it once had a strong or leading position. If this happens, the one who suffers most is the manufacturer, who realizes too late that the distributor isn't as dedicated or as focused on the product as it once promised it would be.

Their third responsibility is to provide market intelligence to the manufacturer. As discussed in previous chapters, a manufacturer should never stop researching its end-users. However, distributors possess a kind of day-to-day market intelligence that they're sometimes reticent (and distrustful) to share. Not freely, anyway. This information has to with market statistics, customers, products, prices, volumes, etc.

Lastly, distributors have the responsibility to ask for help when they need it. There are a lot of really complex technical products out there and distributors lack the competencies to work with specifying engineers to provide technical consultancy for a Capex/Opex project. Getting help on a difficult project from the manufacturer's consultative sales team (even if it costs the distributor money) is part of what it means to be proactive and responsible. If distributors try to experiment with problems, they'll end up creating a lose-lose-lose situation: for the end-user, the distributor, and the manufacturer.

Types of Industrial Distribution

There are different types of distribution specialization that are best suited for different kinds of industrial products. Some of these are just variations of others. For instance, parallel distribution is essentially two distributors that are both *application specialists* that work within the same geographic zone. Industrial franchising is somewhat of a variation on exclusive distribution, whereas online distribution is a generalized (albeit virtual) form of distribution.

It's important for manufacturers and distributors alike to know and understand the various types of distribution models. Distributors, moreover, may have grown and evolved without ever being aware of the differences between these business models.

That being said, it's good to point out that industrial distribution has changed over the years. What follows is a description of 12 types of distribution—taken together, they paint a picture of what industrial distribution is like today.

It's worth noting that oftentimes, there aren't clear boundaries between one type of distribution or another. Distribution companies might adopt certain key features of one type of distribution while maintaining less important features of another. In more fortunate situations, manufacturers may be able to find distributors that clearly fall within one type of distribution.

For this very reason, when manufacturers start looking for a certain type of distributor within a particular geographic zone, they may find that such a distributor doesn't exist or that they've already been contracted out by a competitor. When this happens, a manufacturer can either adapt its supply model as best as possible or develop its own distributor from scratch.

A Product Specialist Distributor

Product specialist distributors (PSD) mainly promote, stock, and sell a limited variety of technical products. Examples of such products are: valves, pumps, pipes, steel, wood, chemical products, etc. Oftentimes, these products are technically complex; as a result, customers may require dedicated and comprehensive technical support in order to design technical specifications and choose the right product for their application.

Some product specialist distributors exclusively represent one brand, others represent several different manufacturers' brands at once. Additionally, these distributors can either specialize in one or several market applications.

Figure 9.4 provides a schematic representation of this type of distribution. Here, the distributor represents several different manufacturers' brands and serves various market applications.

Generally speaking, product specialist distributors are very technically knowledgeable about the product or product line they represent. This means that they're able to put this knowledge to good use: a more specialized sales force, and an offering that includes other complementary products (ones that are integrated into one another and function together), as well as maintenance and repair services.

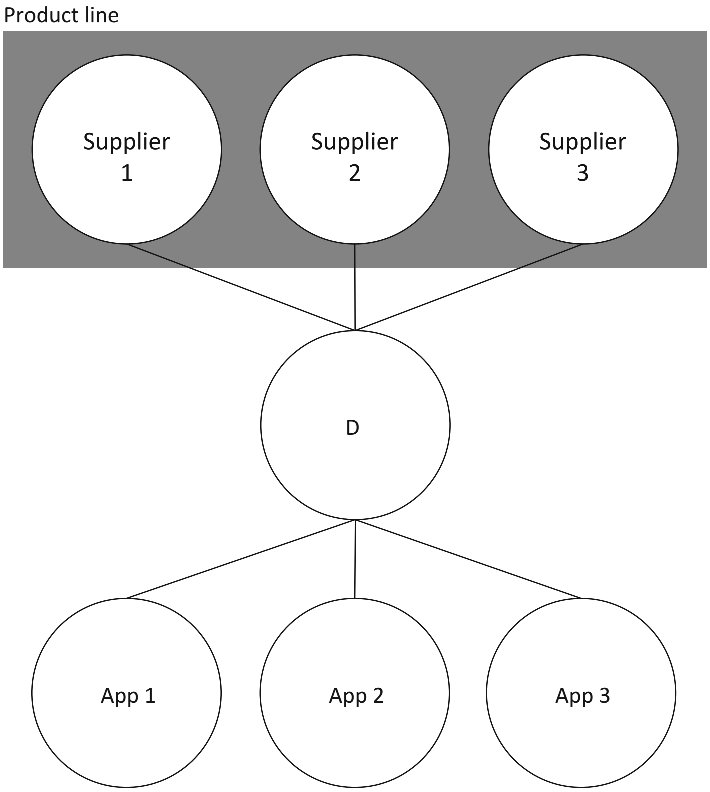


Fig. 9.4 This diagram shows the standard manufacturer-distributor-market configuration for product specialist distributors. The upper part of the diagram shows various manufacturers (1, 2, 3) that sell their product (or product line) to a specialized distributor (D). In turn, the distributor sells the products for various market applications (A)

One of the disadvantages to this model is that a distributor's specialized knowledge may only extend to a finite number of market applications. This can be limiting for a manufacturer whose product mix is designed for various applications. In this case, some manufacturers might decide to contract another, parallel distributor (see below). Additionally, this kind of distribution creates a high level of mutual dependency between manufacturer and distributor. If some kind of conflict arises and the relationship breaks down, then it could leave both companies incapacitated and unable to reach their objective market. As such, it's important that for this type of distribution model, the contractual terms and conditions are clearly laid out and any potential conflicts are anticipated.

The advantages and disadvantages of this type of distribution model are shown in Fig. 9.5.

If a product specialist distributor wants to negotiate better terms with manufacturers, it should develop certain competencies. These competences are closely tied to a distributor's level of prestige amongst customers, itself a good indicator of the

Advantages	Disadvantages
PED has a higher degree of product and service specialization. It is easier to introduce new products through a PED	Certain PEDs might not be willing to sell or work with all potential customers in its the area of influence. Likewise, some customers might not be willing to work with a particular PED
PED can supply their customers with MRO services such as on-site or near-by maintenance and repairs	If a PED is specialized in an application that is not the manufacturer's target, the manufacturer might be compelled to contract multiple distribution
PED can supply complementary products and services to the main product offered by a manufacturer	PED requires an intense relationship management; the termination of a manufacturer-PED relationship can be very detrimental for both companies.
PED usually specializes in a few product applications	

Fig. 9.5 A summary of the advantages and disadvantages of using a product specialist distributor (PSD)

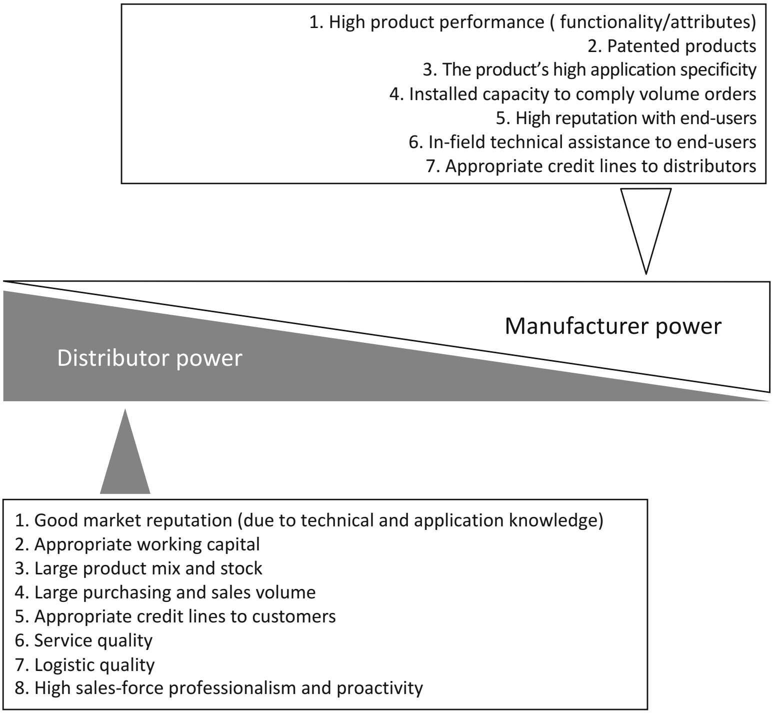


Fig. 9.6 This diagram illustrates the balance of power and mutual dependency between a manufacturer and a product specialist distributor. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

distributor's technical capabilities and the quality of its distribution operations. There are other competencies that a PSD should have that are common to other distribution models. These include: purchase volume, the payment conditions offered to customers, and product availability (stock).

Figure 9.6 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

The competencies that a manufacturer needs to have in order to negotiate better terms with distributors are closely tied to its products' performance, variety and availability. If a manufacturer's product design is groundbreaking, then having intellectual property rights or a patent can be a significant bargaining tool. Likewise, an ongoing market research program (e.g. Discovery Team©) and a good reputation amongst end-users are important factors that improve a manufacturer's standing and bargaining power. Other competences that are always helpful to manufacturers include: product availability, and increased credit lines for distributors.

When should a manufacturer contract a product specialist distributor?

For a manufacturer, this kind of distribution makes sense in the following situations:

(a) When end-users are fragmented and geographically dispersed (see Fig. 9.1)
(b) When products are highly complex or sophisticated and require proper technical consultation.
(c) When the product is integrated into or complements other products that are also distributed via specialized distribution.
(d) When products require additional complex services, such as on-site maintenance and/or repair services in the event of product malfunction.
(e) When a manufacturer is consistently introducing new, technically complex products.

A Technology Specialist Distributor

Technology specialist distributors (TSD) represent and distribute product mixes that are integrated together through engineering and/or applied science. For instance: they might distribute products for hydraulic systems (including oil hydraulic systems), surface coatings, information systems, etc. Since these products are closely related and integrated together, a lot of distributors will be able to design customers' technical specifications and, not infrequently, they can provide integration and assembly services. As a result, technology specialist distributors have a diverse, yet related, product mix.

Another way to understand this type of distribution, is to think of these distributors as engineering firms that commercialize (and even install) the products that they themselves specify for user customers.

Oftentimes, technology specialist distributors work with a wide variety of market applications. This is shown in Fig. 9.7.

Paradoxically, a lot of technology specialist distributors are unaware that they fall into this category. Some may think of themselves as product specialist distributors, while others think of themselves as a company that provides services (engineering and assembly services for a particular technology). It's a good idea for these distributors to discuss internally whether or not each of its different business units can develop its own technological specialty.

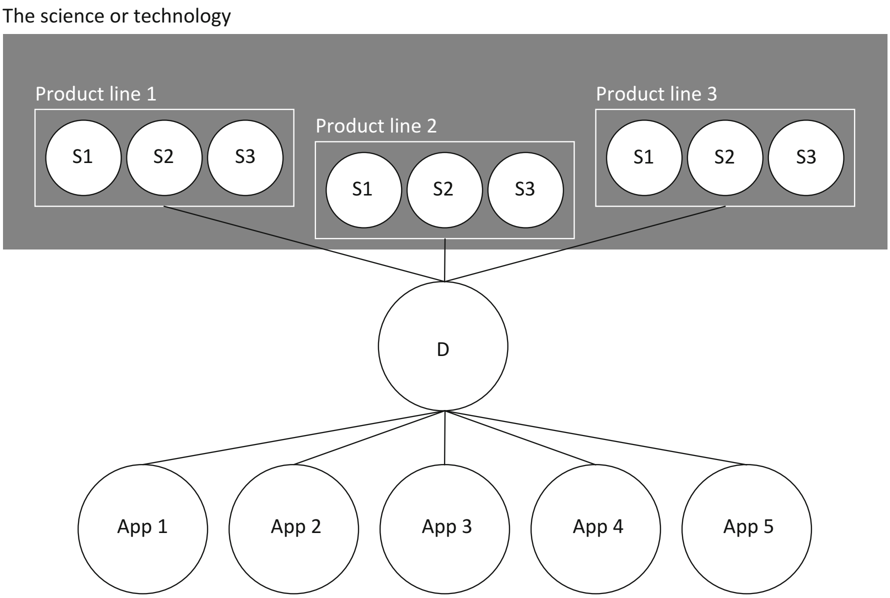


Fig. 9.7 This diagram shows the standard manufacturer-distributor-market configuration for technology specialist distributors. Manufacturers are shown in the upper part of the diagram; in this case, there are various suppliers (S). Each of them provides the distributor (D) with products (or product lines) that are related to a specific type of technology (shown as 'Technology' in the diagram). In turn, the distributor sells these products for various market applications (A)

Otherwise, with time, it's easy for industrial distributors to become disorganized and end up functioning as mere warehouses for all sorts of stuff. Before long, they'll realize that other distributors (ones that offer more integrated products) are catching up to them at an inexorable rate. Even product specialist distributors can lose control of a market when they're competing against technology specialists.

For a manufacturer, there are advantages and disadvantages to contracting a technology specialist distributor. These are summarized in Fig. 9.8.

Successful TSDs are at a huge advantage when they're negotiating with well-established manufacturers: usually, they're the ones that develop customers' technical specifications and recommend certain features for customers' 'integrated technology systems'. This might be the only distribution model where it's easy for distributors to rid themselves of an established manufacturer if negotiations, or renegotiations, don't go well or create a rift in the relationship. Sometimes, a technology specialist's *brand notoriety exceeds* that of its supplier-manufacturers'.

Figure 9.9 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

Advantages	Disadvantages
TED has a higher degree of product and service specialization. It is easier to introduce new products through a TED	TED has more negotiation power over manufacturers due to its engineering or scientific expertise and its complex mix of products and services
TED can supply their customers with MRO services such as on-site or near-by maintenance and repairs	Technology specialization makes TED less dependent on prestigious manufacturer brands
TED can supply complementary products and services to the main product offered by a manufacturer	TED frequently works with several manufacturer brands at once
Technical assistance to customers and proper specification design tend to be more profound with TED	
TED can also provide installation/integration if necessary	

Fig. 9.8 A summary of the advantages and disadvantages of using a technology specialist distributor (TSD)

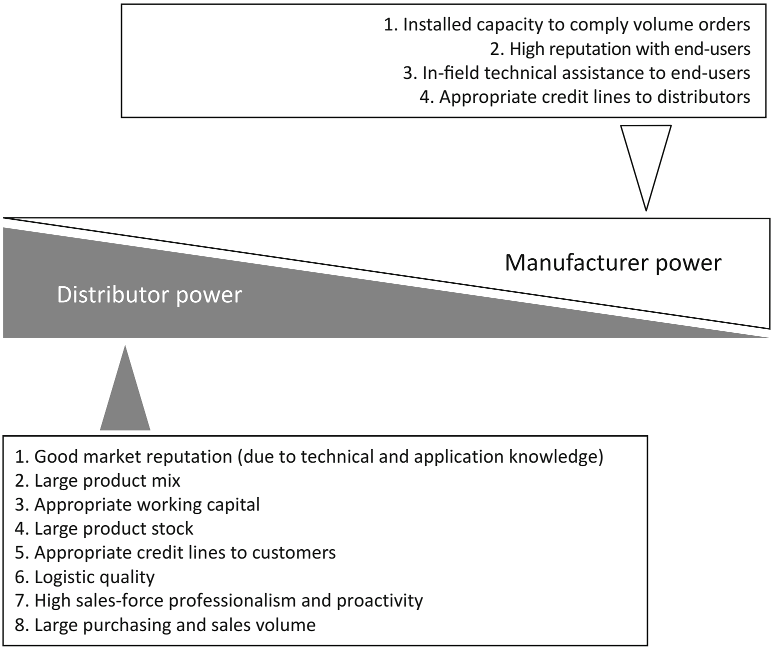


Fig. 9.9 This diagram illustrates the balance of power and mutual dependency between a manufacturer and a technology specialist distributor. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

If technical product manufacturers are highly dependent on TSDs, they should make sure to actively research the applications where their products are being used. When dealing with highly technical and professional industrial chains, it's a good idea for manufacturers to constantly redesign and introduce better versions of their product, ones that benefit end-users and that facilitate the distributor's operations.

When should a manufacturer contract a technology specialist distributor?

An industrial manufacturer may want to contract a TSD if its technical products require a high level of integration with other components/equipment (e.g. computer hardware/software, industrial PSA gas generators, etc.). Also, a manufacturer may want to contract a TSD if its products require significant maintenance and functionality support.

An Application Specialist Distributor

As the name suggests, application specialist distributors (ASD) sell products and services designed either for a specific application or for various applications within the same industrial sector. These distributors might also be product specialists (if the market application is wide-spread and well-developed) or generalists (several products for one application). In the latter case, distributors function as a one stop shop, providing a comprehensive product mix of MRO items (*maintenance*, *repair*, *operations*) for customers within a particular application/industrial sector. As such, these distributors are generally located close to where the product is being used.

In this case, 'application' has a broader definition than the one presented in this book's chapter on 'market segmentation'. For instance, the products/services in question are offered to an 'industrial segment' or 'industrial sector': automotive, defense (army and navy), mining, agricultural, vineyards, etc. Some smaller distributors, however, may choose to specialize in a more narrowly defined application (e.g. a distributor that provides replacement parts for ship engines).

Figure 9.10 provides a schematic representation of this type of distribution. Here, the distributor represents several manufacturers' brands within a single industrial sector (which is its objective market).

One of the major advantages of this type of distribution is that ASDs are knowledgeable and close to target customers. For instance, not only will an ASD's sales force be familiar with customers' overall production processes, but it will also know about customer needs and any defining customer characteristics. Not to mention, they tend to be familiar with different decisional roles at customer organizations, and have a better understanding of these customers' adoption and purchasing behavior.

On the other hand, manufacturers of high-end industrial products will find that one of the biggest disadvantages of this type of distribution is that sometimes ASDs are too small, with a low sales volume, and a small sales organization. If manufacturers decide to use a small distributor for a given application, they'll come up against the same kind of limitations that are typical of any small business: such as working capital or willingness to work with a wide customer base.

For a manufacturer, there are advantages and disadvantages to contracting an application specialist distributor. These are summarized in Fig. 9.11.

Under this distribution model, negotiation (or renegotiation) power stems from the strength of a distributor's relationship with target application customers, how

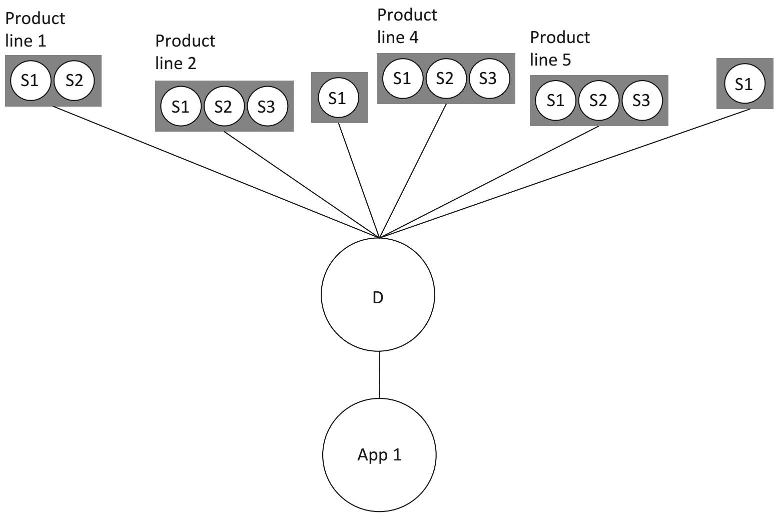


Fig. 9.10 This diagram shows the standard manufacturer-distributor-market configuration for application specialist distributors. Manufacturers are shown in the upper part of the diagram; in this case, there are various suppliers (S). Each of them provides the distributor (D) with products (or several product lines). In turn, the distributor sells these products to customers within a particular market application (A) or within a specific industrial sector (e.g. mining, automotive, etc.)

Advantages	Disadvantages
AED tends to design its organization, procedures and systems to better serve the target application (culture, language, credit lines, documentation, permits, etc.)	Highly specialized AEDs tend to be smaller enterprises (lower sales, credit, customer portfolio, etc.). Larger AEDs might offer less services and a more superficial technical assistance
AED tends to be close to the application of interest	AED frequently works with several manufacturer brands at once
AED can supply MRO services such as on-site or near-by maintenance and repairs	

Fig. 9.11 A summary of the advantages and disadvantages of using an application specialist distributor (ASD)

well the manufacturer's product performs, and a user-client's experience with the product. Out of all the distribution models, application specialization is one of the most demanding in terms of relationship management and the ongoing training that it requires from the manufacturer.

Once again, Fig. 9.12 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

When should a manufacturer contract an application specialist distributor?

Some of the reasons for contracting an ASD include:

(a) A manufacturer may decide to enter into a new market application. Of course, this assumes that a manufacturer needs to use a distributor in the first place (see

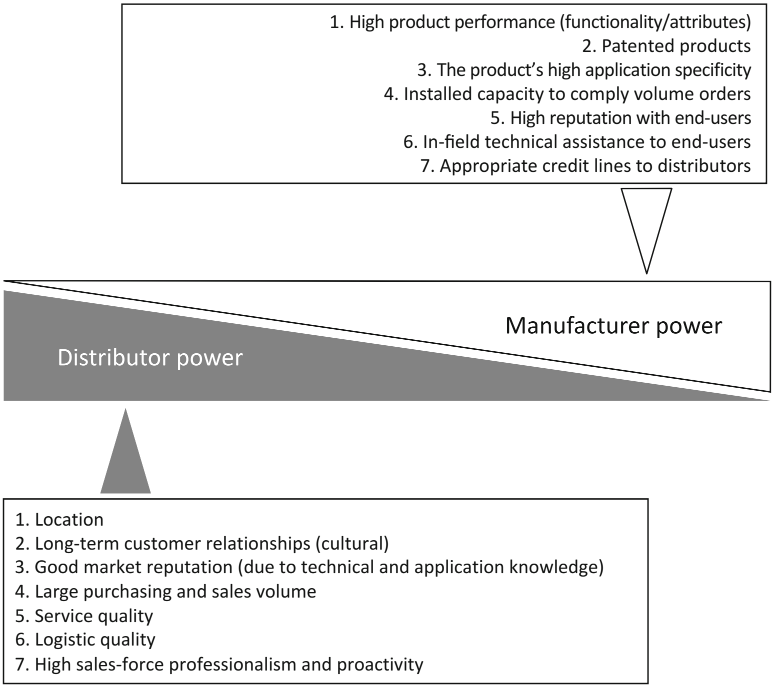


Fig. 9.12 This diagram illustrates the balance of power and mutual dependency between a manufacturer and an application specialist distributor (ASD). Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

diagram in Fig. 9.1). Application specialist distributors tend to invest significant time and resources into building trust with target application customers—customers come to rely on the distributor for its technical knowledge and professionalism.

(b) Not only can a manufacturer contract an ASD, but it can do so through an exclusive representation agreement. For a manufacturer, there are a lot of advantages to exclusive representation through a prestigious distributor—especially if the manufacturer's direct competitors are relying on weaker distributors, or are doing their own distribution.

(c) A manufacturer might be in a position where its constantly introducing new products for a given target application. And, naturally, the manufacturer will need to do so through distributors (see Fig. 9.1). In this case, however, it's important to distinguish between generalist distributors and distributors that specialize in a few product lines. Since generalist distributors have a larger product mix, they can't spend as much time as a specialist would on promoting the new product. In the latter situation, a manufacturer will need to use its own resources to promote its product/service to end-users.

(d) When a product is very sophisticated or complex, a manufacturer will need a technically knowledgeable distributor to promote its technology. For this very reason, the supplier-distributor partnership is that much better when the ASD is also a product specialist. Conversely, users can end up wary and mistrustful of a manufacturer that tries to distribute high-tech products through a generalist distributor (notwithstanding other mistakes and omissions that occur when a generalist distributor promotes a technical product).

A Generalist Distributor

An industrial generalist distributor (GD) manages and promotes a very diverse mix of product lines. Under this distribution model, a distributor handles products that are relatively low-tech and that don't require its salespeople or customers to be very technically knowledgeable. Or, in other words, end-users will either already be familiar with the product or they can easily learn about the technology and how to use it.

Nevertheless, large generalist distribution companies have intelligently divided up their organizations, creating separate departments that specialize in particular product lines. In doing so, they've been able to adapt to the increasing sophistication and complexity of technical products. Of course, this doesn't mean that generalist distributors have the same degree of specialization, commitment, or technical knowledge as other types of distributors (such as product or technology specialists, etc). In fact, far from it.

Generalist distribution is designed to sell in fragmented markets and for different industrial applications. A generalist distributor tends to have several branch offices in different locations (corporate-owned chains), a high sales volume, and a high rate of stock rotation.

Figure 9.13 provides a schematic representation of this type of distribution. Here, the distributor represents several different product lines for various market applications.

It's important to point out that sometimes, when there's a large number of customers in a particular market segment, a generalist distributor may decide to specialize in that segment. For instance, a generalist distributor might specialize in house construction.

If a manufacturer's products are mature, standardized, or relatively low-tech, generalist distribution is the best option for getting large volumes of its products to a fragmented customer base. These distributors tend to be located close to users and can offer credit to large volume customers.

Unfortunately, out of all the distribution models, this type of distribution is the one most likely to generate an unstable and conflictive relationship between a manufacturer and distributor. Most of the time, the products on offer are mature, commoditized, or generic and distributors prefer having several different supplier-manufacturers to choose from. Generally, under this model, distributors can swiftly replace manufacturers that don't consent to their business terms.

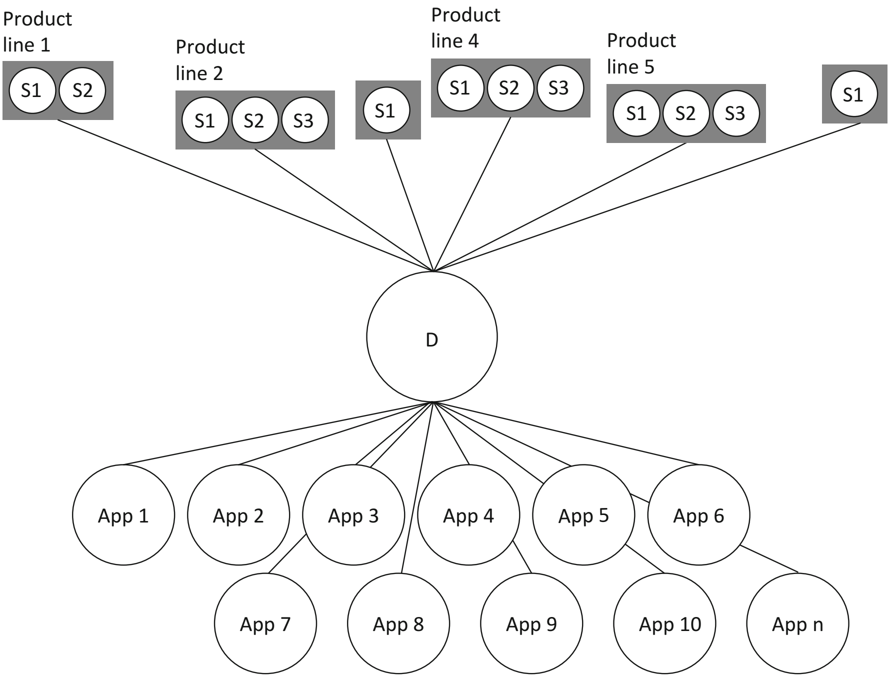


Fig. 9.13 This diagram shows the standard manufacturer-distributor-market configuration for industrial generalist distributors. Manufacturers are shown in the upper part of the diagram; in this case, there are various supplier brands (S). Each of them provides the generalist distributor (D) with products (or several product lines). In turn, the distributor sells these products to customers in several different market applications (A) or to customers within a specific industrial sector (e.g. construction)

Advantages	Disadvantages
GD tends to be more ubiquitously located. It is easier to find a GD nearly everywhere	GD is usually less specialized in product technology and their technical assistance tend to be superficial
GD tends to be large size companies, which implies more credit lines available for user customers	GD is usually less application specific relative to other forms of distribution
GD is usually open to use expensive mass communication for promoting its offer (radio, local papers, internet, etc.)	GD tends to have a stronger negotiation power over manufacturers due to its wide range of products offered, its purchasing volume and its more liberal credit to users
GD usually displays successful products for effective customer awareness	

Fig. 9.14 A summary of the advantages and disadvantages of using a generalist distributor (GD)

For a manufacturer, there are advantages and disadvantages to contracting a generalist distributor. These are summarized in Fig. 9.14.

Under this distribution model, the distributor's negotiation (or renegotiation) power stems from purchase volume, geographic location, and its customer credit system. On the manufacturer's end, negotiation power hinges on factors such as product availability and brand reputation.

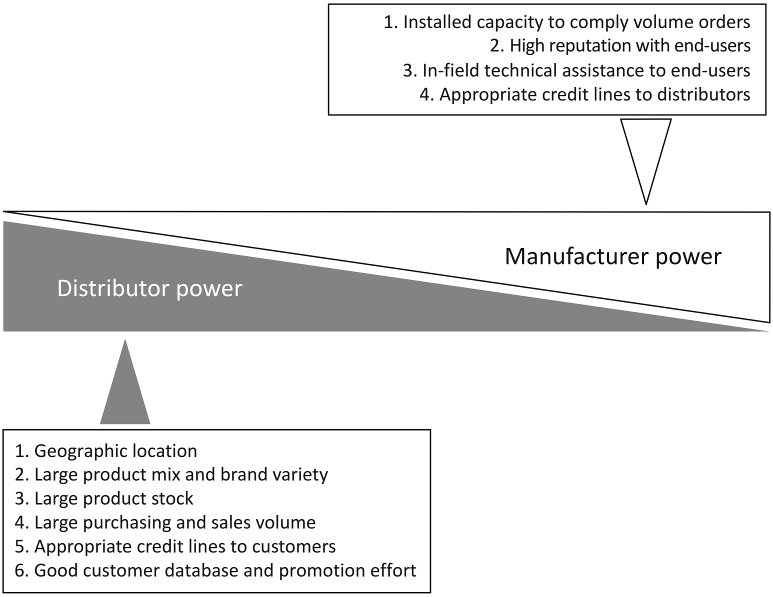


Fig. 9.15 This diagram illustrates the balance of power and mutual dependency between a manufacturer and a generalist distributor. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

Figure 9.15 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

When should a manufacturer contract a generalist distributor?

An industrial manufacturer can contract a generalist distributor if its products are standardized, sold in large volumes, and are already familiar to end-users (mature products). In principle, since the end-user is already familiar with the product, they won't require much technical support from the distributor. Once again, if a manufacturer is going to opt for generalist distribution, certain conditions need to be met that have to do with the fragmentation/geographic dispersal diagram in Fig. 9.1. Oftentimes, a high-end technical product begins to mature once it has served more demanding applications during the product's initial life-cycle stages. During this period, the product will probably have been distributed through product specialist distributors or the like (e.g. distributors that specialize in air compressors, tools, certain materials, etc.).

Most likely, if a product is mature, standardized, or manufactured in large volumes, its end-users are going to be geographically dispersed. Because of this dispersal, there are several advantages to contracting a generalist distributor with corporate-owned chains. In this case, a distributor might have distribution centers where manufacturers can send and store their products; subsequently, these products are sent out to different geographic locations. This type of distribution logistics and administration can save a manufacturer a lot of money.

On the other hand, since customers are so fragmented and geographically dispersed, some manufacturers may only need for their products to be *available* in sufficient quantities someplace close to the end-user. As long as the manufacturer is the one promoting the product and providing technical support to user-customers, these products can be more technically complex than the ones a GD would normally offer. However, given the terms of some of these contracts, using a generalist distributor solely as a 'warehouse' can become prohibitively expensive.

Exclusive Industrial Distribution

An exclusive distributor (ED) signs a contract with a manufacturer to only distribute its products, services, and replacement parts within a specific geographic area.

In turn, the supplier agrees not to sell its products, services, replacement parts or provide training to any other distributor within the agreed upon geographic area. That way, the distributor agrees not to market or sell a competitor's products, and the manufacturer agrees not to sell its products to another distributor in the area.

Since a manufacturer may want to contract another exclusive distributor for another geographic area, it's important to clearly establish the boundaries of a distributor's zone of influence. The geographic area could be an entire country, a region within a country, or some other clearly defined space.

Figure 9.16 provides a schematic representation of exclusive industrial distribution. Here, the supplier (S) has contracted two exclusive distributors for two

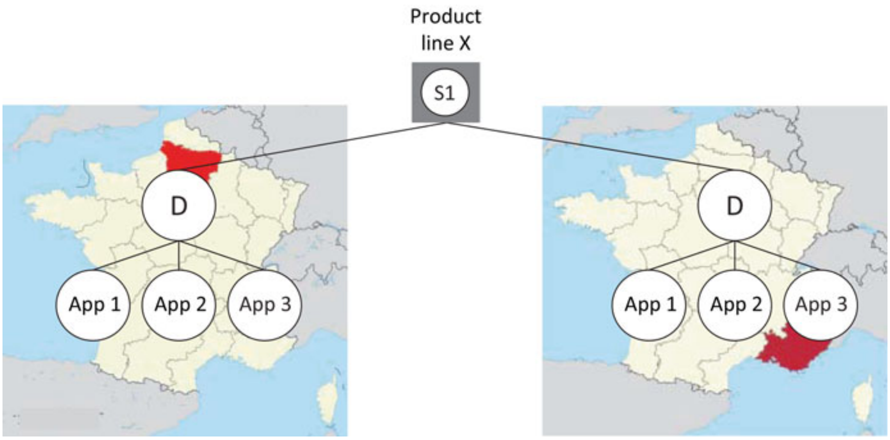


Fig. 9.16 This diagram shows the standard manufacturer-distributor-market configuration for exclusive distributors. In this case, a single supplier (S) is shown in the upper part of the diagram. The supplier sells its products (product lines, services, and replacement parts) to exclusive distributors that work in specific geographic areas (D1 and D2; highlighted areas). In turn, the distributors sell these products for various market applications (A) within their zone of influence

different zones of influence. Exclusive distributors might only represent a few products, or they could represent several (a product line). Furthermore, distributors might sell the products for one or more applications.

The type of companies that enter into exclusive distribution agreements tend to be high-caliber industrial manufacturers and regionally based industrial distributors. Not surprisingly, then, a manufacturer can have demanding technical, financial, and commercial requirements for distributors. An exclusive distributor has to agree to provide a level of service, logistics, dedication, and technical consultation on par with the product being represented. Not to mention, the distributor needs to establish a minimum sales goal for a set period of time.

The manufacturer will need to provide ongoing technical training to the distributor as well as discuss any new product developments. As a general rule, the distributor is free to price the product as it see fit.

The main advantage of exclusive distribution is that, in exchange for exclusivity, distributors provide a high level of technical knowledge, and high-quality services, sales, and marketing. In order to ensure good customer service, these kinds of distributors often have first-rate facilities and a complete stock of inventory (products and replacement parts). They have a knowledgeable sales force and provide excellent technical support.

For a manufacturer, the disadvantages of this model have to do with the distributor's self-imposed limitations with regards to its own target customers. For instance, a distributor might not be willing to work with all of the applications that a manufacturer is interested in. In these kinds of situations, a manufacturer may need to resort to parallel distribution.

In an exclusive distribution relationship, negotiation and interpersonal relationships need to be handled with care; this helps resolve any conflicts that, inevitably, come up later on. Except for a few exceptions in which a manufacturer is forced to terminate its contract with a distributor, exclusive distributors tend to be successful companies whose brand reputation can, and does, influence the market. Not to mention, both of these successful companies (manufacturer and distributor) tend to have intense organizational cultures; so, unless things are fully discussed ahead of time, there can easily be conflicts. If the manufacturer-distributor relationship does break down, it can be a dramatic experience for them both. Until a manufacturer finds another distributor, both companies will suffer damages to their reputations as end-users are left without after-sales support, replacement parts, and other services.

There are advantages and disadvantages to contracting an exclusive distributor. These are summarized in Fig. 9.17.

Both distributor and manufacturer will need to evaluate one another. A distributor can increase its negotiating power by designing an offer that includes other, complementary products, thus creating an integrated product offering. This is in addition to its excellent technical support and a professional sales force that's truly committed to serving end-users. In sum, these distributors need to have a good reputation amongst end-users.

Advantages	Disadvantages
ED has a higher degree of product and service specialization. It is easier to introduce new products through a ED	Certain ED might not be willing to sell or work with all potential customers in its the area of influence. Likewise, some customers might not be willing to work with a particular ED
ED can supply their customers with MRO services such as on-site or near-by maintenance and repairs	Cultural disagreements. The manufacturer and the ED frequently have different organizational cultures, which makes it easy for conflicts to appear
ED can supply complementary products and services to the main product offered by a manufacturer	ED requires an intense relationship management; the termination of a manufacturer-ED relationship can be very detrimental for both companies
ED usually has a better service toward customers, and is willing to follow the standards suggested by the manufacturer	ED requires intensive, costly and permanent training from the manufacturer
	In some cases, ED can develop a stronger brand awareness and reputation than the represented manufacturer's

Fig. 9.17 A summary of the advantages and disadvantages of contracting an exclusive distributor

A manufacturer's negotiating power depends on its reputation amongst target application customers, the quality of its products, and its level of specialization. Naturally, the best possible 'marriage' is between a prestigious manufacturer that makes excellent products and a prestigious distributor that provides excellent services.

Figure 9.18 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

When should a manufacturer contract an exclusive distributor?

Exclusive distribution is a good option for industrial manufacturers that are looking for committed, high-quality distributors. In exchange for exclusivity, manufacturers can be more demanding. They can require distributors to provide a high level of service and commitment to end-users. As such, this is the model of choice for a lot of prestigious manufacturers with technically complex products. Odds are, without a high degree of technical knowledge, distributors wouldn't be able to properly commercialize, install/integrate, operate, and provide technical support for these prestigious and innovative products. Out of the many types of distribution, an exclusive distribution agreement with an outstanding distributor is one of the few that guarantees the sort of high level service that reputable manufacturers expect.

Consequently, in order for distributors to be considered candidates for exclusive distribution, they should have a history of success in their markets. This includes sales volume, excellent services, and a high degree of technical knowledge in order to educate end-users.

Also, a high performing exclusive distributor is one of the best options for manufacturers that are constantly introducing new products into the market. In fact, exclusive distributors themselves really value new and improved products.

Unfortunately, if the manufacturer-distributor relationship breaks down, this can have serious implications for sales and end-user support and it can be a dramatic experience for both companies.

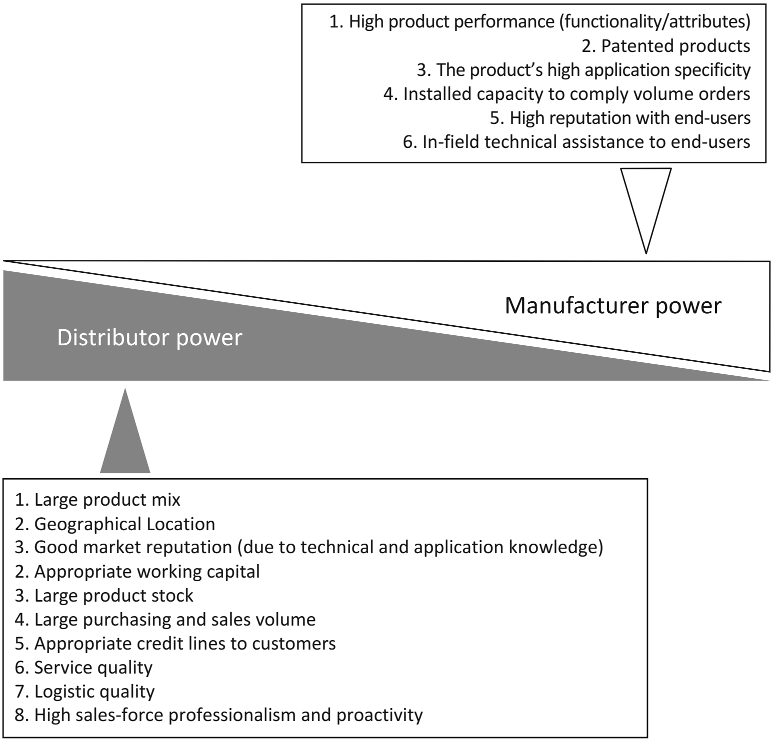


Fig. 9.18 This diagram illustrates the balance of power and mutual dependency between a manufacturer and an exclusive distributor. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

Multi-Channel Industrial Distribution

In a multi-channel distribution system (MD), a manufacturer sells the same products/brands to different competing distributors within a certain geographic area. In these kinds of situations, there's a high degree of end-user fragmentation coupled with ongoing demand for products. This means that even though these distributors are competitors, each distributor's precise geographic location works to its advantage. Usually, the products are relatively low-tech and either they've already been specified for end-users or else end-users are already familiar with them.

Figure 9.19 provides a schematic representation of this type of distribution. Here, the supplier (S) has contracted several different distributors within the same geographic area. Sometimes, these distributors only represent a few products, lines or categories, and other times they represent several (one or more product lines). Usually, these products are sold for various applications.

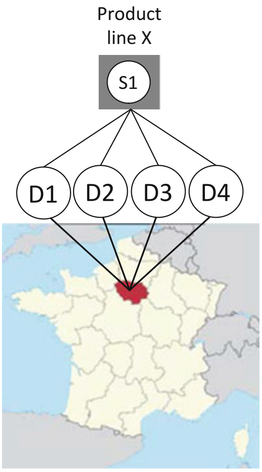


Fig. 9.19 This diagram shows the standard manufacturer-distributor-market configuration for multi-channel distribution. In this case, a single supplier (S) is shown in the upper part of the diagram. The supplier sells its products (in this case, a line of products) to various distributors, all of whom work within the same geographic area (D1, D2, Dn; highlighted area). In turn, these distributors sell the products for various market applications (A) or within a specific industrial sector (e.g. construction)

Once the product has been specified for end-users, this type of distribution allows end-users to access the product quickly or to plan their purchases in advance. Products distributed via multi-channel distribution can have many, varied market applications. So, although each distributor may only sell a small volume of any particular product design, the sheer number of applications guarantees an attractive total sales volume (making it worthwhile for the manufacturer).

If a manufacturer's products are standardized, mature, or relatively low-tech, then multi-channel distribution can help make its products widely available to highly fragmented end-users. Moreover, these distributors can function as a "one stop" shop, offering the kind of complementary products that end-users need. Naturally, since the manufacturer will have contracted several different distributors within the same geographic zone, it's not as critical if one of these relationships doesn't work out.

The disadvantages of multi-channel distribution stem from the fact that distributors won't be motivated to promote any particular brand, unless the sales terms make it beneficial to do so. In multi-channel distribution, distributors frequently represent similar products from competing manufacturers.

Given that there are several distributors for any one product and multiple distribution centers, the logistics of multi-channel distribution are much more complex. As a result, a manufacturer should assign certain personnel to handle sales, marketing, and logistics. Yet, when compared to the alternative, administrative complexity is the lesser evil; otherwise, the manufacturer would be forced to deal directly with an incredibly fragmented market.

The advantages and disadvantages of multi-channel distribution are summarized in Fig. 9.20.

Advantages	Disadvantages
MD facilitates a fast and broad access to the market of interest. This favors reaching a wider variety of customers	MD tends to be less specialized in products and services
MD can supply complementary products and services to the main product offered by a manufacturer	MDs are usually less motivated to actively promote the offer relative to a regional exclusive distributor
One multiple distributor is more easily replaceable than other types of distribution	MDs frequently work with several manufacturer brands at once
	MD will frequently promote the manufacturer brand that negotiates better conditions for them

Fig. 9.20 A summary of the advantages and disadvantages of multi-channel distribution (MD)

In multi-channel distribution, a distributor can increase its bargaining power by developing a strong customer base within the geographic zone. This means that a distributor will need to spend time and resources expanding its technical knowledge and developing services that increase user satisfaction (e.g. a return policy, a good demand forecasting system, etc.). A manufacturer can increase its negotiation (or renegotiation!) power by making products easily available, ensuring that its (product) brand has a good reputation amongst end-users, and, naturally, by providing distributors with a relatively liberal credit system.

Figure 9.21 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

When should a manufacturer use multi-channel distribution?

Multi-channel distribution is a good option for manufacturers whose products are widely used in a huge variety of applications. Because these products are so universal, they're not as specialized and end-users are already familiar with them. Of course, these products will need to be storable and standardized, making it easier to identify and classify them throughout the industrial chain.

This type of distribution is good for reaching highly fragmented end-users in large industrial metropolitan areas.

For manufacturers that produce and commercialize products that comply with the above conditions, multi-channel distribution allows them to penetrate new markets more quickly.

However, when it comes to introducing new products, multi-channel distribution is not the best option. Since these distributors represent other products and industrial brands, their attention and interests will be focused elsewhere.

Parallel Industrial Distribution

In a parallel distribution system (PD), a manufacturer contracts two different distributors within the same geographic area and puts each one in charge of a separate product line. These distributors are trained to sell a specialized product for a particular market application. Even though these two (or more!) distributors are located in the same area, they each have exclusive representation of a single product line.

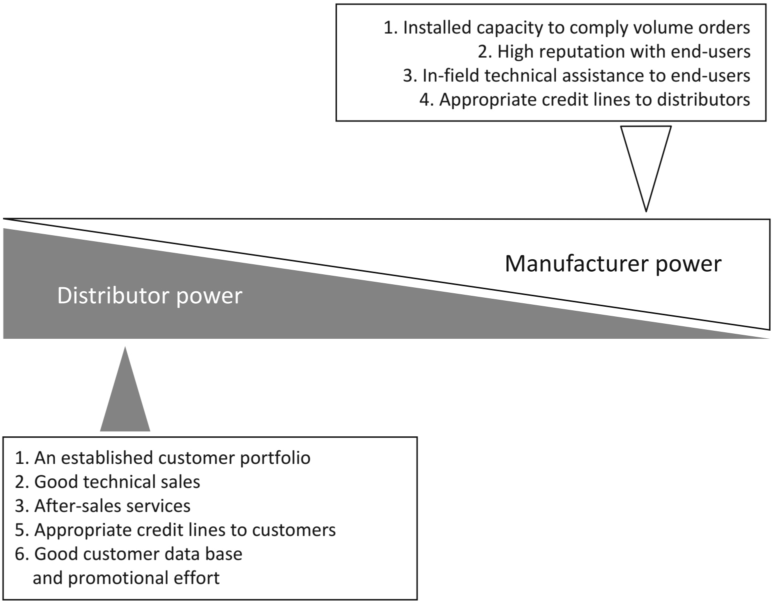


Fig. 9.21 This diagram illustrates the balance of power and mutual dependency between a manufacturer and a distributor in a multi-channel distribution system. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

In this regard, at least one of these distributors should be an application specialist.

Figure 9.22 provides a schematic representation of this type of distribution. Here, the supplier (S) has contracted two different distributors (D1 and D2) within the same geographic area. Each distributor is responsible for selling a specialized product for a particular market application.

These distributors don't have to compete with one another. After all, each of them represents a different product line designed for a different market application.

The purpose of this type of distribution (which, at first glance, may seem fairly cumbersome) is that it works well for manufacturers that produce two very different lines of technical products (e.g. medical products and industrial products). For the manufacturer, this is an effective way to commercialize both product lines within the same geographic zone.

If one of these distributors specializes in a particular application, then it effectively provides the same kind of advantages that an Application Specialist Distributor would (see ASD above). As for the second distributor, the manufacturer will decide who to contract on a case by case basis, depending on each distributor's characteristics.

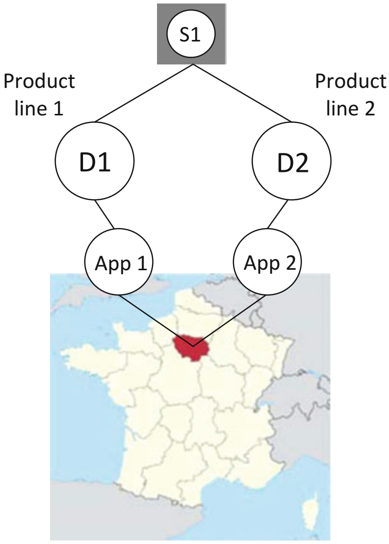


Fig. 9.22 This diagram shows the standard manufacturer-distributor-market configuration for parallel distribution. In this case, a single supplier (S) is shown in the upper part of the diagram. The supplier sells its products (in this example, two different product lines) to two different distributors (D1, D2) in the same geographic area. Each of these product lines is designed for a specific market application (A1, A2). Even though they're located in the same area, these distributors don't compete with one another

Compared to generalist distribution, parallel distribution is undoubtedly more complex—both logistically and administratively. Yet, assuming that progressive manufacturers want to provide better customer service (and their product lines serve very different purposes), then generalist distribution isn't good enough. These manufacturers will want to find more specialized distributors: either distributors that specialize in particular applications, or distributors that possess a higher degree of technical knowledge that they can use to educate end-users.

Unfortunately, it's not always possible to find *two* ideal distributors; that is, two distributors that specialize in the right applications and that work within a single geographic area. In that case, a manufacturer should contract at least one application specialist distributor. And, for the second product line, the manufacturer can choose the next best candidate.

One disadvantage to this model is that distributors might not consent to an exclusive representation agreement. Oftentimes, distributors that specialize in a particular application will buy and sell products from competing brands.

The advantages and disadvantages of parallel distribution are summarized in Fig. 9.23.

Parallel distributors should have competences similar to those of an ASD. Meanwhile, the manufacturers' bargaining power hinges on the quality of its products (functionality and attributes), and its product's reputation amongst target application customers.

Advantages	Disadvantages
PD (as a channel design) serves different applications in a given geography	Due to its high application specificity, PD frequently works with several manufacturer brands at once
PD has a higher degree of product and service specialization	PD (as a channel design) is not frequently available for hiring
PD usually facilitates a better application or niche penetration for specialized products	Distributor and manufacturer brand power are similar to those of exclusive distribution

Fig. 9.23 A summary of the advantages and disadvantages of parallel distribution (PD)

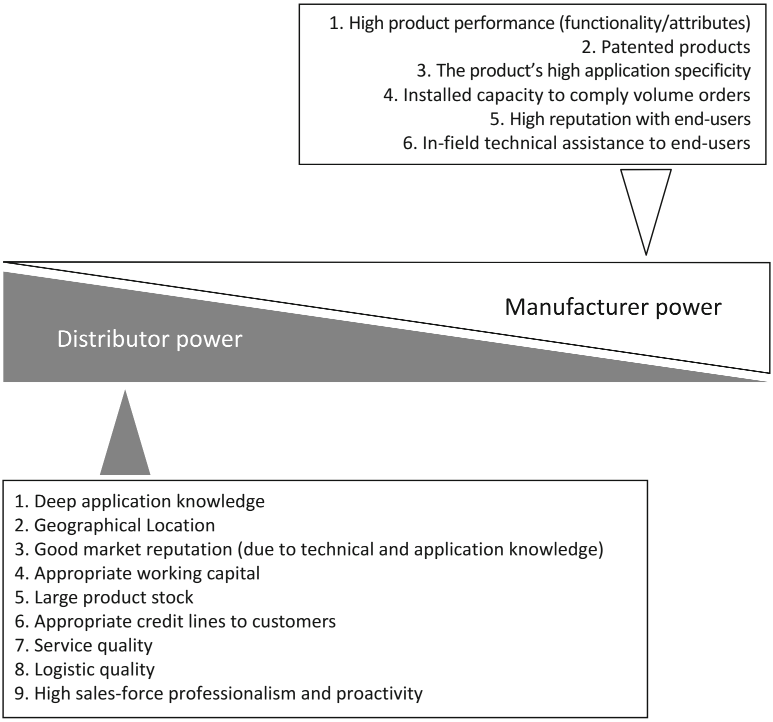


Fig. 9.24 This diagram illustrates the balance of power and mutual dependency between a manufacturer and parallel distributors. Each side of the diagram lists the various competencies that manufacturer and distributor need to have. So long as these competencies are present or are highly developed, they can tilt the balance of power one way or another. This power determines each sides' ability to negotiate (or with time, renegotiate) more favorable conditions

Figure 9.24 shows the balance of power between manufacturer and distributor. The presence of any one of these variables can increase the mutual dependency between manufacturer and distributor, and can increase the relative power, or bargaining power, of one side or the other.

When should a manufacturer use parallel distribution?

Parallel distribution is a good option when:

(a) A manufacturer has two very different product lines. Each product line is specifically designed for a particular market application.
(b) These products have sophisticated and technically complex designs.
(c) The manufacturer is constantly developing and introducing new products for at least one of these product lines.

Selling and Distributing Technical Products Over the Internet

When appropriate, some companies can use e-commerce websites to distribute their products online. Websites feature multiple product lines and the products are sold using a ship-to-order method. Distributors do the behind-the-scenes work: responding to consultation requests, receiving purchase orders and payments, and shipping the product to the end-user.

This section is directed at industrial manufacturers that want to use e-commerce as a way to reach end-users. It will not discuss the fact that e-commerce is also used as a purchasing platform by resellers or customer hubs (this refers to whole industries that come together to form a purchasing association).

Industrial e-commerce can be thought of as:

– An online purchasing platform where end-users can buy standard/routine industrial products. Some companies, for example, manage to save up to 15 % of their normal purchasing costs by expanding their e-commerce operations.
– An online catalog that's constantly being updated. It's far cheaper to list and promote simple products online. However, for the time being, e-commerce websites aren't an appropriate format for introducing new, complex technical products.
– A public source of information. E-commerce allows people to compare prices and product specifications.

E-commerce distribution companies tend to represent a huge number of manufacturers and promote hundreds, or even thousands, of different products. These products are not very technically complex and end-users will know what kind of specifications, design, product type, and performance to look for.

In the United States, these products are generally known as MRO products (however, in contrast to the above, an MRO product mix can sometimes include more complex products). For example, Grainger, Inc. (www.grainger.com) is a well-known company that distributes MRO products online. There's also Digi-Key Corp (www.digikey.com), which is another e-commerce distribution company that specializes in electronic components.

Generally, these online catalogs provide a reference price, a volume discount price, and they show how many product units are currently in stock.

With the above in mind, it's possible to distinguish between e-commerce distribution companies and manufacturers that promote and sell some of their products online.

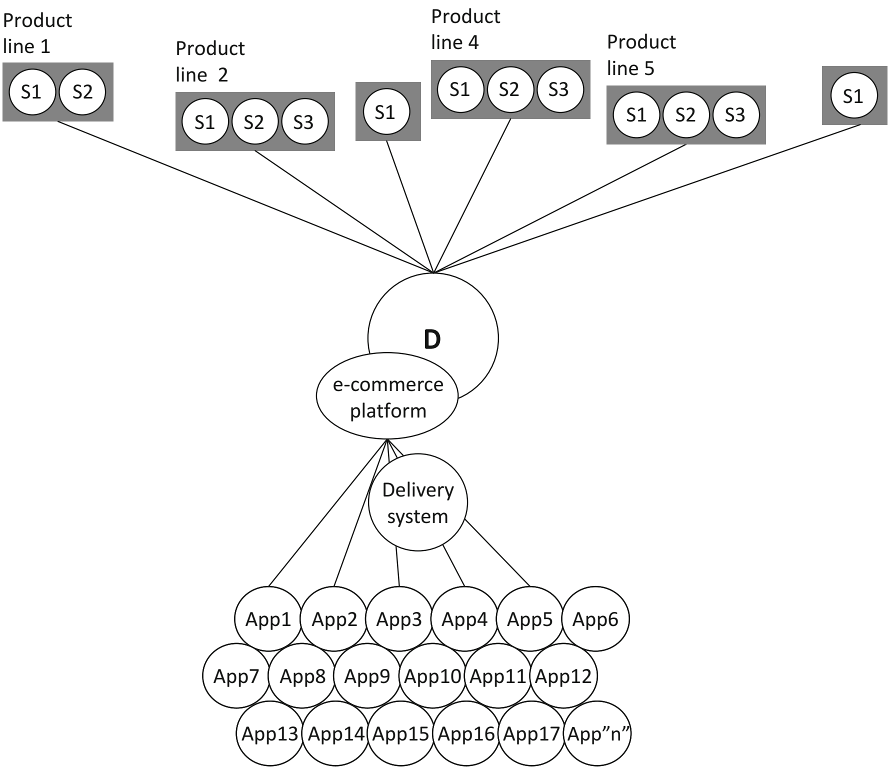


Fig. 9.25 This diagram shows the standard manufacturer-distributor-market configuration for e-commerce distribution. Suppliers (S) and their product lines are shown in the upper part of the diagram. Once a customer puts in their purchase order, the distributor (D) contacts the manufacturer's warehouse. Then, the distributor works with an express shipping company to organize distribution logistics. As the reader can observe from the diagram, e-commerce distribution isn't limited to any particular geographic area, nor does the distributor specialize in any particular application. Since the distributor doesn't actually stock products, this kind of distribution is often called 'pure click'. In contrast, there are some manufacturers that promote and sell their products directly over the Internet

Figure 9.25 provides a schematic representation of this type of distribution. Here, an e-commerce distribution company (D) has been contracted by numerous different suppliers (S). Customers from different applications (A) can use the website to contact the distributor, ask questions, review design specifications, look up prices, and order products. Once a purchase order goes through, the distributor (D) contacts the manufacturer's warehouse and arranges product delivery using an express shipping company.

Arguably, an e-commerce website is a replacement for an industrial distributor's sales force. One advantage to online sales is that it allows distributors to create sophisticated databases on customer purchasing habits. As customers use the website, they start to develop a purchasing behavior profile. This type of information is useful for planning future offers, promotions, and cross-sales. In other words, a good website involves sophisticated CRM.

When should a manufacturer use e-commerce distribution?

Some authors argue that it's taken a surprisingly long time for industrial companies to start distributing their products over the Internet. The main reason for this has to do with a dominant trend in industrial markets: that is, that technical products are becoming increasingly complex, multidisciplinary, and specialized. Moreover, product usage conditions (applications) are constantly changing and expanding; and, quite often, it takes more than superficial market research to foresee these changes. Not to mention, proper pricing often depends on each customer's particular circumstances.

As discussed previously (see Chap. 8), an industrial customer needs to go through an iterative process with the supplier before adopting a complex technical product. There's a lot of variables to consider and the entire process requires everyone's collaboration and creativity. Oftentimes, companies have to hold intense meetings at one another's facilities before they're able to resolve some minor specification. Thus, even in today's world, there's still no replacement for face-to-face meetings between a manufacturer's and a customer's teams of technical professionals.

As a result, online product distribution is currently limited to products whose specifications, performance, and usage are already familiar to customers. For customers to be familiar with the product and its usage means that the product is already mature and isn't very technically complex. Moreover, the product also needs to be relatively versatile, especially when compared to product lines that require on-site consultations in order to be properly specified. Figure 9.26 provides some classic examples of common industrial products that are distributed online.

In addition to the above product characteristics, e-commerce distribution applies to situations in which:

– Manufacturers need to penetrate global markets that they have yet to reach through traditional distribution channels.
– Manufacturers have a weak global distribution system for spare and replacement parts. This can hurt their sales of new equipment.
– A manufacturer's contracts and pricing policy are relatively simple (e.g. volume discounts).
– A manufacturer makes standard, commonly bought products whose technical specifications are familiar to target application customers.

With the above in mind, manufacturers should carefully assess which e-commerce distribution company is right for them. There's a positive trend towards websites that specialize in certain products or industrial sectors (e.g. www.digikey.com, www.foxelectricsupply.com). This is especially true for construction, electronics, and electricity. Larger companies, such as AmazonSupply, have a wider range of products that they organize according to product line or business units.

Fig. 9.26 Pictures of modern-day industrial products that are commonly distributed online. All of these products are standardized, storable, mature, and are easily identifiable by end-users. Buying one of these products implies that the customer knows what they need and knows which product specifications to look for

Direct Distribution Through Company-Owned Distribution Centers

In direct distribution (DD), a manufacturer sets up its own distribution centers and distributes its products directly to customers. In this case, the manufacturer is responsible for designing, building, operating, and administrating its own distribution facilities in different geographic locations. As such, the manufacturer doesn't contract another company to commercialize its products—rather, the manufacturer takes on the role of an independent distributor.

Figure 9.27 provides a schematic representation of this type of distribution. Here, the manufacturer operates two different distribution centers, or branch offices (B1 and B2), each of which provides products for different types of applications (A). Each office stores and commercializes whichever product lines are assigned to them by the company's headquarters.

There are several advantages to direct distribution, such as: it allows a company to provide more specialized products/services that better meet end-users' needs, the company gains direct, quality information about factors that influence customers' purchasing decisions, and it makes it easy for a company to effectively promote its product mix. Conversely a third party distributor (assuming, of course, that one exists within the specified area) wouldn't necessarily be able to provide these advantages. Not to mention, branch offices are more apt to have a trained and dedicated sales force that will visit customers in the field.

The disadvantages of this type of distribution include: the amount of money a company needs to invest in infrastructure, the fixed costs of operating and administrating branch offices, and a greater degree of systemic complexity (which the

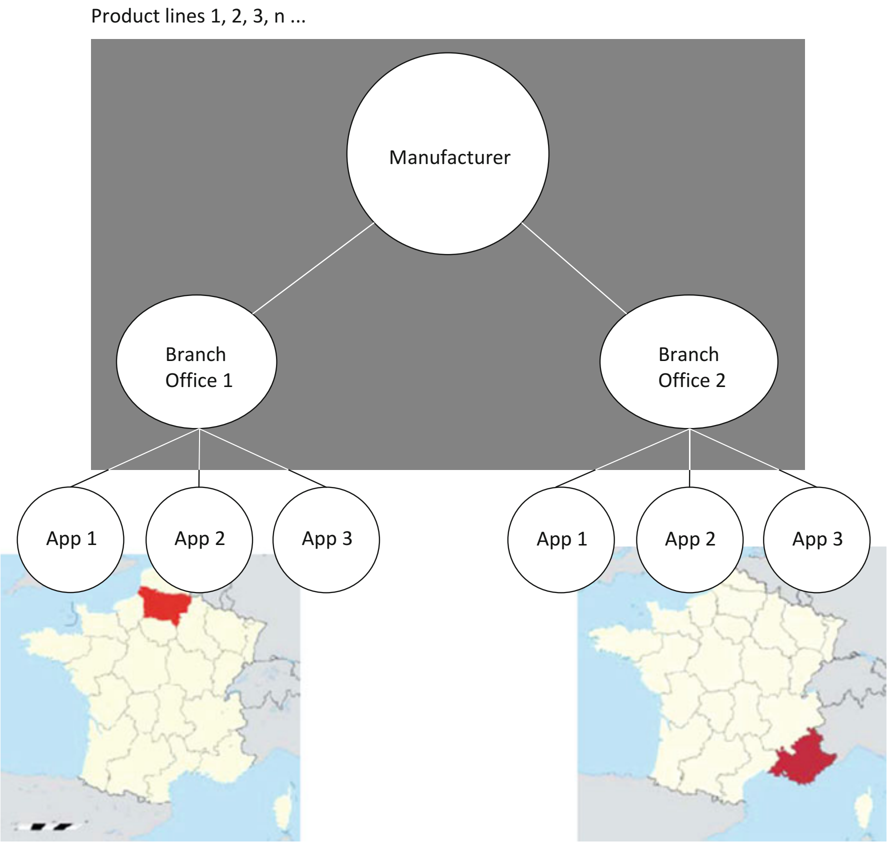


Fig. 9.27 This diagram shows the standard manufacturer-distributor-market configuration for direct distribution. The manufacturer dispatches products (or, in this case, several product lines) to two company-owned distribution centers, or branch offices (Branch 1 and 2). In turn, each branch office sells its product lines for one or more applications within its zone of influence

manufacturer is responsible for). Also, there's always the risk that a branch office will develop an organizational culture different from the central office—this can undermine the whole purpose of direct distribution.

Also, the manufacturer should realize that other regional distributors (assuming they exist) may feel resentful about having to compete against the manufacturer's branch offices.

The advantages and disadvantages of this type of distribution model are shown in Fig. 9.28.

When should a manufacturer opt for direct distribution?

Direct distribution is a good option when:

(a) A manufacturer wants to participate in a rapidly growing market but doesn't want to sacrifice its profits to distributors. For instance, if manufacturers have

Advantages	Disadvantages
DD has a higher degree of product and service specialization. It is easier to introduce new products through a DD	DD is expensive: fixed costs, initial investment and stock.
DD can supply their customers with MRO services such as on-site or near-by maintenance and repairs	DD increases systemic complexity for the manufacturer: management of personnel, branch culture, procedures and systems
DD will supply better market feedback about customers and trends	DD is more risky in term of opening credit lines to smaller and fragmented customers
Technical assistance to customers and proper specification design tend to be more profound with DD	DD is less compatible with other distributors to be hired in the the geography of influence
No commission or discounts to third party distributors	
Better control over communication and pricing to user customers	

Fig. 9.28 A summary of the advantages and disadvantages of direct distribution (DD)

been very successful in certain markets, they'll probably want to develop a significant market share in new, fast-growing markets. Besides, there may not be a third-party distributor in the area that can offer the manufacturer a significant market share over time.

(b) None of the regional distributors or distribution systems provide the kind of product mix, services, consultations, or feedback that end-users need. A disconnect between an existing distribution system and a manufacturer's ideal distribution system can manifest itself on a number of different levels: a distributor might not possess sufficient technical knowledge, they might employ the wrong type of personnel, they may lack sufficient solvency, or they could have inadequate infrastructure, and poor operational processes and information systems, etc.

(c) Regional distributors force manufacturers to compete with another. That way, the distributor can choose whichever manufacturer offers them more favorable conditions.

(d) There simply isn't a single regional distribution company that would be able to distribute the manufacturer's products.

(e) A manufacturer needs to move quickly in order to penetrate a new market. The manufacturer doesn't have time to develop a PSD, ASD, or both.

All of these problems can exist in varying degrees of intensity. Yet, in and of themselves, they don't necessarily tip the scales in favor of direct distribution. Before opting for direct distribution, a manufacturer should assess whether they have the administrative and logistics skills, and financial wherewithal to take on this kind of enterprise.

Distributing Industrial Products/Services Through Franchises

Franchising is a distribution model in which a manufacturer provides a distributor with rights to its trademark, a standardized operational protocol, and a key product (one that plays an essential role in the final offer). In return, the distributor agrees to follow the protocol and pay ongoing royalties to the manufacturer.

In some ways, franchising is similar to exclusive distribution in the sense that the distributor's products and procedures are a 'cloned' from the manufacturer's. Or, it can be likened to a partnership between a manufacturer's branch office and a third party administrator. In order to preserve the partnership, the administrator has to follow the protocol.

Industrial manufacturers have yet to explore the full potential of franchising. The main reason that industrial franchises are scarce is because franchising requires certain conditions to be met:

(a) It requires a highly reputable brand that can guarantee its customers a certain level of product/service performance.
(b) The manufacturing and administrative processes need to be unique, standardized, and identifiable. Moreover, the product design should be difficult to replicate, or legally protected. These types of manufacturing and administrative processes ensure that customers receive a high quality product/service on par with the brand's reputation.
(c) The manufacturer's physical product needs to play a central role in the final product/service mix that franchisees offer to end-users. Moreover, this product should provide outstanding performance and its design or formulation should be protected under intellectual property law.
(d) Initially, the franchisee will need to invest in infrastructure, equipment, personnel and systems. And, for the length of the contract, they'll need to pay the manufacturer a percentage of their sales.
(e) The franchisor needs to provide the operational protocol, train the franchisee's personnel, and sell the main product, all with excellent logistics.

As for the first point, industrial brand reputation is very different from consumer market brand reputation. In consumer markets, there are powerful psychological phenomena at play, causing customers to get attached to a given brand. This attachment is somewhat like an 'emotional patent' on a brand concept, and its made some retailers very successful.

Without this 'emotional patent', imitators can easily reproduce the product/service design, its manufacturing process, and its marketing and sales. An industrial franchisee can quickly learn this kind of information and make off with all of the new customers. Yet, that being said, industrial franchises do exist and, on occasion, they have proven to be intelligent business models that work well in fast-growing markets.

Figure 9.29 provides a schematic representation of franchise distribution. In this case, the manufacturer has licensed two franchises, each of which sells the product/service mix for different applications. In addition to delivering the actual product, each franchise has to follow a unique and outstanding set of operational protocols.

The advantages of franchise distribution (as opposed to simple distribution) is that in franchising, the user receives much more than just a physical product. There's an entire backdrop of standardized operations and services that the user receives as well. This type of business model is welcomed and embraced by customers. What's

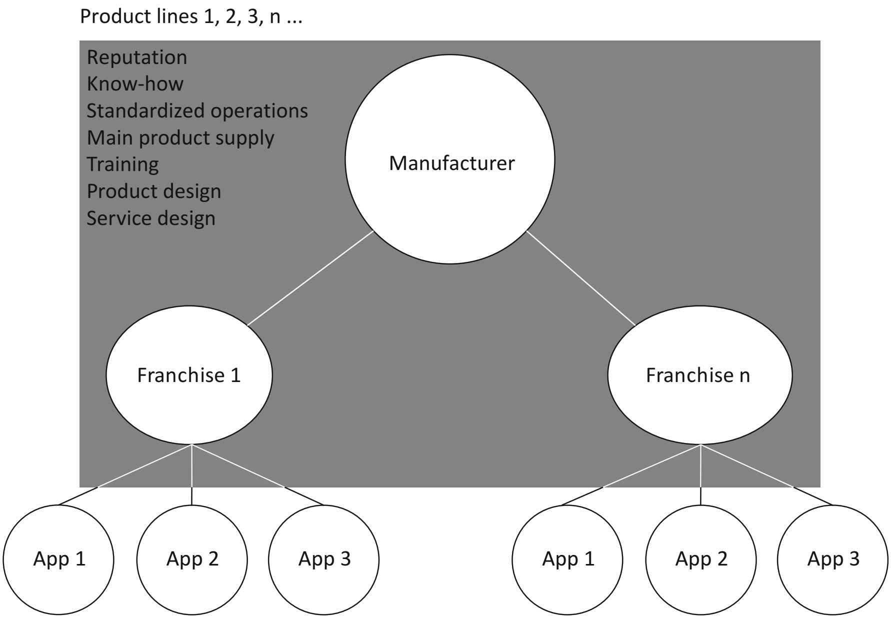


Fig. 9.29 This diagram shows the standard manufacturer-distributor-market configuration for franchise distribution. In this case, a single manufacturer (Manufacturer) is shown in the upper part of the diagram. The manufacturer licenses their trademark to two franchises (franchises 1 and 2) and supplies each one with a complex, standardized offering that provides outstanding performance. In turn, each franchise sells a standard product/service mix for different applications within its zone of influence

more, franchising is fairly inexpensive for the manufacturer. In fact, franchisees are the ones that have to invest in infrastructure, personnel, and systems, and provide enough working capital to start and maintain the business. Quite often, franchisees are even charged an initial fee to use the manufacturer's trademark. Of course, as mentioned earlier, the manufacturer's brand has to be successful and highly reputable.

The disadvantages of industrial franchise distribution are that it puts a product at risk of being imitated: and not just the product itself, but also how it's manufactured, marketed, and sold. Without the emotional appeal that consumer market franchise brands have, less than honest industrial franchisees might argue that they've 'improved the business' and subsequently stake claim to the product/service originally designed by the manufacturer. Franchisees could decide to launch their own brand, regardless of whatever legal restrictions were included in the original contract.

A further disadvantage to this model is that franchisees typically seem to embody the archetype of an 'independent entrepreneur'. They have their own unique personality and business culture. As a result, a manufacturer should take into account possible differences in business culture when deciding who to partner with.

Advantages	Disadvantages
A franchise model has the potential to penetrate a market very fast	The franchiser obtains only a commission from the total sales of a franchise
Franchising has a low distribution cost in comparison with other models	Manufacturers have to learn how to work with franchises that have a very different business culture
Franchising means that the procedures, the product and the services are highly standardized according to the manufacturer's specifications	An escalating conflict between manufacturer and franchisee can easily end in court
A franchise has a higher degree of product and service specialization relative to other distribution models	There is a higher probability that the product/service mix be copied by unscrupulous franchisees
	The final product/service quality must be constantly observed by the manufacturer. Permanent training is a must.

Fig. 9.30 A summary of the advantages and disadvantages of franchise distribution

The advantages and disadvantages of franchise distribution are summarized in Fig. 9.30.

When should a manufacturer opt for franchise distribution?

Franchise distribution makes sense in situations where it's important for a manufacturer to penetrate a market quickly, but where the manufacturer doesn't have the resources to invest in new branch offices. However, any manufacturer that wants to set up franchises must first meet the requirements listed at the beginning of this section [points (a)–(e)].

Why would it be important for a company to quickly establish a presence in a new market? Manufacturers with insufficient capital might feel pressure from other competitors. Consequently, they might try to significantly increase their sales volume in order to achieve economies of scale. In this scenario, a manufacturer can achieve a dominant market position by quickly establishing itself in a new market or application, having a renowned product or service, and by being the first one to properly respond to customers' needs.

Important Things to Consider When Designing an Industrial Distribution Channel

In practice, a manufacturer's enthusiasm and anxiety about entering a new market can get in the way of choosing a suitable distributor. The reason this volume has devoted time and space to discussing and describing industrial distribution models is that choosing the right distribution model for a given geographic area is extremely important. In fact, this kind of decision can make the difference between commercial success or failure in a given region.

To begin with, manufacturers shouldn't be surprised if distribution companies aren't aware of their own distribution model (the exception to this are distribution models that are more easily identifiable, e.g. exclusive or generalist distribution, etc.). As such, there's no point in asking distribution companies whether they consider themselves to be product, technology, or application specialists, or parallel distributors, etc. Of course, from a strategic point of view, distribution companies should work on developing a clear understanding of their own business model.

There are certain products and product application variables that can help a manufacturer determine which distribution model is right for them.

Below, the reader will find a description of four important product/application characteristics. An industrial manufacturer should consider each of these variables when designing its distribution channel:

1. Technical complexity of the product (low/high): this should be assessed in relative terms. A product's technical complexity should be compared to other products/substitutes that are currently on the market.
2. The degree to which a product is specialized for its target application (low/high): a product might be designed for a specific application, or it might be designed for several different market applications.
3. Product life-cycle stage (new/mature): for simplicity's sake, this assessment has reduced the total number of stages (four) down to two. These two stages are new product introduction, and product maturity.
4. The need for MRO after-sales services (low/high): this is a measure of how much after-sales support a product requires in order to function properly in a given market application.

A manufacturer can use these four characteristics to assess the suitability of different types of distribution models. The table in Fig. 9.31 shows which industrial distribution models are most suitable for different product characteristics.

Some cells in Fig. 9.31 contain the word 'unsuitable'. This indicates that a given distribution model is incompatible with certain product characteristics (hence, a manufacturer is advised against using it). If a manufacturer designs and implements a distribution system that's considered 'unsuitable', they put themselves, the end-user and the distributor at risk.

'Neutral' indicates that a manufacturer is free to use that particular distribution system. In this case, however, the manufacturer should realize that the distributor isn't going to prioritize its product(s). This means that if the manufacturer wants to increase its sales performance, it will need to carry out its own promotional activities to end-users.

'Suitable' indicates that a given distribution model is appropriate for the stated product characteristics. Or, in other words, the distribution model matches the product characteristics.

'Ideal' means that the pairing between the distributor and manufacturer is the best option. In this situation, there's a synergy between the product and the distributor that benefits the manufacturer, distributor, and end-user.

'To be determined' indicates that the distribution model may be right for a given situation, but that it depends on the characteristics of the distribution company. Take, for example, a product that is highly specialized for a particular application. In this case, a technology specialist distributor could potentially be suitable, but

	Technical complexity		Application specialization		Life Cycle Stage		MRO after-sales needs	
	Low	High	Low	High	New	Mature	Low	High
Direct distribution	Indifferent	Best	Indifferent	Adequate	Best	Indifferent	Indifferent	Best
Product specialist	Indifferent	Best	Indifferent	Adequate	Adequate	Indifferent	Indifferent	Adequate
Application specialist	Indifferent	Adequate	Not adequate	Best	Adequate	Indifferent	Indifferent	Adequate
Technology specialist	Indifferent	Adequate	Indifferent	Evaluate	Adequate	Indifferent	Indifferent	Best
Parallel distribution	Indifferent	Adequate	Not adequate	Best	Adequate	Indifferent	Indifferent	Adequate
Exclusive distribution	Indifferent	Best	Indifferent	Adequate	Best	Indifferent	Indifferent	Best
Multiple distribution	Adequate	Evaluate	Adequate	Not adequate	Evaluate	Adequate	Adequate	Not adequate
Generalist distribution	Adequate	Not adequate	Adequate	Not adequate	Evaluate	Adequate	Adequate	Not adequate
On-line distribution	Adequate	Not adequate	Adequate	Not adequate	Not adequate	Adequate	Adequate	Not adequate

Fig. 9.31 Table showing the suitability between product characteristics and different types of industrial distributors. The columns list the four types of industrial product characteristics (described above), and the rows list the ten different types of industrial distribution models. Product/distribution suitability is categorized as follows: 'ideal', 'suitable', 'neutral', 'unsuitable', or 'to be determined' (indicating that it requires further assessment)

only so long as it is also an application specialist. Or, for instance, generalist distribution might work for a new product, but only so long as the new product is relatively low-tech and has a variety of applications.

One of the most frustrating challenges for a manufacturer is when there simply isn't an appropriate distributor in the target area. In practice, this happens quite often. When it does, manufacturers have to adapt and determine the next best option.

Take, for example, the two manufacturing rivals, Caterpillar and Komatsu. Both of these companies manufacture equipment for the construction and mining industries. When these companies decided to insert themselves into China's fast growing market (at the beginning of the twenty-first century), they had to make some adjustments. Caterpillar chose to develop distributors with impressive technical and financial skills. In doing so, they were emulating a strategy that had worked for them before, one that had allowed them to enter various international markets (using distributors such as Finning, for instance). On the other hand, Komatsu chose to invest significant resources in developing a direct, local presence. Komatsu complemented this with support from other regional distributors that, while less-developed, maintained close relationships with end-users.[4,5]

The case of Caterpillar and Komatsu is a telling example of competition between two industrial giants. Their distribution strategies, however, don't fully account for their success or failure in new markets. Like the majority of real-life cases, success or failure depends on other circumstances and strategic factors, such as: the acquisition of smaller companies, ongoing product development, Chinese competitors that offer low-cost products, end-users with different attitudes towards their products, periods of economic growth and decline, etc.

For those who expect a simple, successful, and clear-cut business model, this kind of complexity can be exasperating. Yet, there's nothing new about it. It's been common knowledge amongst businessmen and women for thousands of years. Indeed, this is precisely what we see at the shipwreck in Uluburun.

[4] Komatsu's Business Model through the Product Lifecycle. Yoichi Matsumoto. Discussion paper series. RIEB. Kobe University. Marzo, 2011.

[5] Research into the Distribution Channel of Caterpillar Inc. in the Chinese Market. Qixin Wang. Master Thesis. Delft University of Technology Harbin Institute of Technology. 2009.

Industrial Branding 10

Introduction

In Ancient Egypt—just as in Ancient Greece or Rome—merchants had to find a way to market their goods to a mostly illiterate marketplace. To do so, they hung up papyri with symbols of the goods they were selling and decorated their storefronts with recognizable images. This was especially helpful for identifying shops that belonged to more established merchants. Later on, during the Middle Ages, these techniques and symbols were used by manor houses or fiefdoms as a means to identify, or brand, themselves. The purpose behind this branding is similar to the purpose behind modern-day branding: to identify something and/or promote it.

History is full of examples of branding and its many components: Lancaster versus York, Montague versus Capulet, Christianity versus Islam, Flanders versus Gobelins (both of which are major centers of tapestry production), etc.

Or, to give some industrial examples, the white limestone blocks that came from quarries in Tura, or the granite blocks that came from Aswan, were among the most prized by builders and architects in Ancient Egypt. Likewise, iron tools were worth more than their weight in gold, and the makers of these tools could achieve true celebrity.

As the twentieth century progressed, the industrial revolution took a definitive foothold, and competitive markets began to emerge, people began to take a closer look at the phenomenon known as ‘branding’. They were especially interested in branding from a consumer market perspective. These days, the marketing literature on branding seems to be saturated with an excess of terms: brand ‘essence’, brand ‘extension’, brand ‘relationships’, brand ‘relevance’, brand ’awareness’, ‘brand legacy’, etc. Some books mention over 50 different branding terms, many of which are not even explained.

This metaphysical approach to branding attempts to convince consumers that they’re receiving additional benefits besides those the product actually provides. This might work well in a consumer market context, but, for numerous reasons,

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INDUSTRIAL BRANDING	CONSUMER MARKETING BRANDING
The brand itself does not de-commoditize the offer	The brand itself can de-commoditize the offer
The product/service must first be tried and evaluated by the customer. Only then, an "offer-brand association" is made	The brand often delivers information to the market before a customer can experience tangible benefits
Poor performance of the product/service immediately harms the brand	Product performance is often subjective (psychological). Branding techniques can influence this perception
In most cases the brand is not an asset that has value in itself. It is a consequence of delivering consistent and measurable performance	The brand as an asset can be managed because often times it has value in itself (identity of the word itself)
The brand has less emotional associations and more technical and risk associations	The brand has more emotional associations (the "brand name" has to be designed accordingly)
Brand elements such as slogans, figures or icons have little or no importance in an industrial context	Brand elements should be designed considering customers' psychological associations (e.g. Nike's "Just do it")

Fig. 10.1 The differences between consumer branding and industrial branding. These differences are due to the psychological nature of consumer markets and, in either case, the degree of market fragmentation (number of customers)

industrial marketers shouldn't waste their time developing a metaphysical branding strategy. The reasons for this will be discussed below.

No doubt, any proper noun of the human language constitutes a type of brand: lion, tree, Beethoven, car, father, etc. 'Branding' is a natural offshoot of the evolution of human language; in fact, arguably, 'branding' is related to our ability to identify, classify, plan, and survive. Through language, humans gain the capacity to refer to things that are not actually present, which, in turn, allows them to anticipate situations and act accordingly.

At heart, language provides us with a guide.

Thus, if someone wants to talk about something, that 'something' already has a brand.

However, there's a huge difference between branding as a form of identification and branding as a form of promotion. This is a good starting point for understanding industrial branding: industrial branding isn't about promoting the brand itself, it's about promoting the performance that's associated with the brand.

There are various types of industrial brands: corporate brand, generic product brand, product brand, product category brand, etc. For better or for worse, industrial branding is a consequence: an industrial supplier promotes the performance of a brand, and the customer subsequently associates that performance with the brand.

The concept of 'branding' has largely been developed from a consumer marketing perspective. So, what follows is a discussion of some of the differences between B2B branding and B2C branding. These differences are shown in the table in Fig. 10.1.

In consumer marketing, 'brand building' is usually thought of as a separate process that runs parallel to product/service performance. It's common knowledge that a many consumer companies employ Brand Managers, and, what's more, executives and academics alike will argue that "a company's brand is its most important asset."

And this might be true for many consumer market companies.

However, for industrial companies, their brand is not their most important asset. Rather, their most important asset is the reputation obtained from product/service performance. This is because an industrial company's brand is closely tied to product/service performance, and, oftentimes, even when customers are not in the process of purchasing a product, they'll be aware of how supplier companies are doing (either well or poorly) in their respective markets.

Industrial brand reputation is a *consequence*. It always is. While some industrial companies are more reputable than others (e.g. Siemens, which was founded in 1847), their reputation is constantly being revised and updated by customer companies. Industrial customers will, for a certain amount of time, *lend* their trust to reputable industrial brands. Yet, if a customer were to experience a significant product malfunction with Siemens products, for instance, and if it became public, then it could seriously elevate the risk that other customers associate with that brand. It's common knowledge that Siemens tests out new products or businesses under different names. Only after these products or businesses prove to be successful does Siemens start promoting them under its corporate brand.

There's an undeniable logic behind this phenomenon: namely, that the customer is a technical customer, or, *a colleague*. There's a lot of risk involved in deciding to buy from a particular industrial supplier. It's not just the considerable purchasing costs or the costs associated with a potential failure; whoever made the purchasing decision, or helped make it, faces scrutiny by other professionals within their organization.

Behind any brand, there's always going to be people with different perceptions of it: there's what the company thinks of itself, and what customers think of the company. These perceptions don't always match up; indeed, customers tend to be much more critical. In an industrial context, a manufacturer can bridge this gap by engineering a product/service with better performance, thus improving what customers think of them.

In a consumer market context, however, and especially in retail, companies deal with this gap differently. They bombard customers with advertising and they redesign their product's presentation and appearance (e.g. they alter its logo, colors, or installation). See Fig. 10.2.

No doubt, there are some interesting examples of consumer markets where customers have had enough technical knowledge to discriminate between different products. In fact, when it comes to making purchases, customers in consumer markets are becoming increasingly technically sophisticated. Regardless, consumer markets are still plagued by trends that favor certain brands over others, even when those brands provide inferior performance. A lot of end-consumers are still happy to accept promotional claims and promises that are unfounded.

All in all, the best way to design and implement industrial branding is to think of the customer as a colleague. A well-informed and demanding colleague. This means that a company should take a professional, responsible and ethical approach to industrial branding. Quite frankly, it's wrong for companies to try to improve customers' perceptions of them through superficial promises or meaningless slogans.

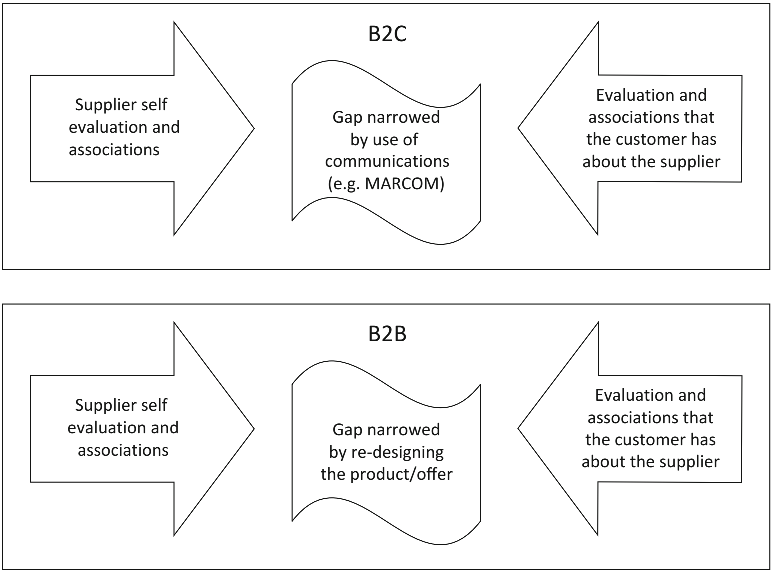

Fig. 10.2 Different methods for bridging the gap between a customer's perception of a brand and the company's. Consumer market companies, and especially retailers, frequently use psychological mechanisms to influence the way customers think about their brand. Conversely, industrial companies respond to this gap by making functional changes in their product/service design

With the above in mind, it's important to point out that industrial brands (corporate brands or product brands) do exist, and these brands can be promoted and managed. Moreover, there are industrial branding tools available that can help support or speed up the introduction of new products, product categories, or services. Before going into detail on these tools, this chapter will discuss various types of industrial brands, some of which can help a company make decisions about its branding strategy.

Different Types of Industrial Brands

There are seven different types of brands that are widely used in industrial markets:

1. Industry brand
2. Corporate brand (the company's brand)
3. Generic product brand
4. Product brand
5. Product category brand
6. Distributor brand (if applicable)
7. Country-of-origin (COO) brand

Industry Brands

An industry brand is a brand that represents an entire industrial sector; in this case, it's a group of companies with similar products that are offered within a common market (e.g. a region, province, country, or even a global market). Examples of industry brands include: steel, rolling bearings, plastics, lubricants, robotics, lighting, etc. Figure 10.3 shows the results of a study carried out by the European Aluminum Association. This study proves that there are several advantages to using aluminum over steel for automotive applications. This is meant to reduce the stigma that aluminum is an expensive metal. This kind of information is often publicized through different media outlets and it helps create positive awareness of a technology.

In the industrial world, some industries are mono-productive, meaning they only produce a certain product/service (e.g. aluminum, petroleum, cellulose). This makes it easy to do mono-branding for the product. This kind of branding is similar to generic product branding, which will be discussed below.

The advantages of developing an *industry brand* are:

(a) It allows companies to work together (and form business associations) in order to defend their product against, for instance, substitute industries.
(b) It's a way to promote a product's characteristics and reputation to regulators (e.g. political lobbyists, legislators, regulatory agencies).
(c) It neutralizes pressure groups that are campaigning against the industry (environmental advocacy groups, anti-capitalist groups, anti-systemic groups, etc.).
(d) It's a way to promote the industry's (or product's) characteristics to influential groups or organizations (universities, institutes, specifiers, charities, etc.).
(e) It's a way to promote the industry to talented job-seekers.

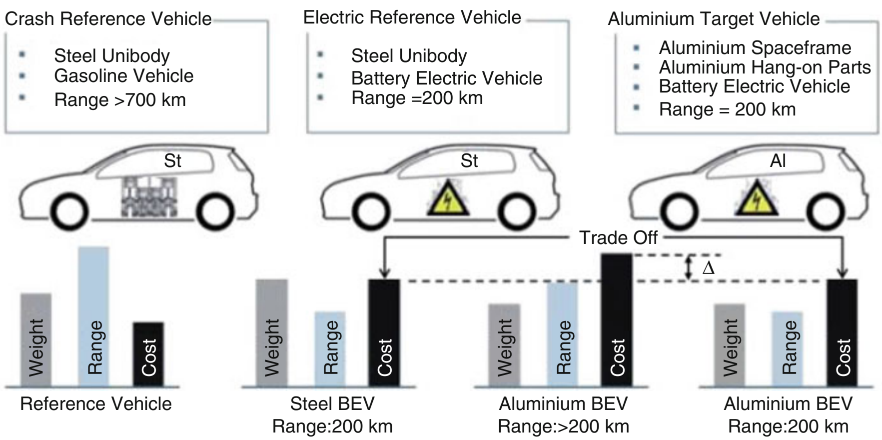

Fig. 10.3 From a study conducted by Forschungsgesellschaft Kraftfahrwesen for the European Aluminum Association and the International Aluminum Institute. Although aluminum initially costs more than steel, this study shows that it can actually be less expensive to use an electric car (BEV) mostly out of aluminum

Usually, an *industry brand* is managed either by a business association, a technical organization associated with the industry or, failing these, by a leading company within the industry.

Corporate Brands

A corporate brand is the name of whichever company manufactures/sells/distributes the products and services being offered. This is the most common form of industrial branding, and it often goes hand in hand with a generic product brand or a divisional brand. This is shown in Fig. 10.4.

Corporate brands are meant for:

(a) Established companies that have a history of producing outstanding products. These companies have a reputation that sets them apart from their competitors and, as discussed above, industrial customers trust them (for a while, at least). Because of this trust, it's easier for these companies to, say, introduce new products than it would be for a competitor.
(b) High volume and/or risky business projects. Since industrial projects often involve large volumes or a lot of financial/operational risk, it's important for a customer's decision makers to understand which company is supplying the product or service. Once again, a company's reputation is developed over time, through products or services that demonstrate a high level of performance.
(c) Products that have short life-cycles. Good branding is expensive, thus, an individual product brand isn't suitable for products with short life-cycles.
(d) The new product should have distinguishing characteristics in its design, composition, or both.

There are advantages and disadvantages to pursuing a corporate brand. For example, it's easier and faster for reputable companies to introduce new products into diverse markets. A corporate brand can also be 'extended' to other products or businesses to help them gain credibility. Not to mention, corporate branding uses a single brand for multiple products or types of products, so ultimately, it's less expensive.

As for the disadvantages of corporate branding, it only takes one or more customers to experience a one-time performance issue and the entire company's reputation can suffer as a result. Thus, a single defective product or service can discredit the rest of a company's products. Additionally, corporate brands have their limits: companies should be careful about attaching their corporate brand to an unrelated business (otherwise, they risk being seen as a generalist supplier).

SIEMENS
medical

Fig. 10.4 Siemens' corporate brand is shown alongside its divisional brand (medical products). As discussed in the text, it takes a long time to develop a reputable corporate brand. To do so, a company needs to build up a 'résumé' of high-performing products and services

Generic Product Brands

This is the technical or descriptive term that industry professionals and customers use to refer to a product. For instance: steel rebars, robotic arms, oil-free air compressors, gas ball valves, etc.

In order to distinguish between different versions of a product or different product designs, the generic product brand is often followed by initials, numbers, or the product's standard grade (that is, if it's a commodity). For instance: steel rebar A15 or A408, Cartesian robotic arm R15, etc.

Generic brands are used for products that have already entered maturity or are just starting to. Odds are that by the time this happens, there will be several different companies offering the product. Additionally, either the product will be regulated by technical standards or customers will already be familiar with its technical specifications. The only time that a company would want to revert to a more specific brand would be if they developed a new product with outstanding performance in its category.

As such, manufacturers tend to use their corporate brand in addition to the generic brand, especially if they're an established and prestigious company. Be that as it may, just because a manufacturer uses their corporate brand name on a generic product doesn't guarantee that they'll receive more purchase orders or can charge a higher price.

Generic brand names are also used for identification purposes. Usually, new products with very specific applications are given a generic name. In this case, a manufacturer would give their product a generic brand name, followed by initials or numbers.

Take, for instance, the Gottwald HSK 6224, which is a type of port crane. 'Gottwald' is the corporate brand, 'HSK' refers to the type of crane (a gantry crane), '6' refers to the model number, '2' refers to the type of hoist, and '24' is the total number of wheels on the four corners of the crane.

Product Brands

Product branding is when a company creates a particular name for their product. This is in addition to the product's generic brand name. For example, the German company, BASF, makes a type of polyurethane elastomer (product category brand) called Cellasto® (product brand). See Fig. 10.5. Cellasto® is made of microcellular PU and it's often used in the automotive industry to reduce noise and vibration in car bearings and bushings.

Another example of product branding is Klübersynth CHX 2-220 (product brand) which is made by Klüber. Klübersynth CHX 2-220 is a type of chain oil (generic product brand) that's designed for a very specific application: it's meant to be used on transport and conveyor chains at automotive plants.

Product brands are used for a wide-range of industrial product lines. The cement industry uses product brands (e.g. Duramax, which is made by Cemex), the business software industry uses product brands (e.g. SAP), even the steel industry uses product branding (e.g. the US steel company owns the rights to Cor-ten, which is a type of weathering steel).

Fig. 10.5 Cellasto® is a product brand that belongs to the BASF company. Cellasto is a type of polyurethane elastomer (generic product brand). It has exceptional properties for reducing mechanical vibrations and noise

Companies use product/service brands because:

(a) A product can have a unique design or formulation. This sets it apart from other products in its category.

(b) In addition to the above, the product's target market consists of numerous, fragmented customers (these customers can exist at any point along the downstream industrial chain).
(c) In highly fragmented markets, it's better to use a product brand name (e.g. Duramax) than to use initials or numbers (e.g. the HSK 6224 crane). This is because product brand names are easier to remember and verbalize.

Point (a) above is very important. Marketers need to realize that industrial customers will be wary and mistrustful of products that come from made-up brands and provide unremarkable performance (this includes functionality and attribute performance).

Product Category Brands

An 'industrial product category' is an extremely subtle concept; it shouldn't be confused with 'product lines' or 'product families'. A *product category* is a group of technologically similar products and services that are developed by different manufacturers. This group is identifiable, distinguishable, and classifiable. The products within a product category can be functionally compared to other concepts, products, and competing categories.

For instance, the acronym ERP (enterprise resource planning) is a category of business software. There are various ERP providers. In this case, the acronym ERP is itself *a brand*. ERP products compete against other types of products within the same industry, such as in-house software development. See Fig. 10.6. Some other examples of industrial product categories are: cloud computing (which competes against in-house servers), FRP reinforcing bars (fiber reinforced rebars that compete against traditional steel rebars), etc.

Fig. 10.6 The acronym ERP (enterprise resource planning) is itself a brand. It represents a distinct category of information technology offered by several companies. As a whole, an entire product category can develop a good or bad reputation

Product categories don't just compete against products or categories in their industry. There are some notable cases in which a new category of technology has competed against, or even substituted, products in another industry. This has been true for LSF technology (Lightweight Steel Framing) which now competes against wood frames for use in housing construction panels.

Why is it important to understand the concept of a 'technical product category'? It's important for when a manufacturer creates a new product category. The sooner the manufacturer realizes this, the sooner they'll be able to brand their category and give it an identity, which helps promote the product to a fragmented market. There's a huge difference between trying to promote an 'integrated business information system' (which is generic) as opposed to ERP, which is easily identifiable and memorable.

Inventors of the new technology can even enlist some friendly competitors to help them spread the word about the new product/service category.

Product category brands share some similarities with industry brands. However, for the purposes of this discussion, a category brand can be thought of as an 'industry within an industry'. This also means that it can be a double-edged sword: it only takes one irresponsible supplier to make a mistake, and the entire category and all of the other manufacturers can suffer as a result.

One of the hardest things about new industrial product categories is that they're difficult for their inventors to recognize. How does a company know when a new product design constitutes a new product category or merely falls under a pre-existing one?

New products give rise to new product categories when they meet the following conditions:

(a) Products that demonstrate a high-level of functionality or attribute performance. Sometimes, the new product may even provide one or more additional functionalities.
(b) Based on the new product's performance, potential price, and the results of the customer economic benefits metric, the new product is likely to replace the current technology in target applications.
(c) Not only should the new product have the potential to replace a particular technology, but it should also have the potential to replace an entire technological category (e.g. led lighting versus halogen lighting in automobiles).

Once it's been developed, a new product category goes through various stages. These are shown in Fig. 10.7.

Oftentimes, it takes customers longer to adopt a new technological *category* than it does for them to adopt a new *version* of an existing technology. Manufacturers need to plan numerous promotional activities for the new category, among them, the product category brand. Without this type of brand, which is designed for markets with a high number of fragmented customers, companies will find that it takes significantly longer to introduce their new technology.

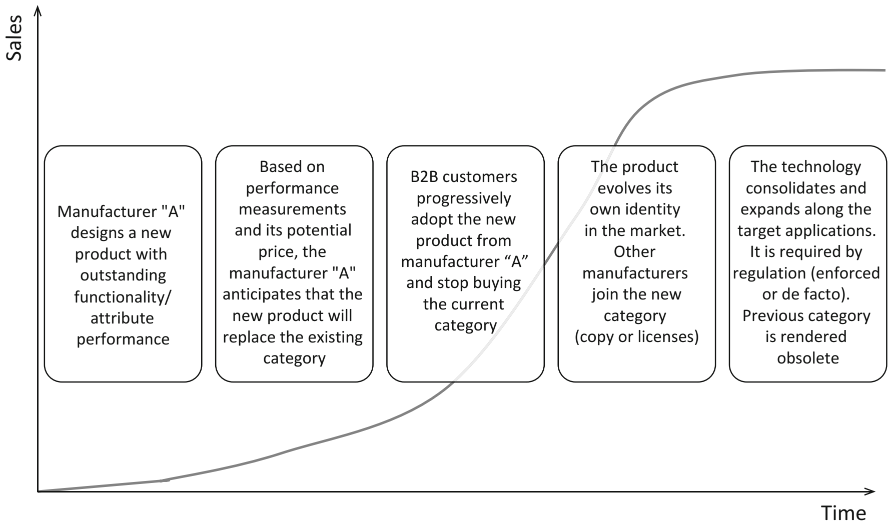

Fig. 10.7 This shows the market development process that a technical product category goes through. This process is comparable to a product life-cycle during three stages: (slow) introduction, growth, and maturity

Distributor Brands

The distributor brand is the name of the distribution company that represents one or more brands of industrial products. In this case, there are two brand 'forces' attached to each offering (albeit each carries a different meaning): the manufacturer's and the distributor's. As shown in Fig. 10.8, co-branding presents its own benefits and risks. On the one hand, industrial distribution companies need to be able to manage their own reputation; yet, at the same time, industrial manufacturers need distributors that can either maintain or improve their products' reputation.

Ideally, a company's reputation comes from successfully addressing customers' needs over a long period of time, and not from the company's size, profitability, or market value, etc. For instance, a company might try to build up its brand strength artificially simply by concentrating on a single market (buying or merging with other competing companies).

Naturally, distributors will want to develop a brand that's stronger than their suppliers. A weak distributor brand that represents a strong manufacturer brand is always in danger of losing the representation agreement. For the distribution company, this could be a real crisis.

On the other hand, it's only natural for manufacturers to want to develop a strong brand name amongst target users. That way, not only do they ensure that customers buy their product/service, but they also increase their bargaining power in negotiations with distributors.

STRONG DISTRIBUTOR BRAND	STRONG MANUFACTURER BRAND
The brand increases its power when the distributor develops a technical leadership (product integration, specifications, installation, MRO, etc.)	The brand increases its power when products are better or more apt for specific target applications
Bargaining power is usually asymmetric in favor of a strong distributor brand. There is the risk of arrogance and self-complacency on behalf of the distributor	The relationship is usually asymmetric in favor of the manufacturer. There is the risk of arrogance and self-complacency on behalf of the manufacturer
A strong distributor brand can and often represents strong manufacturer brands, but not necessarily under exclusivity	High standing manufacturers tend to favor strong exclusive distribution
Too powerful a brand can tempt a distributor to become less focused and specialized	High standing manufacturers prefer specialized and technically superior distributors

Fig. 10.8 Comparative table showing the difference between a powerful manufacturer brand versus a powerful distributor brand. The implications of having a strong, reputable manufacturer brand name, or a strong, reputable distributor brand name, are described above

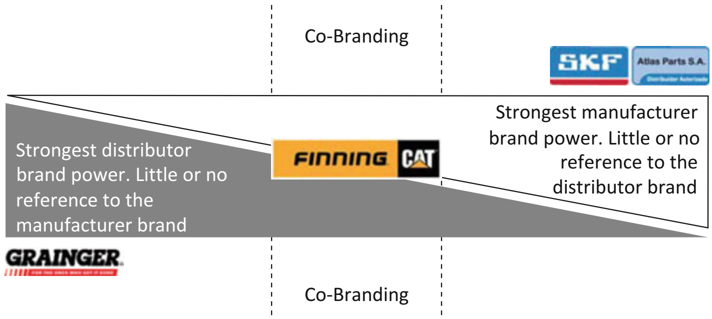

Fig. 10.9 This diagram is a sliding-scale of distributor/manufacturer brand strength. The e-commerce distribution company, Grainger, is shown on the *far left*. Grainger has a strong brand and it represents manufacturers with weak brands, or with no brand at all (in which case Grainger can use its own brand on generic products). Conversely, SKF, which is shown on the *far right*, is an example of a manufacturer with a strong brand name. SKF uses multiple distributors, most of whom have weak brands. For SKF products, customers may not even be aware of the distributor's brand. The center of the graph shows a successful example of co-branding between two companies with strong brands

Of course, in either case, a company's branding strategy has to address deeper issues than the brand name itself: namely, what the manufacturer expects from the distributor (insofar as activities and performance level), and vice versa. The worst manufacturer-distributor relationships are the ones that haven't been fully and meticulously planned out. Not to mention, there might be cultural differences between these two organizations, or they may not share the same corporate values.

In industrial markets, there are plenty of real-life examples of strong distributor brands representing weak manufacturer brands, strong distributor brands representing strong manufacturer brands, and weak distributor brands representing strong manufacturer brands. This is shown in Fig. 10.9.

The Finning-CAT example is outstanding, namely because these are two strong brands (distributor and manufacturer) that have worked together for several decades, and they've used their corporate synergy in numerous global markets. Their partnership is based around an exclusive distribution agreement for highly technical products. From an operational point of view, these two companies are very dependent on one another. Both of these companies, as well as their customers, have benefited from the dual strength of their brands. This is what is known as industrial co-branding.

Co-branding, however, isn't always the right option for manufacturers or distributors. This is because there are various types of distribution models, various types of end-user markets, and manufacturers have varying degrees of specialization. For some distribution models, it's natural for the distributor to have a strong brand (e.g. application or technology specialist distributor), while for others, it's natural for the manufacturer to have a strong brand (e.g. exclusive distribution). Manufacturers and distributors alike need to assess whether the strength of their brand name matches their distribution model. For more information on strengthening undervalued brands, the reader should turn to Chap. 9. Chapter 9 discusses different strategies for improving a company's position with other companies and with customers.

Country of Origin (COO) Brands

It's fascinating to think that even today, despite the many forms of twenty-first century globalization, people still care about where a product is designed and/or manufactured. This includes industrial technical products, which are perceived differently depending on their country of origin (where they're designed and manufactured). Some studies even show that in certain industrial markets, when it comes to making a critical or strategic purchasing decision, customers will assign country of origin (or COO) an average importance of 24 %. However, it's increasingly unclear just what a 'country brand' means. For instance: even though an excellent product could be made in Germany, its customers might receive substandard after-sales support, maintenance, and repair services from a local partner company. In turn, a BRIC product (Brazil, Russia, India, China) might demonstrate excellent performance and be significantly cheaper to acquire.

As such, it's good to understand the differences between the following terms:

(a) Country of brand (COB): this refers to where a product was originally designed.
(b) Country of production (COP): this refers to where a product is manufactured.
(c) Performance of the local representative (dealer)

Sometimes, a product is designed and manufactured in the same country (a) and (b), however, it's not uncommon for (a) and (b) to be different.

When industrial customers are making critical or strategic purchasing decisions, they usually narrow down their options to brands that have experience with their particular application. Following that, the country of production takes on increasing important in their decision making process.

Of course, the performance of the local representative (a dealer who provides maintenance, repair, and operations services for the product in question) also weighs heavily in customers' purchasing decisions.

If the local dealer has a bad MRO reputation, then it may not matter where the product comes from—even if it has a reputable COO, customers might walk away from purchasing the product.

On this note, it's good to remind industrial marketers that it's not as if industrial customers are purchasing 'pieces of art' for their personal use—they're buying products, services, and equipment for business purposes. As such, things such as business risk, financial gains and losses, and their own professional prestige weigh heavily in their decision.

Yet, despite the above, even if an industrial marketer is working for a German or Japanese company, they shouldn't try to use their national brand as a way to charge higher prices or increase their sales volume. Regardless of COO, all suppliers need to demonstrate the metric and technical performance of their offering (this includes the product as well as after-sales support) and they should be fully prepared to compare their offering to a competitor's. For industrial companies that design/manufacture good products in developing nations, this can actually be a great opportunity: it gives them a chance to design a superior offering, one that includes a high-performing product and good quality MRO services.

Once again, it's good to remember that for industrial customers, the importance of country of origin (COO) or country of production depends on how critical, or strategic, a product/service purchasing decision is.

Four Types of Downstream Industrial Chains That Affect Industrial Branding

The structure and members in an industrial chain have a direct effect on a company's branding choices. Once a company starts examining its downstream industrial chain, it might notice that certain stages of the chain are made up of highly fragmented markets or small-scale customers. For instance, the final product in an industrial chain might end up in the hands of individual consumers (households). Or, other times, an industrial chain's intermediaries are fragmented: for instance, a large number of small-scale contractor companies. As will be discussed below, depending on the degree of downstream fragmentation, industrial chains can be grouped into four different categories. Each of these categories calls for its own type of branding techniques. The four types of industrial chains that will be discussed here are:

1. Industrial chains with no downstream market fragmentation
2. Industrial chains with fragmented intermediaries
3. Industrial chains with fragmented end-users (e.g. individual consumers or households)
4. Dual industrial chains: a manufacturer has two product lines, one is meant for individual consumers, the other is meant for customer companies.

Why is it important to distinguish between industrial chains that have numerous, fragmented customers and industrial chains that have relatively few customers?

When there's a lot of customer fragmentation in the industrial chain, then, at a certain point, it becomes too expensive for the sales force to reach out to customers directly and educate them about the technical offering.

As discussed previously in this volume, when it comes to industrial sales, the ideal is for each target customer to receive a personalized technical consultation, where they can meet with a professional representative that specializes in a particular product or field. Oftentimes, however, this just isn't possible. So, instead of a technical professional, a company has to rely on a different type of 'ambassador': their brand. Naturally, a brand doesn't communicate the amount of technical information that a face-to-face meeting with a professional would. However, a brand can play an important role during certain stages of the purchasing process: namely, it lets customers know that the manufacturer, product, or product category exists. This is called *awareness*. Building awareness isn't about making a brand famous, rather, it's about making sure that customers associate a certain brand with a certain manufacturer's offering/performance. It's about declaring: 'this product/service exists and it may be a viable alternative'.

Figure 10.10 shows the cognitive stages that industrial customers go through when they adopt a new product. The first of these stages is awareness. In highly fragmented markets, industrial branding techniques play an important role in creating this awareness.

The last stage of the adoption process is user experience, which lasts until the end of the product's service life.

As mentioned earlier, a brand in and of itself isn't enough to make a customer go from 'awareness' to 'product/service acceptance'; in fact, oftentimes, it isn't even enough to make customers learn about the product (this refers to the interest stage).

What this means for an industrial marketer is that they need to provide more than just a brand—the brand should be combined with technical marketing communications that empirically show why the company's product is better. What's more, a

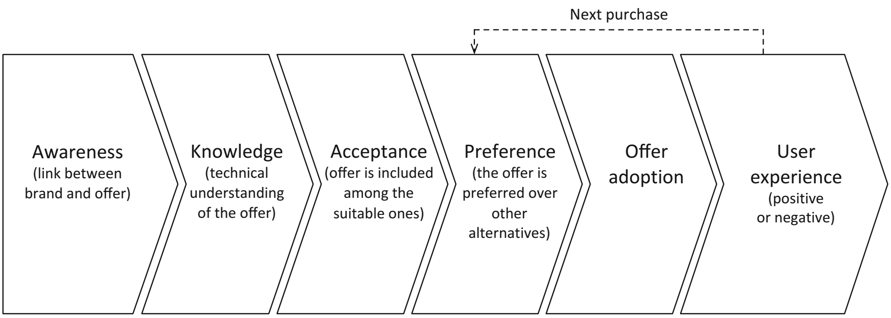

Fig. 10.10 The cognitive stages of the product adoption process, adapted from Lavidgee and Steiner's 6 stage cognitive model. In highly fragmented markets (where there are numerous customers), a company can use different types of branding techniques to create awareness of their product/service

marketing strategist can design different marketing communications for different customers depending on where these customers are in the product adoption process (see Fig. 10.10).

Industrial Branding for Industrial Chains with Fragmented Intermediaries

After studying the structure and fragmentation of different stages in the industrial chain, a company may find that one of the intermediary stages (in this case, installation/integration/contractor companies) is highly fragmented. See Fig. 10.11. Just as their name suggests, these fragmented intermediary companies are responsible for buying, installing or integrating the product. Most likely, the majority of these intermediaries are small to medium-sized companies that install or integrate the product before selling it to end-users.

As mentioned above, if any one of the stages is fragmented, it presents an extra challenge for manufacturers. Manufacturers have to create awareness of their product and educate customers about their product's performance; in this case, however, the manufacturer's sales force won't be able to work with the majority of customers. This kind of situation becomes even more complicated if there are additional distributors between a manufacturer and the fragmented intermediaries.

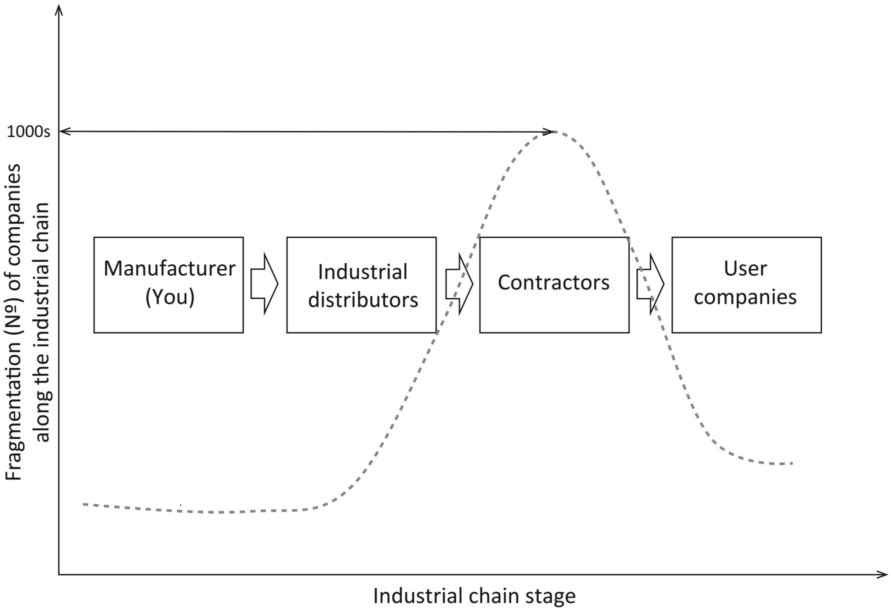

Fig. 10.11 Industrial chain with a fragmented intermediary stage (a high number of small to medium-sized companies). Note that this intermediate stage may be comprised of installation companies, contractors, construction companies, etc. In each case, the intermediary buys the product, integrates it, and subsequently sells it to a customer company

Choosing the right branding technique depends on the nature of the product. If a product is already mature or commoditized (e.g. basic cement used for construction), then it would be futile for a company to try to improve public perception of their product through an individualized product brand. So, if this is the case, a company should use their corporate brand together with the generic product brand. A company may also decide to use their country of origin brand COO (if applicable).

As for new products, things get more interesting. If the product gives rise to a *new category*, then a company needs to develop a product category brand (see the above section on product category branding). There are huge advantages to having a new product category brand in an industrial chain with fragmented intermediaries. Since the technology is new, a company can develop a dominant design for certain segments/applications. Ideally, a manufacturer should have enough installed capacity to produce large volumes of the product, which should allow the manufacturer to become a product category leader. Additionally, they should make sure that the new trademark is protected under intellectual property laws. Depending on how successful the new product is, competitors might try to copy it. Before the product category can expand, the company that invented the new technology needs to make sure that competitors are complying with the product's quality specifications. What's more, it can be good for a company to have quality competition—other competitors can help promote a new product category. It's worth remembering that, at least initially, a new product category is competing against substitutes—without promotional help from direct competitors, it can take the market a long time to adopt a new product. The inventor of the new category needs to make sure that imitators (companies that can help promote the new product) have sufficient installed capacity, the right distribution system, and will be producing a high quality product.

While some products may be a good alternative for applications with fragmented customers, they may not give rise to a new product category. In this case, the product should be given its own individualized product brand (e.g. Plastocrete® MX-1600, manufactured by Sika). In order to reach fragmented intermediaries, industrial marketers will have to get to know their language and business culture. An industrial marketer should demonstrate empathy for each type of customer and help them remember and pronounce the brand name.

Notwithstanding the above, industrial marketers should never stop communicating with and educating end-users. A lot of industrial manufacturers get fixated on the purchasing power of fragmented intermediaries, and they forget that intermediaries are receiving technical specifications from someone else. In this case, the purchasing power is shared.

Industrial Branding for Supply Chains with Fragmented End-Users

Here, the manufacturer's product starts by traveling through the various stages of the industrial chain; along the way, it's modified, integrated, or used as a component in other products. Finally, it reaches its end-users, who, in this case, consist of a large number of companies or individual consumers (take, for instance, a transistor manufacturer; through product integration, transistors are used in numerous applications and reach a large numbers of users). Because of the nature of these products' target applications, there could be thousands, hundreds of thousands, or even millions of end-users. See Fig. 10.12. Since the product goes through so many modifications in the industrial chain, it will probably reach end-users as a product component or ingredient.

Because of this, end-users are often unaware of the many ingredients and components that go into a single, finished product. Generally speaking, when someone buys a television, car, or piece of furniture, they're not thinking about how it works or what it's made of.

This can be a huge challenge for industrial manufacturers that design and develop ingredient products that allow finished products to function.

For instance, high-performance optical lenses play a central role in a camera's functionality. Or, a high performance chemical ingredient could improve or increase the functionalities of a finished product, such as foods, detergents, paints, coatings, personal protective equipment, clothing, and thousands of other end-user applications.

Naturally, if a manufacturer develops an outstanding ingredient product, one that affects the finished product's functionality or attributes, then they'll want to generate awareness of their product amongst end-users. This is known as 'ingredient branding'.[1]

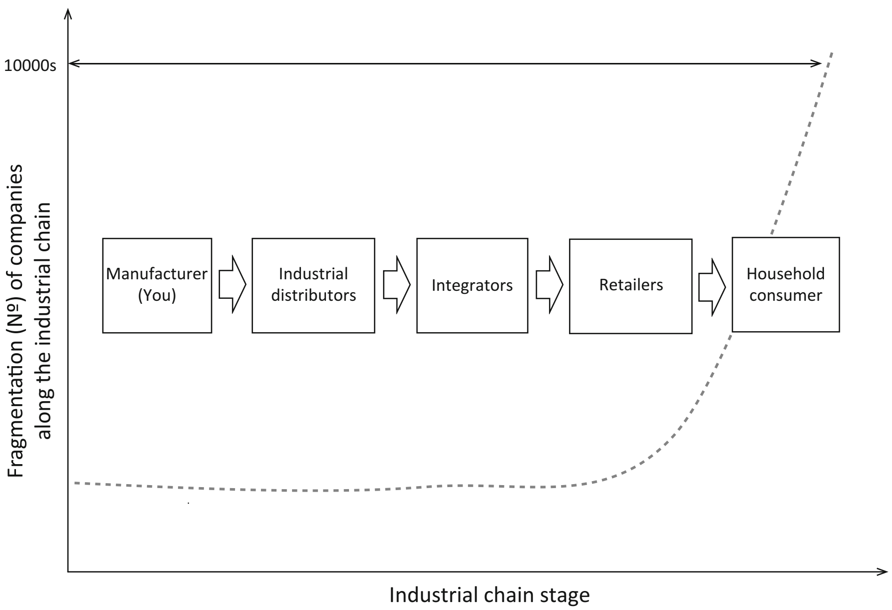

Fig. 10.12 Industrial chain for a product with highly fragmented end-users. As this product travels down the chain, it's installed, integrated and/or modified into a finished product. End-users are often unaware that these ingredients or components products exist or what their function is

[1] B2B Brand Management. P. Kotler, W. Pfoertsch. Springer Berlin. 2006.

Ingredient Branding This branding technique is for manufacturers that make ingredient or component products and want to build awareness of their product amongst end-users. A company can build awareness through marketing communications, by advertising their ingredient brand alongside the finished product's brand. Sometimes, a manufacturer will decide to use their corporate brand as an ingredient brand, or they might use the product's generic name, or, other times, they may decide to use an individualized product brand. See Fig. 10.13. No matter what, a manufacturer can only use ingredient branding if their product significantly contributes to the finished product's attributes and/or functionality.

By using their corporate brand as an ingredient brand, a manufacturer is actually engaging in a type of co-branding. In this case, the two companies in the co-branding agreement are the ingredient manufacturer and the finished product manufacturer.

For instance, the lens manufacturer, Zeiss, does co-branding with a camera company; Shimano, which makes brakes and gear shifters, does co-branding with a bicycle manufacturer; Bosch, which makes fuel injection systems, has co-branding agreements with automotive manufacturers, etc.

It's worth stressing that a corporate-ingredient brand doesn't mean that the finished product contains any new technology. Rather, this brand simply capitalizes on a manufacturer's good reputation in their industry. Once again, the reader is reminded that the ingredient product has to play a significant role in the finished product's functionality or attributes (e.g. camera lenses, bicycle breaks and gear shifters, etc.). For instance, it would be hard for a company that produces metallic

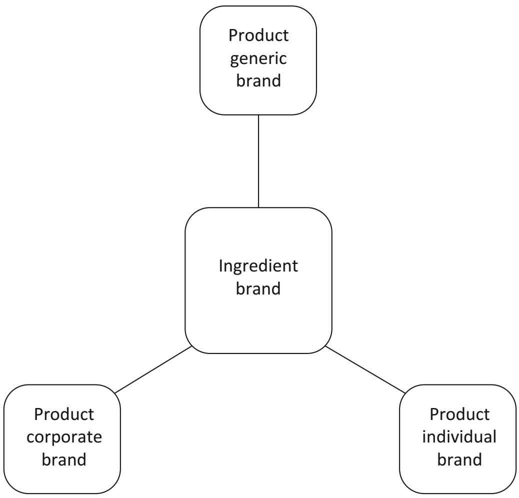

Fig. 10.13 Different types of ingredient branding for ingredient/component products. A good corporate brand helps reinforce an ingredient product's reputation; however, it doesn't necessarily mean that there's been any new product development. A generic brand, in this scenario, is similar to a product category brand. An individualized product brand implies that the technology could be protected under intellectual property laws (and, therefore, is patented)

copper (or some other periodic table commodity—PTC) to develop a corporate-ingredient brand. There is a reason for this: this kind of ingredient product is heavily regulated and standardized, so it's harder for ingredient manufacturers to develop a long-standing reputation with end-users (which is something component manufacturers can do). Interestingly, however, raw materials will sometimes gain traction in a new application (e.g. lithium batteries); if this happens, a company can develop a generic-ingredient brand.

A generic-ingredient brand (e.g. lithium batteries, polyurethane paints, activated carbon filters, aluminum car bodies, xenon lights, etc.) calls customers' attention to a generic product used in the finished product. In this case, the ingredient product should significantly improve the finished product's functionality or attributes, or, it should give the finished product new functionalities and attributes. These ingredient products can be simple commodities (PTC), complex commodities (CCC), or an entirely new compound (for a more in-depth explanation of PTC and CCC commodities, the reader should refer to Chap. 3). As a branding technique for finished products, an outstanding ingredient product can speed up the adoption process for new products. However, it's important for the manufacturer to realize that by promoting the generic ingredient product, they're also promoting their direct competitor's product. If the ingredient product is a new outstanding compound, the manufacturer probably shouldn't promote it as a generic product—instead, they should consider branding it as a new product category (see above). And, of course, a generic-ingredient brand shouldn't be confused with an industry brand. If an *industry* wants to promote a commodity (a PTC or CCC so that it can compete with substitutes, for instance), or a particular type of material, they can do so directly to end-users.

An *individualized ingredient* brand raises customer awareness of products that have been specially developed during research and development programs. As such, these products should be patented, or protected by intellectual property laws. Once again, the reader is reminded that the ingredient product should significantly improve the finished product's functionality or attributes, or even provide it with new functionalities and attributes.

Some examples of individualized ingredient brands include: Gore-Tex, which is used in outdoor clothing and shoes, NutraSweet, an artificial sweetener used in certain food products, Kevlar, which is used in personal protective equipment and industrial belts, etc. No doubt, this is a remarkable and ingenious way of generating customer awareness and stimulating end-user demand. However, this type of branding is reserved for industrial manufacturers that have developed truly outstanding products, ones that are so noteworthy that they merit a new product category.

The ingredient brands described above are there to help industrial marketers; when appropriate, industrial marketers can use these concepts and put ingredient branding to good use. Sadly, history is full of examples of manufacturers that have designed a new ingredient product (one that significantly improves the finished product) only to find that the finished product manufacturer has taken advantage of their technology without ever once giving them credit.

Industrial Branding for Supply Chains with No Downstream Market Fragmentation

In these types of industrial chains, there's no noticeable market fragmentation between the manufacturer and the end-user. Even the end-user is a company. Sometimes, there's not even a single intermediary, allowing the manufacturer to sell their products/services directly to user companies. This is depicted in Fig. 10.14. Since this industrial chain contains a smaller number of companies, a manufacturer can use their sales force to commercialize their products/services directly. In these kinds of situations, most industrial companies prefer to use their *corporate brand*, together with their *product*'*s generic* name and an acronym or product identification number (e.g. Siemens gas turbines SGT-600, Komatsu mining truck 930E, etc.).

This type of industrial chain is mostly comprised of technically knowledgeable personnel. Customer companies' engineers abound. These engineers know that all of the products and services being offered have been specially designed for a specific application. As such, it would be misguided for a manufacturer of port cranes or gas turbines, for instance, to develop an individualized product brand (e.g. Hotspin Turbine 2000).

In this example, the abiding problem with individualized product brands is that they're greeted with a lot of customer/colleague skepticism. Having an individualized product brand for a high-tech product (one with very few customers) could strike people as manipulative, something that only a superficial marketer would do. Here, the key to branding is about tackling customers' perceived risks, that is, the

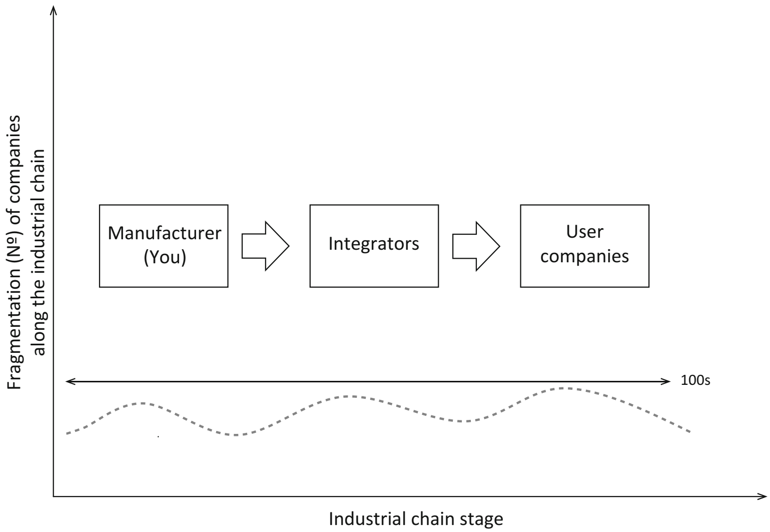

Fig. 10.14 This industrial chain does not contain any market fragmentation (it has a reduced number of customers). Frequently, this kind of industrial chain is shorter and manufacturers sell their products directly to end-user companies. In this case, manufacturers tend to rely on corporate branding as their preferred branding technique

risks they associate with the manufacturer behind the product. This kind of branding is about the manufacturer and the manufacturer's corporate brand. Or, the manufacturer and their track record with a given product. Or, the manufacturer and the support they'll provide throughout a product's service life. Or, the manufacturer and their product warranty in the event of future problems.

Naturally, the product should be identified with its generic name (e.g. valve, turbine, panel, conveyor belt, etc.) and a unique identification number or letter. If the product in question is very innovative, then its manufacturer should create a new generic product brand name that incorporates compound/engineering terminology (e.g. graphite rebar 15, C/SiC Ceramic Matrix Composite, etc).

Industrial Branding for Dual Supply Chains: What to Do When the Same Brand Reaches Both Companies and Individual Consumers

In a dual industrial chain, a manufacturer's products and corporate brand travel down two very different distribution channels: one of these ends with individual consumers, the other is exclusively industrial (the end-user is a company). This is shown in Fig. 10.15. Generally speaking, both sets of end-users will be exposed to the manufacturer's corporate brand, although the products they receive will be different (e.g. the manufacturing company, Hyundai, makes cars for consumer consumption and vessels for shipping companies).

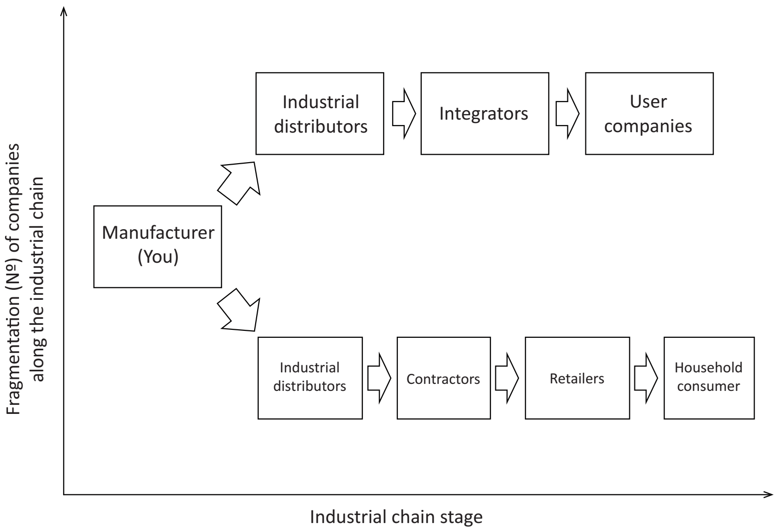

Fig. 10.15 Example of a dual industrial chain. A manufacturer's products travel down two different distribution routes, one of these ends with individual consumers and the other ends with industrial customers. The products in each distribution channel tend to be different from one another, and they may have been manufactured in different business units or divisions. However, the corporate brand is the same. As such, industrial customers (both buyers and users) will be familiar with a manufacturer's industrial products as well as their consumer products

Fig. 10.16 Four examples of corporate brands that distribute their products through a dual chain system: one of these chains leads to individual consumers, the other leads to industrial customers. The products in each supply chain are different from one another, and they may have been designed, developed, and manufactured by different divisions or areas within the company

Given the nature of this supply chain, industrial customers will experience two types of awareness: awareness of the industrial brand, and awareness of the consumer brand.

If a company manages to successfully position its consumer market products, then they may find it easier to position their industrial products or, at the very least, generate awareness and product acceptance (e.g. Mercedes Benz cars and Mercedes Benz diesel electric generators).

However, an industrial marketer should be intelligent enough to keep a company's industrial position separate from its consumer market position, lest something go wrong. It's much easier for mediocre consumer market products to discredit an industrial brand, than it is for a substandard industrial product to discredit a consumer market brand. Figure 10.16 provides some examples of corporate brands that use a dual supply chain system.

The Eight Laws of Industrial Branding

One way to summarize this chapter is to follow the example set by Al and Laura Reis when they wrote *The 22 Immutable Laws of Marketing* for consumer market products.[2] Although there are less laws for industrial products (for now), these laws are more technical and conceptual in nature.

[2] *The 22 Immutable Laws of Marketing*. Al Ries and Laura Ries. McGraw Hill. 1998.

Law Nº1. In industrial markets, a brand in and of itself won't get a company the market position it wants. First, a company needs to comply with its customers' product/service performance requirements.

Law Nº2. The greater the market fragmentation (either amongst intermediaries or end-users), the greater the advantage of using an *individualized brand* for a new industrial product.

Law Nº3. When necessary, a reputable industrial company can expand its corporate brand to support new business lines/products (however, this is not an excuse for a company to randomly expand its business—a company should remain focused on certain businesses/products).

Law Nº4. In industrial markets, if a company is introducing a me-too product, they'll need to use its generic product name. If the generic name is trademarked, then a company can use a spin-off name combined with its own corporate brand name.

Law Nº5. In industrial markets, companies that create a new *product category* should promote it using an individualized *category* name.

Law Nº6. In fragmented industrial markets, a company may promote a new brand through marketing communications. These communications should include metric data about the product's functional performance.

Law Nº7. An industrial company should only invest resources in building awareness in target applications or amongst its target customers.

Law Nº8. Manufacturers should use 'ingredient branding' if their product plays a major role in the finished product's performance.

The purpose of this chapter has been twofold: on the one hand, provide the reader with a technical approach to industrial branding, and on the other, distance the reader from the type of metaphysical branding discussions that are common to consumer markets.

On the surface, industrial branding might seem simple. However, there are still a lot of concepts that, while intuitive, have yet to really take shape for a lot of industrial marketers. With this chapter, this author hopes to have contributed to this emerging discussion.

11 Pricing Technical Products

Introduction

Arguably, one of the greatest turning points in the history of business took place some 5000 years ago. Up until then, gold and silver had been used for decorative purposes or as means to accumulate wealth. Then came the invention of the first weighing scale in Ancient Babylon and it precipitated a truly unforeseen revolution. Because the scale accurately measured weight, it meant that gold and silver could be used as units of account or units of weight, which, in turn, meant that anything could be given a price. Although it would be another 2700 years before a formal monetary system was developed, the ability to assign value to goods based on metal weights undoubtedly constitutes the first known financial abstraction of all time. A significant portion of the Code of Hammurabi (dated to 1780 BC, it is the oldest known body of laws and, in all likelihood, gave way to modern day legal codes) prescribed prices and fees based on metal weights.

For instance, the Code of Hammurabi dictated that "if a man rents an ox and blinds its eye, he shall pay one-half of the animal's price to the ox owner." Or: "if a man rents an ox and breaks its horn, severs its tail, or hurts its muzzle, he shall pay one-fourth of the animal's value in money." In Ancient Babylon, renting oxes was equivalent to a modern-day business-to-business service.[1]

What's especially interesting for the purposes of this chapter is that the Code establishes different fines for blinding an ox versus breaking its horn. Why are these two fines different from one another? In order to answer this question it's important to remember that the fines dictated by the Code of Hammurabi were once real prices. Even back then, the meaning of a price was understood as something different from the mere cost of an eye or a horn. As will be discussed further on in this chapter, in an industrial context, the price of a product (whether bought or rented) is a reflection of the operational benefits it provides.

[1] Babylonian law—The Code of Hammurabi. Claude Hermann Walter Johns. The Eleventh Edition of the Encyclopedia Britannica. 1910–1911.

C.A. Saavedra, *The Marketing Challenge for Industrial Companies*, Management for Professionals, DOI 10.1007/978-3-319-30610-0_11

Hence, the price of an industrial product or service should be thought of as a *consequence*. Although this may seem like a very simple idea, it is a fundamental paradigm for understanding pricing.

If prices are a consequence, then it means that prices are determined and constructed by other activities and company decisions. These activities and decisions have already been covered in this volume: identification of customer problems and needs, development of a product or service that solves the problem and provides tangible, measurable, and proven benefits, and a supplier's commitment to consistently improve their offering. Given the above, it would be a mistake to think of pricing in and of itself as a *strategy*.

Common Mistakes in Industrial Price Management

The conventional wisdom amongst companies is that prices are a key tool for earning a profit and fulfilling a company's business goals. Yet, for an industrial customer, a supplier's price has traditionally been seen as a major obstacle, one that inhibits their own profitability and well-being. As such, one company's loss is another company's gain.

Perhaps no other activity exposes the weak points in marketing and sales management quite as much as when companies quote their prices to customers. Companies experience a lot of anxiety and uncertainly when they quote their prices. Almost as if they were 'crossing their fingers' and hoping for the best.

This approach towards pricing shows that neither suppliers nor industrial customers fully understand the significance behind the product/service that's being bought or sold. In order for this chapter to discuss the significance behind the offering, the reader first needs to consider the following two points:

- The ideas discussed in this chapter are meant for progressive companies, that is, companies whose primary purpose is to benefit customers through the products/services they develop. These companies are constantly adapting their products in order to meet increasingly demanding, intensive, and complex sets of needs. These are the needs of their customers, their customer's customers, and above all, their end-users.
- The ideas discussed in this chapter don't apply to opportunistic business people or administrators, or to companies whose sole 'business model' is to buy cheap in order to sell high (some intermediary companies fit this definition). Nor do they apply to 'price followers', companies that mimic the prices set by more progressive companies.

It would be a mistake to think that the above two requirements only apply to suppliers, and not to customer companies as well. Customer companies can just as easily be classified as opportunistic followers or can end up thinking that the sole business objective is survival. To any readers that see their business this way, the book reminds them that in order for a company to conduct good industrial marketing and proper sales management, it has to educate its customers and demonstrate the benefits of using its product/service. These benefits may very well extend to the entire downstream industrial chain.

Technically speaking, the most common mistakes that companies make when pricing industrial products and services are:

Cost-Based Pricing

This is perhaps the most common form of pricing amongst industrial companies. No doubt, cost-based pricing is attractive and convenient: on the one hand, it ensures that a company isn't selling its products at a loss, and on the other, a company can set its price based on the amount of profit it would like to obtain. A company knows what its costs are (or it should) and it'll also know how much it wants to gain.

There are numerous downsides to this pricing method, however. On the one hand, it means that a company is blindly pricing its product, regardless of what customers in different applications are willing to consider a fair price. On the other, it doesn't take into account market dynamics such as competitiveness, alternative substitute products, or price variations that have to do with a product's life cycle. Cost-based pricing results in products that are priced too high or too low (and, in this author's experience, it tends to be the latter).

This doesn't mean that an industrial marketer should ignore how much it costs to produce a product. Production costs need to be properly understood and managed; a company can use production costs as a reference point (or price floor) when its price calculations (see value-based pricing below) come dangerously close to this lower limit.

Cost-Based and Competitor-Based Pricing

In this case, a company determines prices based on costs and the pricing behavior of competitors or substitutes. This means that a company sets its prices depending on its product/service *features* compared to competitors.

The problem with this pricing policy is that it's a subjective, or intuitive, way of determining product quality. Any performance comparison between competing products and services needs to take into account the functionality(ies) and attributes that customers are looking for; moreover, a side-by-side product/service comparison needs to consider a customer's application conditions.

Cost-based and competitor-based pricing is a pricing method that is frequently used by industrial companies. Unfortunately, the effects of this pricing policy can be even worse than those of simple cost-based pricing (which doesn't account for competitors' behavior): it can create a price war. This means that, in an attempt to win a particular customer, competitors engage in a type of 'reverse auction'. The customer ends up opting for the cheapest option, without really considering variations in product performance. When suppliers habitually engage in this type of behavior (typical of followers), their customers will get used to purchasing the least expensive offering that fulfills their bare minimum technical requirements. As a result, one could argue that these customers are shaped by their supplier's bargain culture.

Prices Based on Customers' Purchasing Behavior

Here, an industrial supplier's prices are based off of a customer's negotiation methods and culture. The customer, who may also be considering *its* customers' purchasing behavior to determine its *own* prices, can become increasingly aggressive during negotiations with suppliers. As a result, a good portion, if not the entirety, of the companies in the industrial chain can end up 'contaminated' by a survivalist drive to lower costs. Naturally, this affects suppliers who have made an effort to develop better products.

This is all the more reason for an industrial marketer at a progressive company (one whose products and services are specially designed and adapted for each application) to develop an educational campaign for downstream customers, and especially for end-users. As discussed in Chap. 8 (which dealt with consultative selling), this needs to be planned ahead of time.

Prices That Ignore Differences in Product Applications

In this case, the industrial company assumes that different applications benefit equally from a product/service. As discussed in this book's chapter on industrial market segmentation, ideally, each market application should get its own specific product design (this assumes that a company has studied an application, characterized it, and considers it to be a good target application). However, for a lot of products (ingredient, component, or finished products) this isn't possible—their applications are so fragmented that it simply isn't feasible for a company to develop specialized product designs.

Interestingly, depending on how or where it's used, a single product design can provide more or less benefits to users in different applications. So, does this make it legitimate for an industrial marketer to price a product differently depending on how it's going to be used?

It does. If a product is central to an application and provides more benefits (a solver or positioner product, see Chap. 3), then it's legitimate and justified for a company to set a higher price. For suppliers, this represents a political and communication challenge, one that's made easier when the supplier is the one reaching out to customers in different applications. Traditionally, the sales force is the one responsible for approaching different application customers, iterating with them, and demonstrating the metric benefits of using their product.

However, this pricing strategy doesn't work when customers approach a supplier independently and request a price quote on a specific product design. Likewise, price differentiation can't be used on products that are commercialized via intermediaries (e.g. distributors) that lack a specialized sales force. In contrast, it does work for distribution channels that use parallel or application specialist distributors.

At this point, it's good to point out that there's a difference between the concept known as *price discrimination* and *application-based price differentiation*. In price discrimination, customers are charged differently depending on their buying power, or how much they're willing to pay (a good example of this are regional blu-ray discs; a blu-ray DVD bought in India won't work in markets where consumers are able to pay more). In application-based price differentiation, prices vary depending on the amount of benefits customers receive from using the product.

In practice, if a company is going to use application-based price differentiation, they should also consider competitors' pricing behavior and how superior their product is for a given application.

Manipulating Prices in Order to Increase Sales

Managers that are under pressure to meet sales objectives are often tempted to lower prices. Lowering prices in order to meet sales objectives can have dangerous consequences, the worst of which is 'discounter's syndrome',[2] shown in Fig. 11.1. When a business unit manager gets 'discounter's syndrome', they'll progressively lower prices in order to achieve the sales goals in their company's budget. Initially, as a company's profit increase, the results are falsely invigorating. The problem appears suddenly, when, after x number of discounts, the company begins selling the product at a loss (that is, below its unit cost). By that point, the company will be getting large-volume purchase orders, meaning that their revenue losses will be that much greater. It can be considerably hard for a company to get out of this situation since, in all likelihood, their competitors will have responded with lower prices of their own. Once this happens, it can take a surprisingly long time for a company to stop selling its products for little to no profit.

Using the Price as a Tool to Capitalize on Production Capacity (in Markets with Steady Inflation)

Some industrial companies have a 'tonnage culture', and they use prices as a way to maintain steady levels of production at their factories or plants. As a result, managers will lower prices during certain times of year, oftentimes unaware of the effects this has in the medium-term. These kinds of executives don't seem to understand that during any given year—even good years—there's always going to be slow periods (lasting one, two, or even three months), where the company sells less than it had anticipated. The pressure to provide good sales figures at the end of each month is what drives these executives to arbitrarily lower prices in order to maintain

[2] Consultative selling. 6th edition. Mack Hanan. Amacom. 1999.

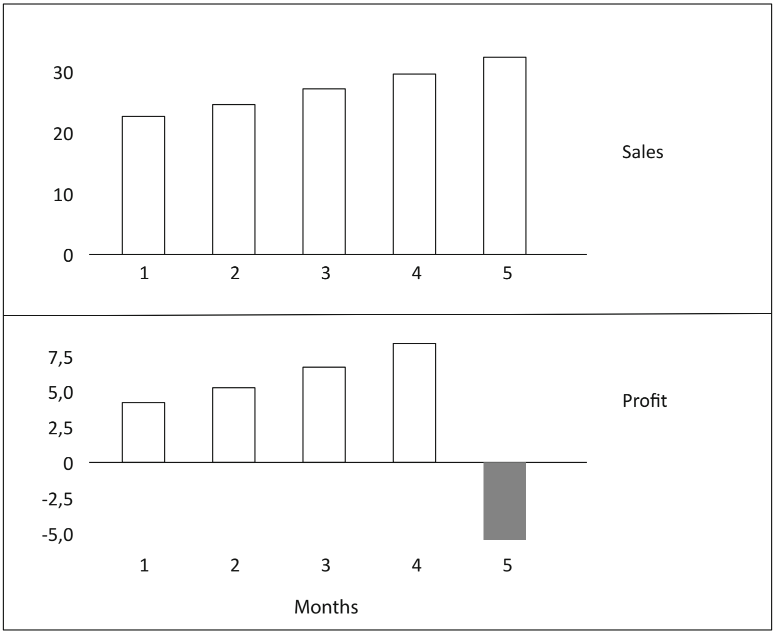

Fig. 11.1 Discounter's syndrome. Business unit managers under pressure to meet sales objectives will progressively lower prices. They don't realize that the increased sales volume can actually result in significant and unexpected losses in company revenue. These losses can be drawn out over an undetermined amount of time

a high sales volume. Perhaps in the short-term, some of these executives will get what they're looking for. Then again, it's also true that lower prices don't necessarily increase sales. Companies that act this way are forgetting that industrial sales depend on the available number of Capex/Opex projects, or the limited amount of demand that exists over a set period of time.

The effects of this pricing strategy are felt just as soon as the market starts to improve and executives try to raise the price again.

How do they justify the price increase? Quite simply, they don't. It's unjustifiable.

On the other hand, most managers know that while customers are happy to accept any unexplained price decreases, any sudden, unexplained price increases will leave them somewhat confused and upset. These managers realize that industrial customers will already have committed themselves to their own, fixed price quotes (this is common practice in markets with stable inflation rates). The terms and conditions of a price quote have a validity period that gives customers, or a customer's customers and so on, a certain degree of cost stability. This is shown in Fig. 11.2. Alternatively, when inflation is unstable, suppliers can index the final price to the key cost drivers in their cost structure (e.g. oil, gas, electricity, raw materials, etc).

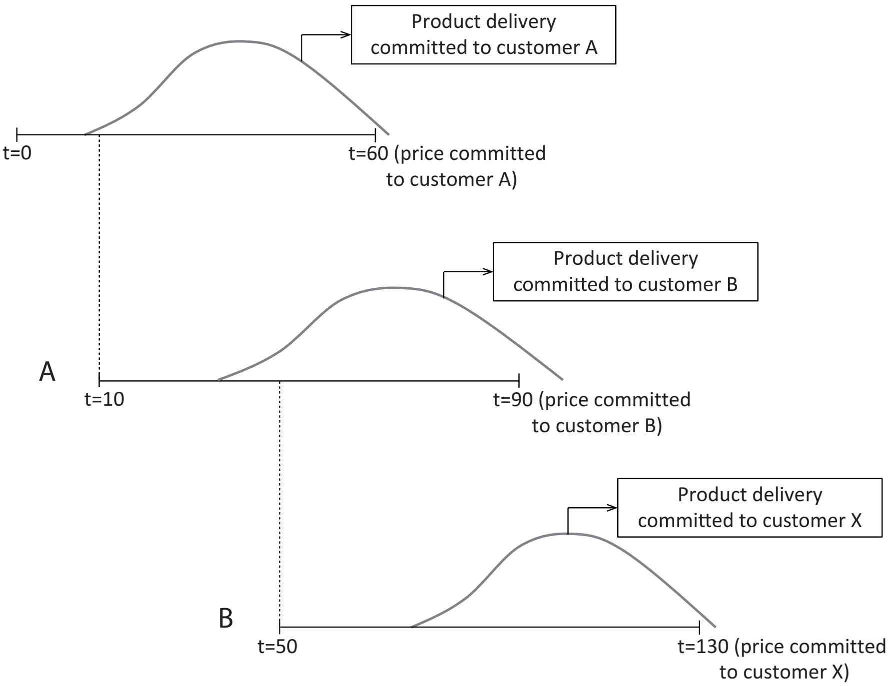

Fig. 11.2 In markets with controlled inflation, the validity period on price quotations/contracts is hugely important for customer companies, since it stabilizes their costs. Likewise, the customer company (e.g. customer company B) has its own agreements to keep with *its customers*: they agree to produce and supply a product under a certain set of commercial conditions throughout the lifetime of the project. Given this chain of events, it's difficult for a supplier to make short-term changes to their product/service prices

However, the situation is different for industrial companies whose products are distributed to fragmented customers (e.g. materials used in small-scale construction projects). These companies are in similar situation to that of consumer market suppliers; they can consistently change their prices depending on demand and stock, without seriously affecting the budgets of any downstream industrial customers.

Companies That Lower Their Prices Even When Their Product/Service Provides Outstanding Performance for a Specific Application

Sometimes, anxious not to lose sales, industrial companies with outstanding products or services end up in a price war against competitors with undeniably inferior products/services. Most of the time, the problem arises because the sales force doesn't know how to adequately demonstrate the superiority of their product to customers. In fact, quite the opposite: it isn't hard to find examples of sales forces that have actually supported or encouraged 'easy sales'. Companies that design, produce, and supply products that are better suited to a given application, are probably doing so at a higher cost to themselves. As such, these are precisely the sort of companies that require a more specialized and proactive sales force. These companies shouldn't be using sales management strategies meant for high-volume commoditized products. Before long, their profits will start to erode. These are the very profits that allow them to invest in product development programs in the first place.

A General Model of Price Determination for Technical Products

Conceptually speaking, the model of price determination presented in this book is based off of the measured benefits that a product provides for customers' problems or challenges. This model is represented in Fig. 11.3. In order to follow this process, companies first have to segment their markets according to product applications (that is, applications at the end-user level). Targeting and market segmentation were extensively discussed in Chap. 5.

It's important to point out that without an adequate industrial market segmentation program, it's very difficult for a company to price its products based on the

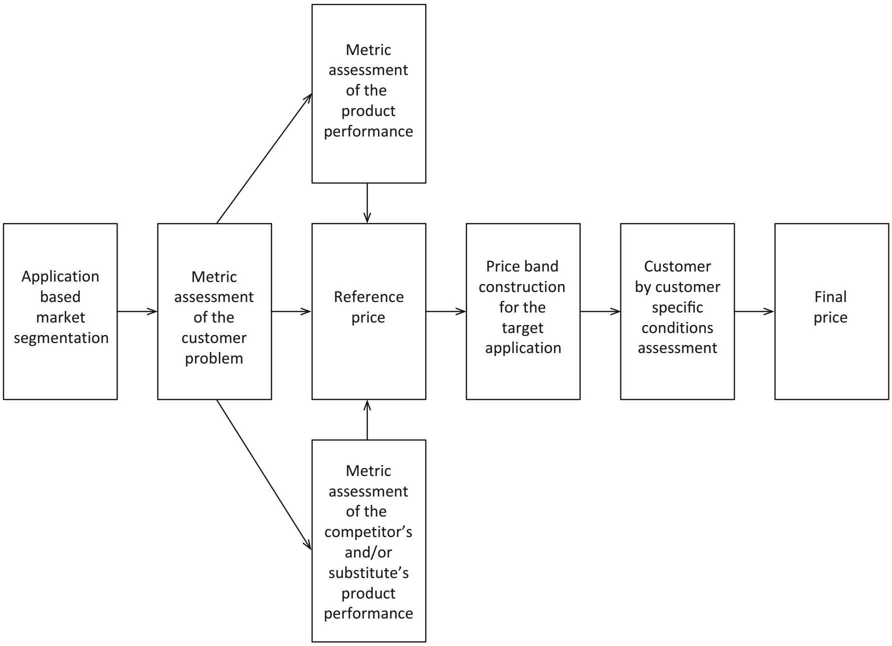

Fig. 11.3 Pricing program for industrial technical products. In order for this process to work, a company has to properly and thoroughly segment its markets according to product application. The reference price is a key feature in this process (see text); it serves as the basis for a broader price band, within which a company can determine the price for each customer on a case by case basis

benefits customers receive. Barring such a program, an industrial marketer is limited to calculating prices based on costs. This can prevent a company from earning a fair profit, which, given its creative and productive efforts, it is certainly entitled to.

In Search of a Reference Price

The reference price here presented should be one of the founding pillars of an industrial pricing system. A company can use it to build price lists of standard products, to determine prices of made-to-order offers, or as a guide when they're uncertain about how to price a new product. The reference price is both practical and ideal—it assigns a value that is fair, legitimate, and balanced for both customer and supplier.

As shown in Fig. 11.4, the reference price is the halfway point on the price band. Within this band, the industrial marketer determines the precise price. This chapter will discuss the factors and circumstances that an industrial marketer should consider in order to determine this precise price.

Value-based pricing, or VBP, is a pricing method that can be used to determine a reference price. Even though value-based pricing is based on fairly simple and intuitive logic, it can be quite laborious to use. VBP is intuitive in the sense that a supplier should value a superior offering at a higher price; this is the same as when someone intuitively knows that the price of a Mercedes Benz car is higher than that of a Chinese car made in the same year. However, unlike this last example, companies that want to use VBP in an industrial context have to meet certain requirements:

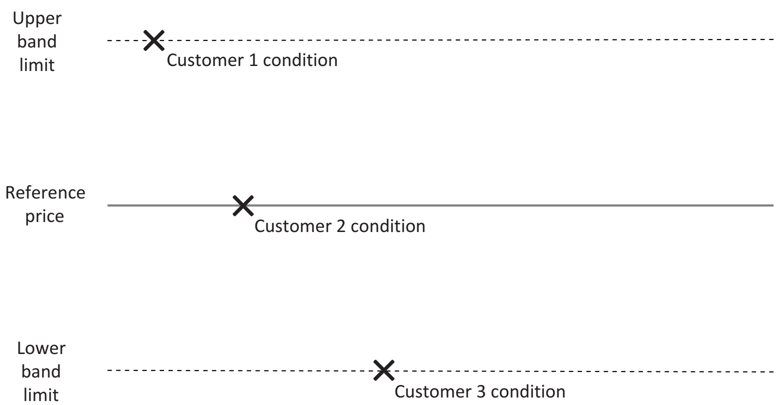

Fig. 11.4 The reference price (*solid line*) is at the center of a price band with upper and lower price caps (*dotted lines*). The precise price is located within this band and it varies on a customer-to-customer base. A company can use value-based pricing (VBP) to determine the reference price. Value-based pricing incorporates information such as: the price and performance of competing products, substitute products, or the technology that the supplier is attempting to replace

$$\text{Performance}(\$)_1 - \text{Price}(\$)_1 > \text{Performance}(\$)_2 - \text{Price}(\$)_2$$

Fig. 11.5 The value-pricing equation is more subtle, and more practical, than one might think. The equation, which compares the value of two competing products' performance and price, involves two subtraction operations. The results show how much a customer stands to gain (in monetary terms) by adopting a particular product. A manufacturing company has a better chance of making a sale if the value on their side of the equation is greater than that of their competitor's

(a) A company needs to obtain precise information about a customer's needs. This allows the company to calculate the monetized costs of a customer's *problem*. In order to obtain this information, the company can develop a market research program (e.g. the Discovery Team©).
(b) A company needs to compare its product's performance to a competing product, substitute product, or to the technology that it's attempting to replace. Performance differences should ultimately be expressed in monetary terms.
(c) The difference in value (expressed in monetary terms) between a product's performance and price should be greater than the difference in value (expressed in monetary terms) between a competing product's performance and its price. This comparison is better expressed as Anderson and Narus' equation,[3] shown in Fig. 11.5.

The result from each side of the equation represents the monetized benefits that customers receive by adopting one product or the other. Many authors refer to this number as the 'value to customers'.

Performance($)**1**: this the monetized value assigned to Company 1's product/service performance (in dollars, euros, etc.). Performance value is calculated using variables in connection with customer needs. These variables might have to do with functionality(ies) or attributes (see Chap. 2), or they might be logistics variables that have to do with delivery times, ease of installation, etc. Usually, the monetary value assigned to performance is represented as a cash flow. All of this information needs to be gathered during field research. To a large extent, companies need their customer's collaboration in order to express performance value as a monetary amount. Progressive customers will willingly cooperate in this process. Additionally, a supplier must complement this information with research on how much the problem is costing the customer.

Price($)**1**: this is the price of Company 1's product/service offering. Assuming Company 1 is trying to establish a reference price, this is going to be its dependent variable. As the reader knows, a price is a monetary value assigned to a single product unit or service.

Performance($)**2**: this the monetized value assigned to Company 2's product/service performance (in dollars, euros, etc.). In this case, Company 2 is a competitor whose products present the best real alternative to Company 1's products. Company

[3] Business Market Management. Understanding, creating and delivering value. James c. Anderson, James A. Narus. Prentice Hall. 1999.

2's products might fall under the same product category, or they could be substitute products. The same variables used to calculate Performance($)1 are used to calculate Performance($)2 (that is, variables in connection with customer needs). Again, this performance value is usually represented as a cash flow. To the greatest extent possible, this comparison should take into account real-life conditions. This is often referred to as side-by-side comparison.

Price($)**2**: this is the current price of Company 2's product/service offering. A company obtains this information through market intelligence. Generally speaking, it shouldn't be too difficult to find out a competitor's prices.

Given that the purpose of this exercise is to determine the reference price (shown as Price1 in the above equation), an industrial marketer should focus on obtaining the other three pieces of information in the equation: the current price of a competitor's product/substitute, the monetized performance value of the competitor's offering, and the monetized performance value of a company's own offering.

Next, there are two other factors to consider: whether a customer is buying a product or service for a new project (e.g. machinery for a new production plant), or whether they're looking to replace pre-existing equipment, technology or services (e.g. new maintenance services for their computer servers).

In the first instance, a company should use the same calculation criteria (e.g. functionality(ies) and attributes) to compare the performance of its offering to that of direct competitors or competitors with substitute products. This is shown in Fig. 11.6.

This type of comparison is about assessing the performance difference between suppliers 1 and 2. This is illustrated in the equation in Fig. 11.7, which is a variation on the equation shown in Fig. 11.5.

If, however, a customer is looking to replace pre-existing technology, then an industrial marketing strategist will need to compare their company's offering to the customer's *current technology*. Additionally, the industrial marketer should compare competing, or substitute, offerings to the customer's current technology. This is shown in Fig. 11.8.

To that end, a supplier can use the equation in Fig. 11.5 to compare its offering and a competitor's offering to the customer's current technology. This is shown in Fig. 11.9.

Of course, having this information and doing these calculations doesn't mean that an industrial marketer will arrive at an exact, fair price for their offering. These should be thought of as approximations of the reference price.

Sometimes, even when the equation shows that supplier 1's products/services provide greater performance value, customers might still prefer to purchase from supplier 2. There are several reasons why this might be true:

– Customers have a long relationship with supplier 2, which lowers the perceived risks and allows customers to predict the results of product/service performance.
– Supplier 2 has a more liberal credit system and payment policy
– Supplier 2 has a history of success in the target market

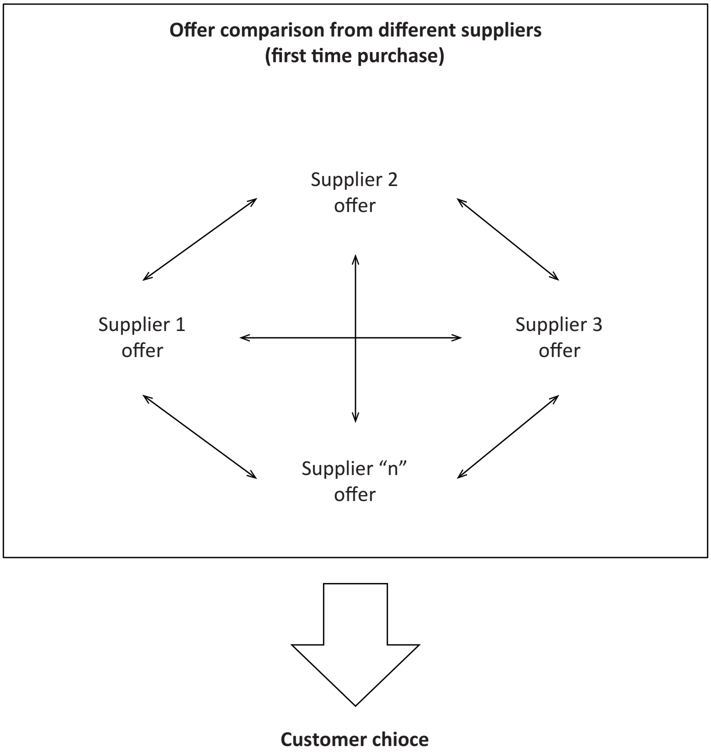

Fig. 11.6 This diagram shows how customers that are embarking on new projects will compare offerings from different suppliers. The customer will want to determine which offering provides the most benefits (that is, the greatest difference between performance and price)

$$\Delta\,\text{Performance}(\$)_{1,2} > \text{Price}(\$)_1 - \text{Price}(\$)_2$$

Fig. 11.7 This equation is an algebraic version of the equation shown in Fig. 11.5. Customers can use the above equation to do a side-by-side comparison between two competitors (1 and 2)

Most likely, if products are commoditized, there won't be much of a difference between one side of the equation and the other (complementary services may account for any differences). Or, put another way, when equations are finally thrown off balance, it's usually because of new products or new substitutes. As everyone knows, the *momentum* that outstanding new products have when they first appear in the market can draw customers away from more established or traditional suppliers.

It's interesting to note that thus far, the reference price isn't determined by manufacturing costs for products 1 and 2. Except for a few cases, products that provide better performance for a particular application are more expensive to develop and produce than products with inferior performance. Naturally, this assumes that both products are in similar stages of their life cycle, and are being produced in similar volumes.

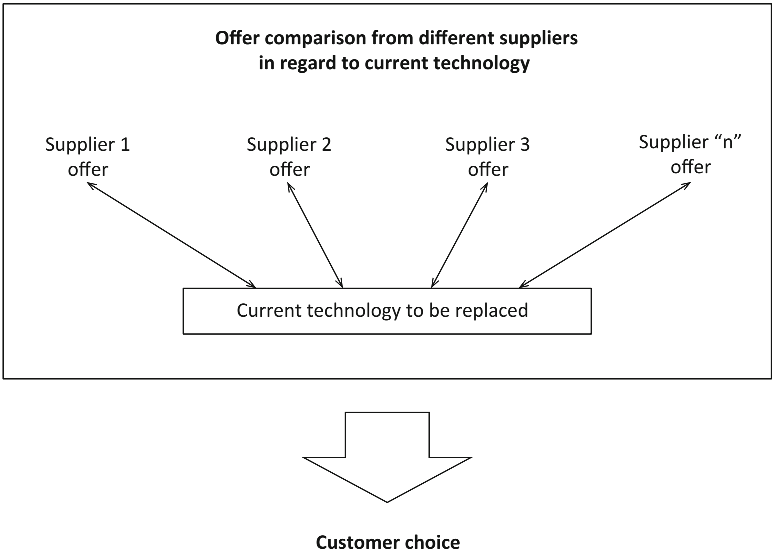

Fig. 11.8 If a customer wants to replace its current technology, then a supplier will need to do multiple performance and price comparisons in order to determine the best price. In this case, the customer's current technology serves as a reference point

$$\Delta\ \text{Performance}(\$)_{1,\ CT} - \text{Price}(\$)_1 > \Delta\ \text{Performance}(\$)_{2,\ CT} - \text{Price}(\$)_2$$

Fig. 11.9 In this case, companies 1 and 2 need to compare their product/service performance to the customer's current technology, or CT (this is the technology that the customer wants to replace). Both companies (1 and 2) will need to identify any important variables in connection with customer needs. Then, they should do a side-by-side comparison and assess how well their product/service performs relative to the customer's current technology. From there, this equation follows the same procedure as the equation in Fig. 11.5

It's also interesting that in each and every case, suppliers are going to use the same equations shown above. A progressive supplier that makes high-tech, high-performing products will need to determine their product's performance value and compare it to the most viable alternative (this could be a competing product, or a substitute). Market followers, in turn, have to do the same kind of calculations; they'll need to compare themselves to the market leader and figure out how much lower their reference price needs to be in order for customers to take an interest in their product.

Common Mistakes in Value-Based Pricing

(a) Companies forget to compare the performance of their product/service to that of a competitor's. Many companies use a flawed version of value-based pricing. What this means is that an industrial marketer is only using two variables to determine the reference price: the cost of the problem and the performance value of the company's own product (essentially, it's as if the marketer were only working with half of the equation shown in Fig. 11.5). This is a mistaken approach to VBP and it doesn't take into account the fact that customers will compare offerings from numerous possible suppliers. Out of this wide pool of suppliers, some will be using VBP on very high-tech products, while others will be using cost-plus pricing on low-tech products. This means that for customers, there may be significative variations in prices.

A company needs to remember that its offering is always going to compete against other products or substitutes. The company won't be able to properly calculate its reference price unless it knows how much these competing products cost and how well they perform.

(b) Companies forget to compare their product/service to relevant *substitutes*: substitute products and services aren't just abstract ideas that appear in marketing textbooks. Substitutes are real alternative solutions to a customer's problem. The companies that make substitute products/services could be just as talented and proactive as one's own company. And, they'll be just as hungry to sell more.

Unfortunately, a lot of executives get fixated on their company's direct competitors, and they set the prices for their products/services without stopping to consider or analyze substitutes. This myopia can have grave consequences; for instance, a company could permanently lose its market share in certain important applications (e.g. the case of busbars versus electrical conductors in tall office building applications). In order to use value-based pricing, an industrial marketing strategist needs to constantly assess and consider the performance of substitute products. Additionally, this kind of technical evaluation provides companies (or even an entire industry) with up-to-date market intelligence about any potential threats posed by substitute industries.

(c) Companies rely on *intuition* to decide which variables are important for measuring product/service performance. Some industrial companies that use VBP naively take for granted which of the required performance attributes or functionalities are the relevant ones for assessing their own products and those of a competitor. This kind of office-based VBP is even more flawed when a company hasn't clearly established what type of applications its product is meant for.

(d) Companies calculate their VBP for a general market, even when their product provides different levels of benefits for different market applications. This is a sensitive topic, and it's already been discussed above. Essentially, a single product design can provide different types of benefits depending on how it's applied (of course, an industrial marketer will need to ask themselves whether a product requires greater specialization). In this sense, it's completely legitimate for a company to price a product differently depending on how it's going to be used. However, this kind of pricing strategy doesn't work for products that are displayed to the public at large, such as OTC products, or for products that are distributed via third-party intermediaries. Rather, it's meant for situations in which a company's sales force gets actively involved in a customer's project from the very beginning, and offers customers one-on-one price quotes. Likewise, it can also be used in certain types of distribution, such as parallel distribution or distribution via application specialists.

The Limits of Value-Based Pricing

Value-based pricing requires a company to step outside of its office and gather precise, detailed field information. This takes time and experience, and as a result, it makes it harder to respond to customers that are only looking for a quick, referential price quote (this is always a risky thing to provide without due consideration).

Just to reiterate: in order to use VBP to develop reference prices, companies first have to identify different customer needs for different applications, convert that information into metric form, assess their product's actual performance in relation to those needs, and finally, as if that weren't enough, do a proper comparison between their product and other competing products or substitutes.

Some industrial companies, however, manage hundreds, or even thousands, of different products. It would be practically impossible for these companies to keep track of all of the different variables that go into value-based pricing. Effectively, these companies have to 'part the waters', with VBP products on one side, and products with a price list on the other. Ideally, price lists should be drawn up over time and should be based on past VBP data.

Thus, so long as companies have time and the right information, they should be able to implement proper VBP. This is generally the case when customers are requesting a made-to-order project, or when a company is introducing a new product or service into the market.

Another significant limitation to VBP is that a company's direct competitors may be so desperate to obtain a purchase order for a large-volume project that they resort to cost-plus pricing. Remember that the competitor's price is a key factor in VBP, meaning that if a competitor's prices are much lower, then it can distort a company's own reference price calculations.

Value-based pricing also requires a sophisticated, intelligent, and proactive sales force. Even though the marketing department is usually responsible for setting prices and communicating them to the sales force, the sales force should fully understand the idea behind VBP and they should be able to educate customers about the benefits of using their product (thus justifying the price). A complacent, lazy and technically deficient sales force, one whose main focus is large-volume purchases, won't be able to educate customers about the product's characteristics or explain its VBP. As such, a company could spend a lot of effort developing and producing a product, only to have the product sold as if it were a 'sack of potatoes' by a deficient sales force. Naturally, the Chief Commercial Officer is the one that determines what kind of professional traits the sales force needs to have and what kind of incentives they should be given (see Chap. 7).

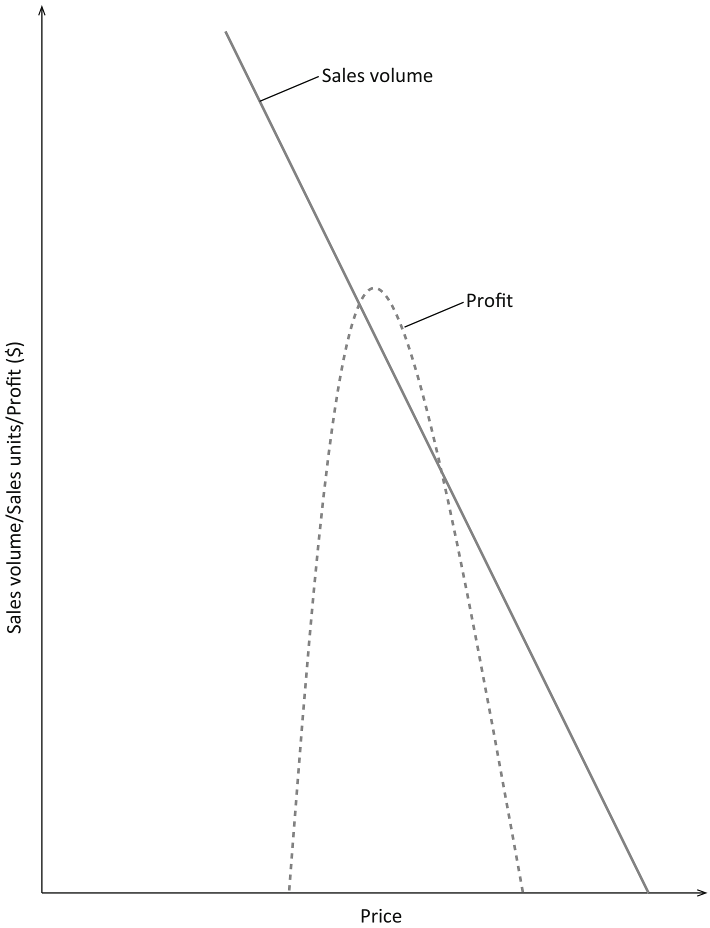

Fig. 11.10 The *solid line* represents the price-response curve for a mass-produced product. Through proper research, an industrial marketing strategist can determine customers' price sensitivity. The *dotted line* represents the company's profit curve. As can be seen in this graph, there's a small window in which a company can maximize its profits. This graph will serve as a base case to show the effects of value-based pricing on sales and profit when other variables are affected (see Fig. 11.4). *Source*: Power pricing. How managing price transforms the bottom line. Robert J. Dolan, Hermann Simon. The Free Press. 1996

Using the Reference Price to Create a Price Band

Once a company has established a reference price and price band, it needs to assess how these relate to its product costs. The price-response curve in Dolan and Simon's[4] graph helps illustrate this relationship. Figure 11.10 shows the price-

[4] Power Pricing. How Managing Price Transforms the Bottom Line. Robert J. Dolan, Hermann Simon. The Free Press. 1996.

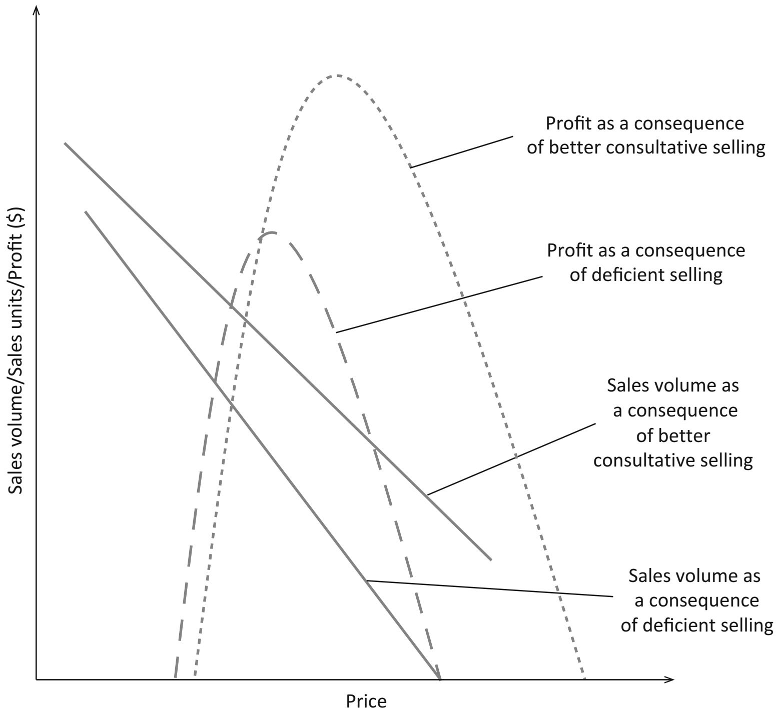

Fig. 11.11 The profit curve and price-response curve can be thought of as dependent variables; both of these variables are influenced by the quality of the sales force

response curve together with the profit curve. In practice, when a company's prices are too low, its sales increase, but its profits decrease and the company could even end up losing money (see Fig. 11.1). Too high a price, on the other hand, decreases the amount of demand for a product, and, given the decrease in sales, this means less profits. Dolan and Simon show that in each case, there's a narrow window of maximum profits.

Before entering into a more detailed discussion on the relationship between price-response and the reference price (discussed above), it's important to consider the following:

– Without a proper consultative sales force, VBP is very difficult to implement, if not impossible.[5] This means that the shape, position, and slope of the price-response graph are things that a company has some degree of control over. For instance, the quality of a company's sales management will affect the slope and degree of customers' price sensitivity. This is shown in Fig. 11.11.

[5] Value Merchants. Demonstrating and Documenting Superior Value in Business Markets. James C. Anderson, Nirmalya Kumar, James A. Narus. HBSP. 2007.

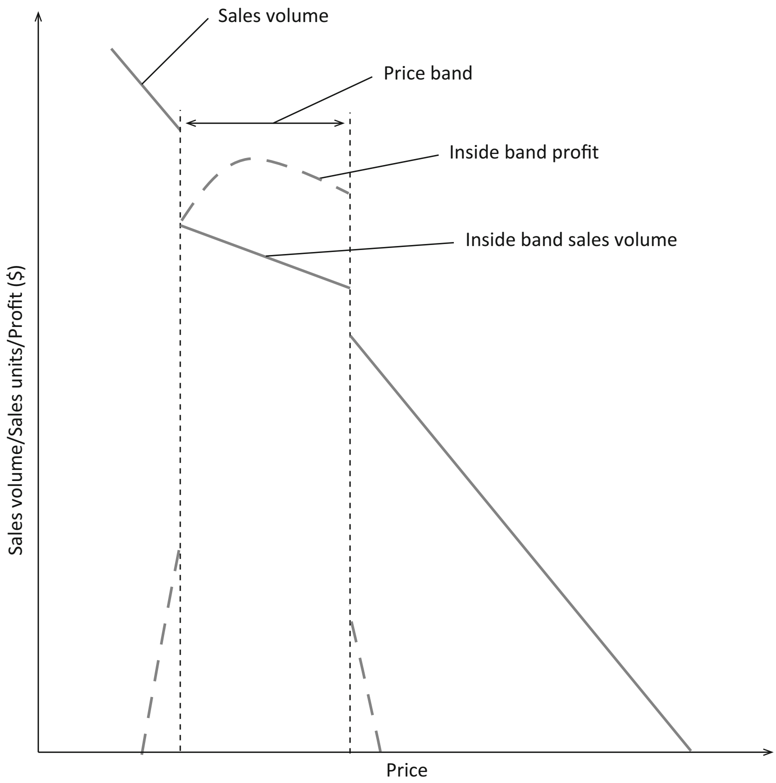

Fig. 11.12 An illustration of the effects of value-based pricing, combined with proper consultative selling techniques and proper market segmentation (according to product application). These last two are essential ingredients for correct usage of VBP. As evidenced in the graph, the effects this has on the sales and profit curve within the price range are beneficial for the supplier

– The reference price (which is obtained through VBP) for a product promoted by the sales force will set the target price, and this, in turn, defines the profit curve. In other words, the reference price determines the highest point on the profit curve.
– If companies use a reference price, they'll generally get a higher maximum profit curve than if they use cost-plus pricing.

In Fig. 11.12, the reference price and price band are superimposed onto the price-response graph. It's important to point out that this graph is based on the following assumptions:

– The product in question is mass-produced. This model may also apply to made-to-order products, but only so long as they're manufactured in large-volumes.
– The company has properly segmented its market and the sales curve accurately reflects the buying behavior of target application customers.

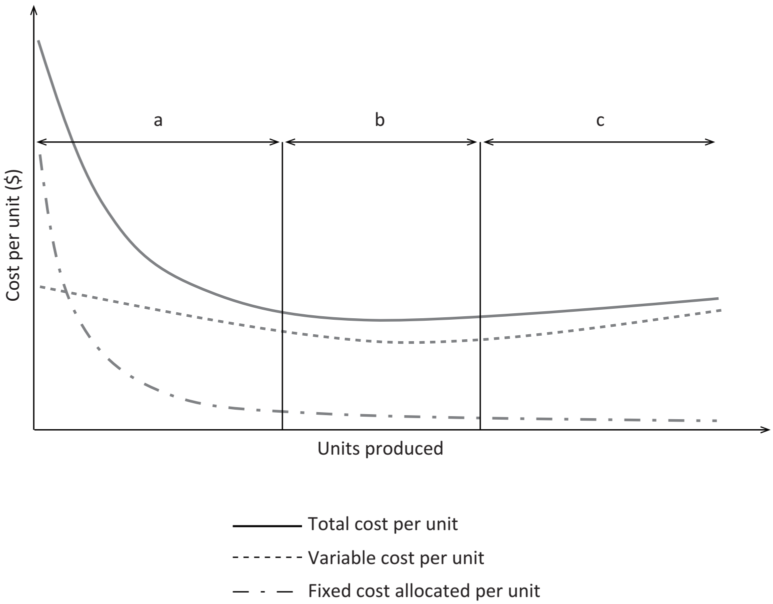

Fig. 11.13 This graph depicts changes in a product's unit costs; it compares the product's fixed unit costs, variable unit costs, and total unit costs. The total unit cost decreases considerably in zone a; in zone b, it's more or less stable; in zone c, it experiences a slight increase. The slope of these curves will be different for each company, since each company will have its own production and administration procedures

When analyzing this graph, there are a few things that stand out:

– Proper consultative selling can have a positive effect on the sales curve within the price band. This is shown in Fig. 11.12.
– Proper consultative selling can have a positive effect on a company's profit curve within the price band.
– When an industrial marketing strategist compares VBP to cost-plus pricing, they'll find that the price-response curve has a higher maximum point and is less steep. Likewise, VBP generates a higher and wider profit curve. As can be seen in the graph, this profit curve tends to begin further to the right than the profit curve for cost-plus pricing. This is because, with consultative selling and more sophisticated marketing techniques, the indirect costs associated with VBP are higher (if only marginally).

Volume Discounts

It's tradition for industrial suppliers to offer their customers volume discounts. The problem is that there usually isn't a clear or logical way to calculate and justify these discounts. Figure 11.13 depicts common changes in a product's unit costs (the cost

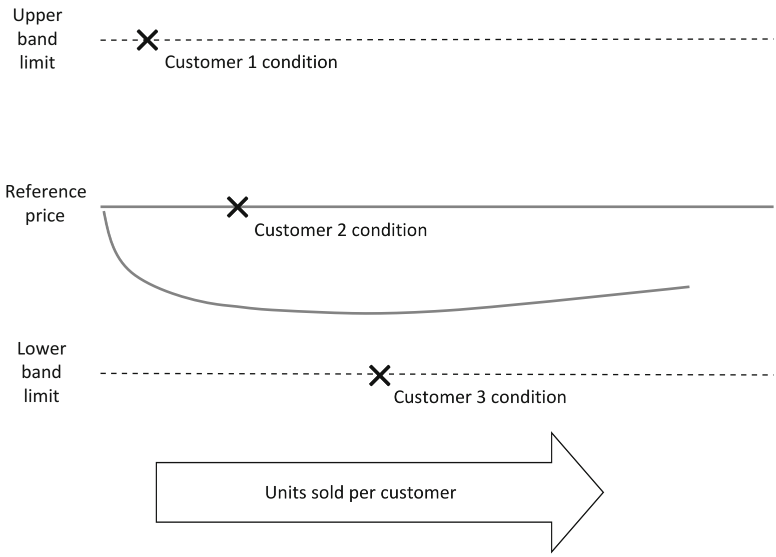

Fig. 11.14 This graph provides a pricing model for determining final prices in situations involving volume discounts. This proposal is based off of the reference price (calculated with VBP) and the changes in product unit costs shown in Fig. 11.13

of producing and selling one unit of a product); it compares the product's fixed unit costs, variable unit costs, and total unit costs.

Companies that only consider their fixed costs when calculating volume discounts can end up committing a serious calculation error. Effectively, at a certain point, the more volume a company sells, the more costly it might become for them. To calculate volume discount, an industrial marketing strategist needs to familiarize themselves with a product's fixed costs and variable costs within zones a, b, and c in Fig. 11.13.

In order to begin determining a final price, an industrial marketer can refer to Fig. 11.14. This is just an initial approximation. To set the final price, an industrial marketer has to consider a whole host of other factors, such as: any additional services that go with the product, cross-selling, changes in the amount of services and support that customers require over time, strategic sales (e.g. market penetration), sales in international markets, payment conditions, and any other circumstances relating to product's usage conditions.

Chapter 12 deals more extensively with how to price new products.

The Price List for Industrial Products and Services

Industrial companies with standardized products or services often use a price list. The layout and structure of these lists can vary considerably from company to company. For the most part, however, they generally consist of a vertical list of products and a horizontal list of different prices for different commercial conditions.

For instance, these conditions might have to do with purchase volume (and any volume discounts), additional services that go with the product, product modifications, payment conditions, etc. Price lists are relatively easy to administrate and they can be consulted quickly. Given how simple and easy they are to use, and the fact that they're always readily available, price lists are very popular amongst companies that want to avoid calculating prices on a case-by-case basis.

Likewise, if customers are only looking for a quick or approximate price quote, then the price list benefits them as well. There are a lot of advantages to using price lists if a manufacturer has a lot of products and/or standardized products.

However, price lists can also be a double-edged sword. The following is a list of key things that supplier companies should avoid:

– Creating price lists using cost-plus pricing: the prices on these lists should be calculated using value-based pricing information compiled over time. Otherwise, a company runs the risk of creating a simplistic price list, one that doesn't account for customers who receive significant benefits from a product and would be willing to pay the fair price. Based off empirical evidence, cost-plus pricing tends to result in prices that are lower than they should be.
– Price lists that don't differentiate between different product/service applications: as discussed earlier, a single product has different benefits for different applications. When there's only one price for each product, a company may end up providing non-specific price quotes to customers in different applications. Just as before, this results in prices that are lower than they should be.
– An oversimplified price list that doesn't account for the complexity of the product mix: many industrial companies try to simplify their price list by grouping together similar products into product families, thus overpricing certain products and underpricing others. Given the sheer volume of products and sales that industrial companies are dealing with, the more detailed a price list the better.
– Fixed price lists that don't adapt well to the market: companies expend a huge amount of energy designing and assembling their price list. Once they've put it together, it can be tempting to 'frame it' and hang it on the wall for permanent use. While some companies adjust their prices to match regional inflation rates, this in itself is not enough. Companies that aren't accustomed to doing ongoing, detailed market research can easily let 6 months (or more) go by without doing field research on their customers, competitors, substitutes, etc. This leads to stagnant price lists that quickly go obsolete. Companies need to constantly update their price lists to match changes in target applications. This is especially true for companies whose products have short, or intense, life cycles.

The Price of a Product and the Cost of Its Service Life

Some authors maintain that since the 1970s, the global rate of radical innovations has gone done.[6] Others even go so far as to say that human beings have reached a technological plateau.

No doubt, there are far too many industrial products and services that resemble each other. In order to reconcile the huge amount of price competition between incredibly similar products, some suppliers have started distinguishing between two types of prices:

– Initial cost. This is the initial price that a customer pays when they purchase a new product.
– Total cost of ownership (TCO). This is the price a customer pays over the course of a product's service life—it accounts for operating costs, maintenance and repair costs, the cost of spare parts, recycling costs, and any depreciations in product value.

Some suppliers argue that their product has a higher initial cost compared to competitors because it has a lower TCO. Conversely, other suppliers take advantage of offering a low initial price, and earn significant profits later on through the customer's TCO. The difference between these two types of suppliers, their initial costs and ownership costs, are represented in Fig. 11.15.

A supplier whose product is more robust and has a lower TCO is concerned about their customers avoiding onerous payments over time. As a result, these suppliers design and develop products expressly for this purpose. In this case, the consultative sales force can use different tools such as cash flow, or demonstrations of lower systemic complexity to educate customers. Customers should learn about the benefits of a product's functionality/attributes and they should be aware of its TCO.

Suppliers that choose to develop products with a low initial cost but a high cost of ownership can appeal to customers that lack the resources to buy the better option. That being said, just because a product has a low initial cost doesn't mean that it will have a higher TCO.

All in all, companies that design products *in order to profit* from them during their service life will quickly find themselves rejected by an increasingly educated and technically skilled market.

[6]The Great Stagnation: How America Ate All The Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better. Tyler Cowen. Dutton Adult. 2011.

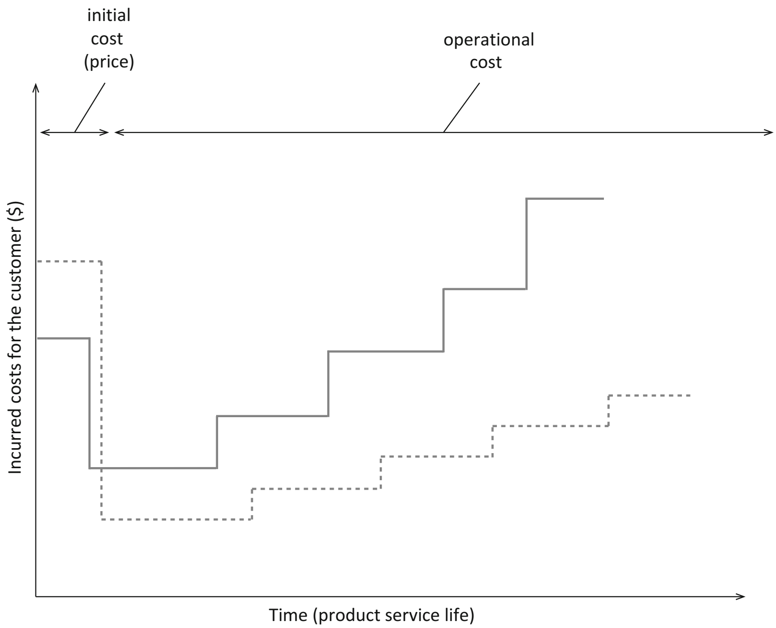

Fig. 11.15 This graph shows the difference between two competing suppliers' initial costs and total costs of ownership. The *dotted line* represents a supplier whose product designs are more robust; while the initial cost of this product is higher, the total cost of ownership is lower. The *black line* represents a supplier whose product is initially cheaper to buy, but over time is more expensive to operate

Introducing New Technical Products into the Market 12

Introduction

At some point in this whole long marketing process, in which a company goes from understanding customer needs to developing a new product, the time comes to start planning the product's market introduction.

In an industrial context, the term 'introduction' is preferable to the term 'launch', the latter being better suited to consumer markets. The word 'launch' seems to imply some kind of event. And, oftentimes, the success of a new consumer product is largely determined by the initial promotional events that take place during its launch.

Conversely, the introduction of a new technical product is a methodical process, one that extends from the heart of the market research program to the final stages of product introduction.

There may be a grain of truth to the cliché that 'a good product sells itself'; yet, if a technical product does sell itself, it will sell *very* slowly. The following is a list of things that customers may not know about an outstanding new industrial product:

- What it does
- How it works
- What it's meant for
- How it helps the customer
- How much it helps the customer
- How and how much it helps the customer's customer
- How its performance compares to competing or substitute products
- It's advantages and disadvantages
- How much it costs
- How much it benefits the customer once the customer has ordered and paid for it
- How to transport, install, and use the product
- The length of its service life

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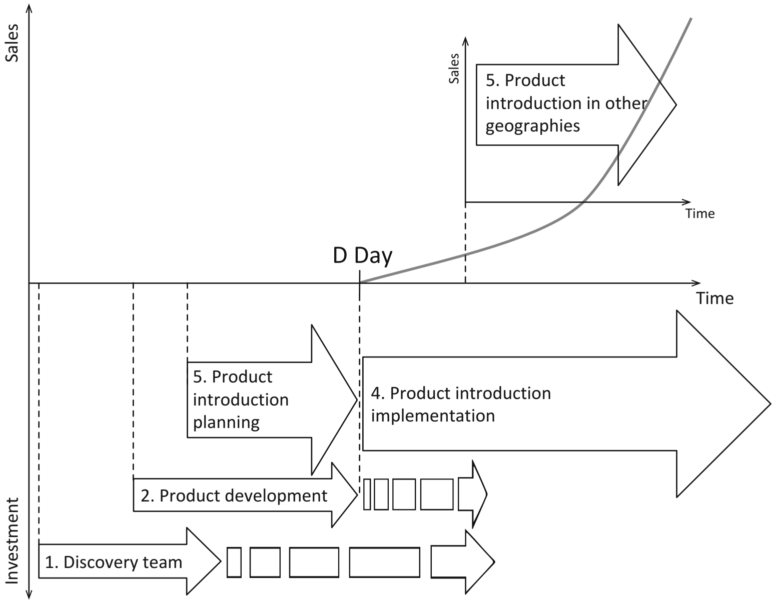

Fig. 12.1 This graph depicts the initial stages of a new product's life cycle (once its been introduced into the market) and the product's sales over time. Stages 1 and 2 consist of the market research and new product development program; company members will continue to work on Stages 1 and 2 during the initial phase of the introduction program. Stage 3 consists of planning the new products' introduction program. D-day marks the day that a new product is ready to be commercialized and delivered. Stage 4 is when a company implements its introduction program (planned during Stage 3). Once a new technical product has been successfully introduced into one market, a company needs to assess introducing it into other markets. Here, the company can either export the same product design or adapt the design to meet other regional needs

- The type of services and repairs it may require throughout its service life
- The reliability of maintenance services and availability of repair parts (these help maintain the product's service life)
- The costs associated with these services and repair parts

Given all of the above, it's important to realize that product introduction isn't a process that begins after product development. It's not as if these major programs occur one right after the other; rather, many of the activities that take place during these programs can be planned and/or executed at the same time. This is shown in Fig. 12.1.

The reason these activities are carried out simultaneously is so that the introduction program can begin as soon as a company has worked out the details of its product concept (or the product idea created during the development program; see appropriate chapter). Meanwhile, the Discovery Team© continues to be intensely active during product development and, especially, in the period following product introduction, when customers use the product for the first time. This allows the product development team to perfect the product during the initial phase of product introduction.

Some authors rightfully insist that companies should formalize their new product introduction program just as they would a business plan. However, this book recommends that companies think of this program more like a *project*, one that just so happens to be structured like a very detailed business plan. The reason it's important to make this subtle distinction is that a *project* is a more concrete, structured and actionable concept, and it connotes a greater degree of urgency than a *plan* does.

This project should employ many, if not all, of the technical marketing tools already discussed in this volume. As a general rule, the product introduction process tends to be expensive, demanding, and lengthy, and it can become even more protracted (perhaps interminable) if a company lacks a coherent method or system. Without wanting to be overly dramatic, it's reasonable to say that any mistakes made during the introduction program can ruin a company's chance of demonstrating the benefits its product provides, effectively dooming that product to failure. Given the above, a company should create a budget for its introduction program during the feasibility analysis stage (which takes place prior to product development; see Chap. 6).

The biggest misconception that an industrial company can have about new product introduction is that it's simply a matter of 'selling products more aggressively' via their standard set of personnel, integrators, channels, and procedures. This means that when a product doesn't sell well, it gets 'blamed' on the sales force or the distributor, or on the integrator, or user that didn't know how to value the new product. This misconception ignores key features of any new product introduction program: namely, that these programs are multidisciplinary, follow a plan and protocol, have formalized checkpoints, are conceptually complex, are imbued with a sense of urgency, are lead by a well-respected executive, and are considered extremely critical by company higher-ups.

Introducing a new technical product into the market marks the beginning of the rest of a company's trajectory. In a sense, it's like the creation of a whole new generation, one filled with promise. Without it, a company would already be on its way to a slow or speedy death.

Things to Consider Before and During the New Product Introduction Program

Before delving into a practical discussion on the product adoption process and the specifics of an introduction program, both the industrial marketer and the New Product Introduction Team (or NPIT) should take the time to seriously consider the different requirements for planning and implementing an introduction program.

A company needs to have clearly defined its target applications and characterized these applications in detail. This is a necessary prerequisite for the new product introduction program. A company should not be trying to do last minute research on its customers' interest in the new technology (see chapters on industrial market research and industrial market segmentation), on who the technology is for, where these customers are located, what they're like, how many customers there are, who the competition is and what these competitors are like, what substitutes there are and what these substitutes are like, and/or any market trends that affect their target application customers.

When target applications and potential customers aren't properly characterized, companies end up with excessive promotional efforts and expenses, and wasted time. This only lengthens how long it takes to mount a successful introduction program. Of course, this assumes that the company doesn't decide to abandon the project, given its apparent lack of success.

The real customer is always the end-user! If there are intermediaries, their interest in purchasing the new product is directly related to how the product benefits end-users.

A company needs to have a *core* design and modular architecture for its product/service. This allows the product/service to be easily adapted to different customers' usage conditions. Although this is the responsibility of the product development program, the industrial marketer should realize that if a product/service isn't adaptable to different environmental, geographic, integration or usage conditions where it may be used, then it could end up being very costly for customers, intermediaries, and even the supplier. This is what is known as modularity; it's a type of configuration that allows different accessory attributes to be modified, thus ensuring that a product/service can function properly under different conditions. However, modular products/services need to have a core design, which allows a company to produce them efficiently and guarantees their effectiveness. Assuming that a product goes through integrators before reaching the end-user, the supplier needs to plan and coordinate with these intermediaries and provide ongoing training. All of these activities are crucial to the success of the new product.

A company should have a clear understanding of how important their offering is to the customer. A lot of manufacturers think that their product is at the center of the universe. This deluded sense of self means that their strategies and activities will be rather clumsy, and either over or undersized. The diagram in Fig. 12.2 shows that different products or services can be *strategic* or *critical* (or both or neither).

According to this diagram, an industrial supplier's products/services can be classified based on four possible categories:

New products that are both strategic and critical (e.g. the active component in a compound that gives a customer's product its functionality) will naturally capture customers' attention.

New products that are (for the time being) neither critical nor strategic (e.g. common printer paper used at a customer company) require a company to find creative ways of building customer awareness.

New products that are critical but not strategic (e.g. energy, the rolling bearings used in motors at a factory, etc.).

New products that are strategic but not critical (e.g. business strategy consulting, organizational design, etc.) will be more or less attractive to customers depending on each customer's individual circumstances.

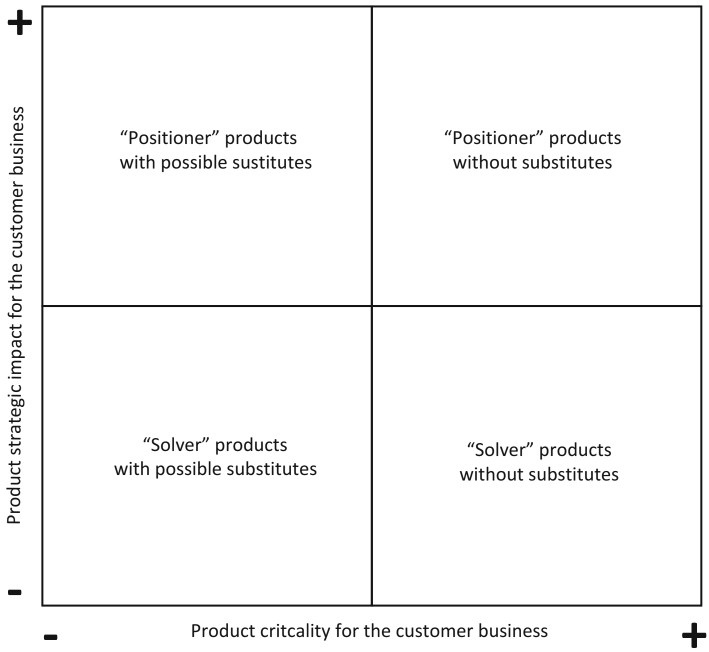

Fig. 12.2 This diagram shows how critical, or important, a product is for a customer's business. The variable 'criticality' refers to how essential a product/service is for a customer's business operations. However, 'criticality' alone doesn't mean that a product is also strategic. The other variable, 'strategic impact', refers to a product/service's ability to improve a customer's standing with *its own customers*

It's important for industrial marketers to realize that customers may be more resistant to adopting new *critical* products. This is precisely because of the criticality and business risk involved in this kind of decision. Moreover, a company's decision to purchase and use a strategic, yet non-critical, product is influenced by that company's organizational culture, business history, and the power exerted by some of its leaders. Whatever the case may be, when a company is introducing a new technology, strategic/critical products have a definite advantage over products that are neither strategic nor critical. Naturally, the latter type of products face greater competitive pressure during the educational campaign for customers.

Companies that provide non-strategic and/or non-critical products should always be aware of the relative importance of their product. Companies that forget this will soon find that they're bitterly asking why their new product introduction has taken three to five times as long as they had originally budgeted for and committed to.

Additionally, when a manufacturer develops a new product or service, their professionalism requires them to recognize any performance gaps between their offering and their target customer's needs. This is true both for minor improvements to an existing product as well as for revolutionary new products.

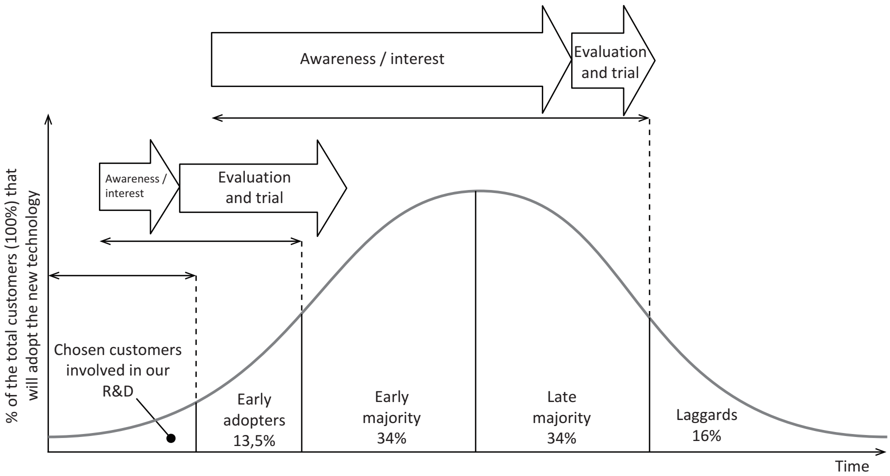

Fig. 12.3 This *curve* shows different types of adoption categories for a newly introduced product. The information in this graph is supported by empirical evidence from industrial markets. The graph itself shows five categories of adoptive customers over time and their respective market shares. The difference between these categories has to do with when customers adopt a product. The first category consists of 'innovative customers', and it refers to customers that may have actively participated in the product development process. The *upper arrows* show that, given the risks associated with early adoption, the 'early adopters' and 'early majority' will generally spend more time on the 'evaluation' and 'trial' stages in the adoption process (see text). Customers in the 'late majority' and 'laggards' categories take longer to 'develop awareness' and 'interest' in the adoption process; however, once the technology has been widely accepted by the market, these customers spend less time in the 'evaluation' and 'trial' stages of the adoption process

A company needs to have collaborated with key customers during its product development program. No matter what, even if an outstanding technology is developed by pure happenstance in a laboratory, having a select group of users or integrators participate in a company's product development program will make new product introduction that much easier. The leading developer company should agree to provide these customers with more favorable commercial conditions in the event that the development project results in a functionally successful product. In return, the customer will have signed a confidentiality agreement, and may end up providing the supplier with an early user experience. Undoubtedly, this select group of customers are the true *innovators* in Francis Bourne's adoption curve. See Fig. 12.3.

The reason for this is that during the initial phase of the introduction program, a company inevitably hears one question over and over again: How and where has this product successfully been used in the past?

If a product represents a substantial financial investment or has the potential to become a strategic asset for customers, then customers will usually want to visit facilities where the product is being used and discuss the product with its real users.

An introduction program requires an executive leader whose opinions and leadership are well-respected within the organization. On top of all the technical and conceptual tools that are used to introduce a new product, the introduction process requires a lot of effort, coordination, and a sense of urgency. Obstacles will inevitably appear, and when they do, they'll require fast, yet thoughtful decision-making, executive solutions, and the injection or mobilization of additional resources.

The introduction program should be lead by someone who other company members will listen to closely, not by someone who thinks this is just a 'fun or entertaining' job to do (although, admittedly, this may be one of the most thrilling jobs within the company). Additionally, this executive leader is responsible for serious, quantifiable commitments; they know that while they'll be blamed for failure, they won't be glorified for success. The success of a new product is attributed to the people who participated in market research, prioritized the idea, designed and developed the product, and, naturally, implemented a successful introduction program.

Upper management (the General Manager and company directors) should pay close attention to the introduction program. As discussed previously, an industrial company needs the kind of upper management that's going to 'roll up its sleeves' and get out into the field. Industrial manufacturing companies have a *relatively* low number of products. As such, the success or failure of any one of these products is vital for the company's future. How could someone possibly justify upper managers not being intensely involved in the methodical stages of new product introduction? Or, put another way: what could upper managers possibly be spending their time on that they're not able to pay attention to a process that so directly determines the future and reputation of their company?

Excellent project management skills. Companies that aren't used to planning, implementing, and exercising disciplined control over their projects put themselves at enormous risk: they could end up with a haphazard introduction program, an introduction program that never materializes, or their competitors might discover what they've been working on and take better advantage of the opportunity. Calling the introduction program a *project* makes it more formal, and gives it a greater sense of urgency and purpose, as well as goals, tasks, responsibilities, budgets, and deadlines. This is especially true for activities that take place following D-day (see below).

The project's key personnel should be exclusively dedicated to the introduction program. As the reader is about to find out, new product introduction is extremely complex: not only is this where all of the marketing and sales concepts discussed in this book converge, but it also involves a huge amount of other details where the *slightest mistake* can put the entire project at risk. No doubt, it's one of the most intense activities that the industrial marketing department is responsible for. Orchestrating all of these operations, especially if a company is introducing several products at once, constitutes a full time job for people in the marketing department.

A new product introduction program requires financial resources, time, and talent. Odds are, the companies that don't budget time and resources for the introduction program are the same companies that think once the product is manufactured, all that's left to do is 'go sell it'. The budget for an introduction program should set aside resources for certain commonplace introduction activities, such as: discounts and product trials for *early adopters*, specialized sales tactics which might include incentives and travel expenses, participation in industrial trade fairs, preferential terms for key distributors, technical training for customers and intermediate companies, promotional/technical seminars for potential customers, Discovery Team activities during the initial stages of new product use, product set-up, resident engineers, guarantees, unexpected repairs or replacements, equipment for on-site product demonstrations, incentives for integrators, other costs that the supplier assumes responsibility for even though they may be due to customer misuse of a product, etc. These investments are a matter-of-course for companies that plan ahead, yet they can be surprising and frustrating for those that don't. A lack of resources commitment can send the wrong signal: that the product itself is a failure.

A new product introduction program requires planning, **checklists**, **and realistic thinking**. A company should think of their introduction program as a protocol for which real-life details can ruin the entire project. Please consider the following scenario: company employees that are working from their offices to develop a plan for getting a new product to new customers in unfamiliar territory. These employees may come up against numerous, diverse, and unfamiliar problems. As a result, the NPIT should refer to other companies' experiences, and any preexisting protocols and checklists in order to create their own. The Discovery Team can help the NPIT gain a better understanding of their customers' environment and of the physical and administrative path that the new product will travel. Frequently, NPIT members may need to conduct their own fieldwork.

A creative new product requires an equivalent amount of commercial creativity. There's not a single procedure, protocol, or methodology that can anticipate the vast number of conditions and circumstances that new products and services are bound to encounter. There will be unexpected problems and unforeseen opportunities. Adapting plans and procedures, or even inventing entirely new ones, requires the NPIT to be creative. This creativity might be required at any stage and at any moment: from financing to distribution, logistics, or the pricing policy. This, then, is a call to action: the NPIT needs to receive support from professionals with creative and unconventional thinking skills. This will help the NPIT navigate these problems and opportunities and take full advantage of them.

A company should have the resources and mental flexibility to quickly change course in case of any sudden, **unexpected events**. Both the NPIT as well as the rest of the organization need to face an inexorable fact: many things won't go according to plan. This could be due to human error, or technical or systemic issues. Thinking about these things ahead of time is part of good planning. This is where plans B and C come into play. Likewise, a company should have a mitigation plan and a damage control plan, and should discuss the costs associated with these plans ahead of time.

A company should try to anticipate and plan for any situations that might arise during the introduction program, even those caused by third-parties. Above all, a company should remember that its introduction program has to be successful;

anything that threatens the success of this program is the company's responsibility. To give a few illustrative examples, these situations might be caused by: a user improperly handling a product, using a product for the wrong applications, a loss of rapport with distributors, a loss of rapport with suppliers, illegal copies, loss of key personnel, unforeseen product defects, etc.

A company needs to be aware of the appropriate time-window for introducing its product/service (**if applicable**). There are numerous cases in which the timing of an introduction program factors in to its success. As such, it's something that the supplier should carefully consider. Introducing a product at the right or wrong time can have a huge effect on its adoption rate. For instance, if a new technology improves the quality of customers' products, yet also makes these products more expensive, then it would be a bad idea to introduce this technology at the start of an economic recession. Conversely, if a new technology lowers supply costs without impinging upon the finished product's performance level, then it might be readily adopted under these same circumstances. Of course, not all new products have a specific time-window in which they should be introduced. In the majority of cases, products can be introduced at any time, and the sooner the better.

The Adoption Process: The Stages Leading Up to the Purchase of New Technology

Companies know that both they and their customers play a role in the process leading up to new product adoption and, undoubtedly, this affects how companies act. Traditionally, this process has been divided into five stages: (1) awareness, (2) interest, (3) evaluation, (4) trial, and (5) adoption.[1] However, since this model deals with each of these stages separately, its practical value is limited.

This book argues that although an industrial marketer should be aware of these five stages, he/she should never plan commercial activities as if these stages were isolated or independent of one another. When companies treat these stages as separate 'blocks', they run the risk of losing their target customers' interest and sense of urgency in adopting the new technology. In other words, it gives customers enough time to forget their product awareness or look for inferior alternatives during the interest stage, it tampers customers' curiosity during the evaluation stage, and, when the company fails to do follow-up during the on-site trial, customers end up losing faith in the company's technical competences.

This proposal shouldn't be confused with persistent and manipulative sales. Above all, it puts emphasis on the content of a company's customer communication program. Below, the reader will find a detailed description of a simplified version of this process; this simplified version consists of two stages, (1) awareness/interest, and (2) evaluation/trial.

[1] Diffusion of Innovations. Everett M Rogers. New York: The Free Press, 1962.

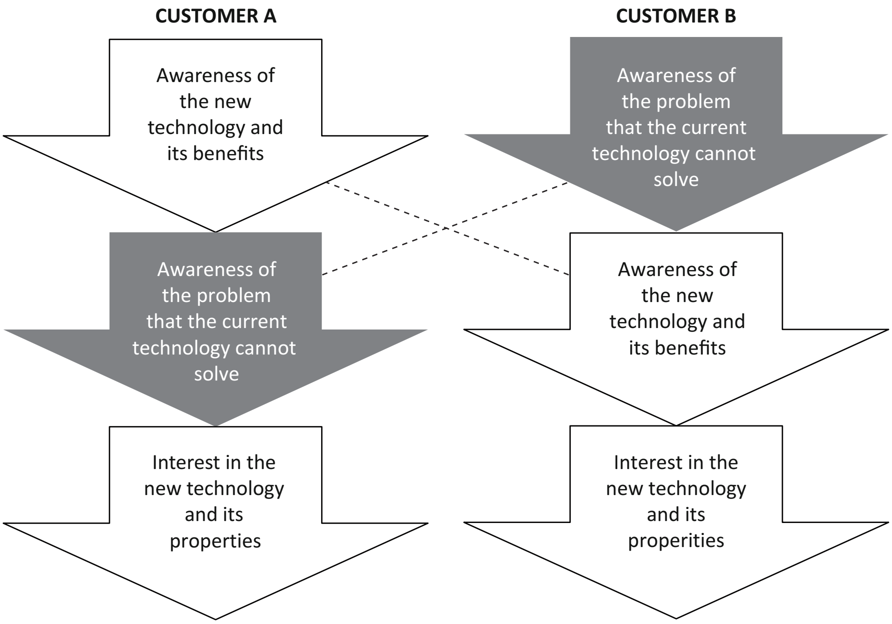

Fig. 12.4 This diagram shows the mental processes of two different customers that share a similar problem/challenge, thus making them both target customers. Customer A becomes aware and learns about the new technology. This causes Customer A to *become aware* of a previously unknown business *problem*, which Customer A can now research and assess. Once Customer A has confirmed that the problem exists and needs to be taken seriously, then the supplier can help Customer A develop an *interest* in the new technology and its characteristics. Conversely, Customer B has known about the *problem* for a while, and may even have discussed the *need* for a solution with various suppliers. When the new technology appears, Customer B will have no problem advancing through the *awareness* and *interest* stage, which makes a progressive supplier's promotional work that much easier

The Awareness and Interest Stage

The following discussion on the *awareness* stage will focus on user-customers that are exposed to a new *product concept* for the first time (as opposed to customers that are selected to help develop and test out a new technology).

The *awareness* stage is widely understood as the stage in which a potential customer develops awareness of a technology and its characteristics. The supplier lets customers know that the technology exists, has been proven to work and what the technology consists of. Moreover, the supplier also demonstrates the benefits the technology provides for certain target applications. For a lot of customers, their awareness of the new technology leads them to discover the *problem* with their current technology (that is, if this technology exists). See Fig. 12.4. Other times, customers may have known about a problem for a long time and may have learned about the new product precisely because they went looking for it. In both

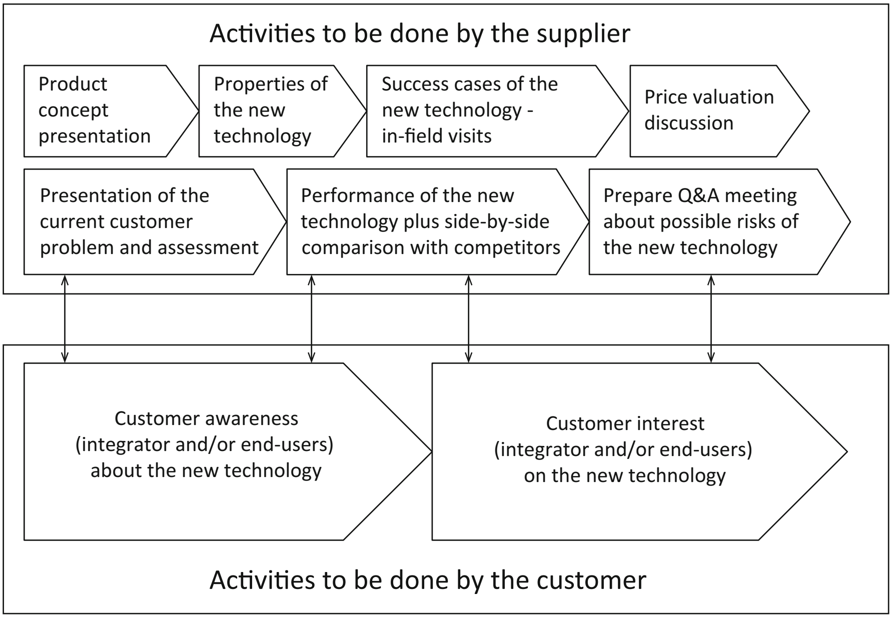

Fig. 12.5 The ongoing process of building customer awareness/interest. This iterative process means that a supplier should educate and provide demonstrations to customers throughout these two stages. Moreover, a company should avoid any interruptions in their promotional efforts between these stages

cases, the customer can subsequently work with the supplier to outline their need for a solution.

The practical implications of these stages are that they allow the sales force to build a customer portfolio of early adopters and the company to design an educational program for potential customers. Given that industrial customers are technical by nature, odds are that for critical or strategic products, the awareness stage isn't separate from the interest stage. Unfortunately, a lot of industrial suppliers spend an excessive amount of time and resources developing customer awareness; they don't realize that their industrial customers are able to quickly develop a deeper understanding of the new technology. In order to promote this 'deeper understanding', suppliers should discuss their product's functionality and attribute performance with customers, and provide a side-by-side comparison between their products and their competitors' products/substitutes, etc. See Fig. 12.5.

Remember that a company needs to have properly segmented its market according to target applications; this is a *sine qua non* requirement for properly introducing a new technical product into the market. As such, there shouldn't be a substantial time gap between the awareness stage and the interest stage. A supplier's detailed description of target applications should include important information on the current technology that the new product is meant to replace.

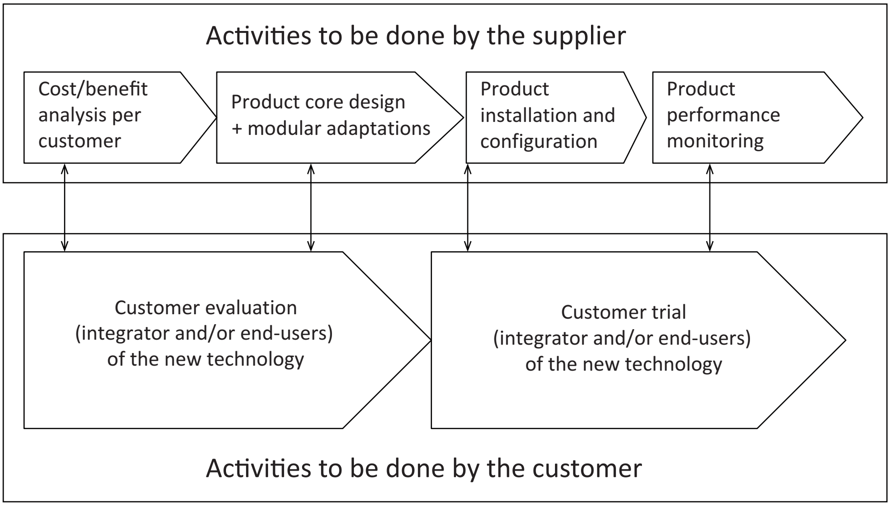

Fig. 12.6 This book proposes that the evaluation and trail stages be treated as a continuous, iterative process between the supplier and target customers. If market segmentation based on application has been done correctly, then the customers in the evaluation stage are potential candidates for the trial stage. If there's a time gap between these two stages, then potential customers could lose focus and turn their attention to their day-to-day activities, which only serves to draw out the adoption process unnecessarily. A manufacturer should approach these stages with a sense of urgency and it should have enough available products for customer trials. Moreover, the manufacturer should teach customers what to expect from the product, how to handle it, as well as about any product improvements that are typically made during this stage

The Evaluation and Trial stage

Just like the awareness/interest stage, it's important for an industrial marketer to treat evaluation/trial as a single stage. See Fig. 12.6. However, he/she should also realize that potential customers will *experience* the evaluation and trial period as two different stages.

Traditionally, people describe the evaluation stage as the stage where a customer does a mental assessment of the costs and benefits that a new technology would bring to their business. As noted in this chapter, this stage also involves a lot of the information and tools discussed in previous chapters, such as research into the costs and metrics of a customer's current problem, or the creation of performance and economic benefit metrics for a new technology or possible substitutes.

Just as its name suggests, the trial stage is when the customer takes the final step in the adoption process and agrees to have the supplier install the new product or service, configure it, and adjust its settings to their (the customer's) particular usage conditions. In order to successfully finalize the evaluation/trial stage, it's absolutely essential that the supplier iterate with its potential customer.

This is an eminently decisive moment in the new technology adoption process: over the course of the industrial trial period, the customer will be testing and confirming that a new product performs as promised for their particular usage conditions. Suppliers should remember that new technical products inevitably have a reputation for being more costly, riskier, and more problematic than products that are further along in their life cycles. Once again, the success or failure of the trial stage is determined by how well a supplier has studied the new product's target applications and usage conditions.

If a company's market segmentation lacks specificity, or if it's based on very limited field information, then there's a much greater risk of unexpected product failures during the trial stage. Suppliers that aren't sure whether or not a potential customer is a target customer need to figure this out before allowing the customer to test out their product or service. Aside from the time it takes to technically configure the product and get it up and running, suppliers shouldn't think of this as a 'trial and error' stage. 'Trial and error' is reserved for the product development program, with its *alpha* and *beta* tests. In other words, even though a supplier can learn important information from this stage that allows them to perfect their product design, the trial stage in the adoption process is essentially a trial stage for the customer, not the supplier.

Variables That Affect the Success of a New Product Introduction Program

There are numerous variables the affect the success of a new technology's introduction into the market. However, because there's an infinite number of different products and services, and because each manufacturer, intermediary, and end-user faces vastly different circumstances, the importance of any one of these variables changes on a case-by-case basis. As such, the variables discussed in this chapter are treated as open-ended questions, without prioritizing any one variable in particular. An industrial marketing strategist can use these variables as checkpoints. The table in Fig. 12.7 lists possible checkpoints that can be used to determine the potential adoption rate for the new product.

An Adaptable Protocol for Difficult or Risky Introduction Scenarios

In order for this discussion to encompass the wide range of possible innovation strategies (improvement of a current product, product line extensions, a product that is new to the company and the market, or an entirely new product, see Ansoff matrix), this chapter will focus on the introduction protocol for entirely new technical products (meant for new applications). That way, the concepts and the introduction protocol presented in this chapter can be used by a variety of suppliers, even those that find themselves in less risky situations. Less risky situations include: a product that has already been tested and used in other regions is introduced into a new geographic region; product line extensions; or the introduction of product improvements or adaptations for a product currently in use.

Factors that have an influence over the rate of adoption	Yes/no	Why?	How does this influence the adoption rate?	Why does this influence the adoption rate?	Ideas to limit or increase this influence
Access to finance by integrators or end-users					
End-user fragmentation, end-user globalization					
Complexity of the new product distribution system					
Complexity of the new product installation/integration procedures					
Technical complexity of the new product/service					
Cost of changing the current technology to the new product by the customers					
Physical environment where the new product will be used					
Customers' R&D investment level					
Length and complexity of the downstream industrial chain					
Level of investment required to purchase the new product by the customers					
Profitability of the target customer industry					
The level of risk perceived by specifiers					
Educational or expertise level of the people at intermediary companies					
Educational or expertise level of the people at the user companies					
Restrictive regulations in the customer industry					
Number of competitors in the customer industry					
Relative criticality level of the new product for the customer (see Ch.3)					
Relative strategic level of the new product for the customer (see Ch.3)					
Performance of the new technology regarding the customer problem to be solved					
Performance of the new technology as a *solver or positioner* offer for the customer (see Ch.3)					
Pre-existing functional fiascos with similar technologies					
The level of awareness of this new technology by the customers					
Turnover rate of key people in early adopter customer companies					
Size of customer companies					
Size and complexity of purchasing decision making units in customer companies					
The level of consolidation of the current technology (to be replaced by the new product)					

Fig 12.7 This table lists possible checkpoints; these variables can affect the rate at which industrial customers adopt a new technology

Any readers currently involved in their company's product introduction program are welcome to adapt the procedures and concepts discussed in this chapter to fit their specific needs. This chapter will focus on the most risky and challenging introduction scenario for an industrial company: the introduction of a product that is entirely new, both for the company as well as the marketplace.

Insofar as product life cycle, this chapter will discuss the introduction program starting from point 3 on the diagram in Fig. 12.1. This diagram is a generic representation of product life cycle; it shows the stages leading up to a product's introduction into the market. In this diagram, Stage 5 is when a company 'reintroduces' a product into new geographic regions, or new applications. 'Reintroduction' should be managed by the manufacturing company itself, other licensed companies, or other local manufacturers or distributors.

Given the above, and depending on how novel or complex the new product is, a company may have chosen to enlist a select group of customers and suppliers to participate in the development process (please refer to Chap. 6 for more information on customer and supplier participation). In fact, doing so is good practice.

Three Fundamental Stages in a New Product Introduction Program

Before analyzing and discussing the protocol for new technical product introduction, it's a good idea to visualize the three basic stages of an introduction program. These stages are: pre-introduction, D-day, and introduction. This is shown in the product life cycle timeline in Fig. 12.8.

A company should have a database where it documents everything that occurs during each of these stages; that way, the company can analyze this information later on. Just like many other recurrent company activities, new technical product introduction has its own learning curve. The learning process is made that much easier if the industrial marketing strategist can go back and review past records of their company's introduction programs, analyze them, and actively work to improve these programs on an ongoing basis.

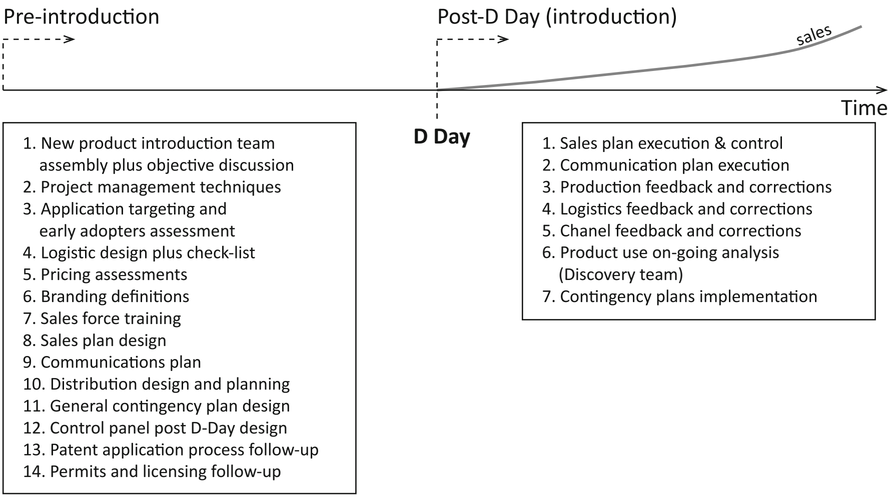

Fig. 12.8 This diagram shows the three fundamental stages in a new technical product introduction program as well as the activities that take place during each stage. These three stages are: pre-introduction, D-day, and introduction. D-day marks the day that a product is ready to be commercialized. Prior to D-day, a multidisciplinary team headed by a company's Industrial Marketing Department will have created a plan for each of the activities shown above. Following D-day, these plans are implemented, monitored, and adjusted

Stage N°1. Pre-Introduction

For the most part, the pre-introduction stage is centered around planning. The activities that take place during this stage can (or should) begin while the product is still in development. In some cases, a company may start formalizing its introduction program as early as the conceptualization stage in product development (see Chap. 6). Other times, a company may prefer to wait until its received the 'green light' from the feasibility analyses, indicating that it can continue to design and develop the product. Whatever the case may be, the NPIT needs to have a detailed understanding of the future product or service's characteristics. To that end, the NPIT should meet and train as much as necessary with the technical professionals involved in the development project.

Generally speaking, the pre-introduction stage consists of the following activities:

Formation of the New Product Introduction Team (NPIT)

The introduction program for a new technical product into the market is one of the most complex programs that a company has to deal with: almost all of a company's departments participate in the introduction program, and they each have their own specialized tasks and activities that need to be synchronized and coordinated. The NPIT is a multidisciplinary team whose structure is just like that of any other executive and effective work team; it has a Project Leader (the leader of the NPIT), several Functional Leaders, and several Task Managers (who are responsible for each project's sub-activities). See Fig. 12.9. For these professionals, the introduction program should be the focus of their day-to-day activities.

As mentioned earlier, the Project Leader should be someone whose opinions and leadership are well-respected within the organization. Since marketing activities are a significant part of the introduction program, this leadership position should be assigned to the General Manager, the Commercial Manager, or the Marketing Manager. Whatever the company decides, assigning someone to this position creates accountability; ideally, however, the General Manager has a responsibility to stakeholders for the success or failure of the introduction program. The Project Leader is in charge of personnel that report to a separate boss for their day-to-day activities; this further complicates the various personalities, egos, and insecurities that frequently wear upon a matrix organization. From this perspective, the best leader for the NPIT is the General Manager. If the General Manager is not available (although the author sees no good reason why they shouldn't be), then, at the very least, whoever is put in charge of the NPIT must be openly empowered and supported by the General Manager.

Naturally, the intensity of NPIT members' workload, as well as their respective roles, depends on the nature of the product and the product's market. The stages described in this new product introduction program (see the Gantt Chart in Fig. 12.16) serve as a series of checkpoints; a company can use these stages to determine which activity it needs to plan and assign a Functional Leader to oversee it. Functional Leaders should be knowledgeable about the activities they oversee and,

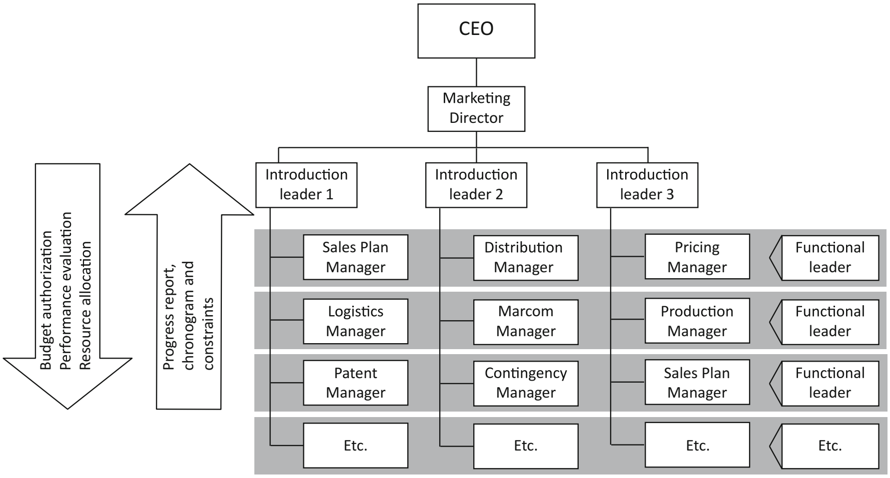

Fig. 12.9 This chart provides a possible organizational structure for a New Product Introduction Team (NPIT). Each component of the pre-introduction stage is assigned to a Functional Leader. Task Managers are responsible for overseeing specific tasks; this allows a company to properly plan its pre-introduction activities

moreover, they should possess adequate leadership skills in order to manage their specialized functional sub-teams. Ideally, NPIT Functional Leaders should work with and report directly to the Project Leader. By working closely with one another, the Project Leader and Functional Leaders help their company avoid the kind of problems that typically plague more bureaucratic organizations, such as poor coordination or misunderstandings.

As mentioned earlier, the leader of the NPIT should work with a matrix organizational structure. This means that logistics personnel are in charge of the logistics analysis, sales personnel are in charge of creating a sales plan and building an *early adopter* customer portfolio, industrial marketing personnel are in charge of the pricing policy and distribution and branding strategy, and the legal department is responsible for following up on the patent and certification process, etc. From a attitudinal standpoint, the NPIT should approach this program with a sense of urgency, pay incredibly close attention to details, and make sure that their work is of the highest quality. The NPIT should never think of these activities—which are essential to a new product introduction program—as 'extra work' that they do in addition to their regular tasks. Upper management should make sure that company executives aren't overburdened by an excessive workload; this requires the intelligence to delegate tasks within each department.

Activity Timetable (Creation of a Gantt Chart/PERT Chart)

The main Gantt/PERT Chart should include all of the major activities that take place throughout the three stages of product introduction: pre-introduction, D-day, and introduction. Additionally, a company might decide to create a separate Gantt/PERT

Chart for each activity in each of these stages; this helps guide the Functional Leaders that are in charge of each activity. Given that this is a multidisciplinary program, many of these activities can be carried out simultaneously.

Provide Technical Training for the NPIT

As the reader will soon realize, NPIT members come from different company departments. Each member may have a different educational background and a different perspective on the company's problems. This kind of diversity is always a good thing.

Nonetheless, there's a certain level of knowledge that all NPIT members need to have: technical knowledge about the new technology. This includes knowledge of the product's functionalities, attributes, performance metrics, ideal target application, core design and possible modular designs, the technology's weaknesses and disadvantages, how it compares to competing or substitute products, etc. Without this kind of intense training, NPIT members won't be able to fully or realistically analyze their work or come up with creative ideas.

The NPIT's Internal Activities: Meetings, Coordination, and Monitoring Activities

As a part of this stage, the NPIT needs to discuss its own administrative activities and how these activities should be scheduled. During this meeting, NPIT members should establish how frequently they're going to meet (this includes review and coordination meetings, informative sessions or decision-making meetings). Moreover, each functional leader should establish who is going to be on their team and they should commit to developing Gantt/PERT Charts for their team's activities. The reason this stage involves such meticulous planning is that NPIT members depend on one another in order to carry out their respective activities.

A lot of the introduction program's activities can be planned parallel to one another, which helps save time during plan implementation. Once the NPIT has established the above information, the team can work on creating a Gantt/PERT Chart for the entire program. This chart will include all of the activities from all three stages: pre-introduction, D-day, and introduction.

Set Goals and Objectives for the New Product Introduction Program

For this activity, the NPIT needs to discuss and establish its goals for the program, including: short and medium-term sales goals (e.g. 6 months to 2, 4, or 6 years) and the sales, volume and financial indicators that will be used to assess progress on those goals. Additionally, the NPIT can assess other indicators, such as the customer's and intermediary's satisfaction with the new technology, penetration of an application or geographic region, etc. Several of these indicators may already have been discussed during the economic feasibility analysis that takes place prior to product development. However, between then and now, a lot of things may have changed. The NPIT should take this goals statement quite seriously since, effectively, it's a commitment they're making to upper management and company directors. Given the sensitive nature and importance of this statement, the NPIT may need to wait until they've advanced with their other planning activities and have sufficient detailed information to carefully and thoughtfully establish these goals.

Analysis and Characterization of the Industrial Chain/Industrial Cartography

This is another activity that a company will already have done during the feasibility analyses prior to product development (e.g. market research). When planning an introduction program, there are good methodological reasons why a company should go back and reassess its understanding of the *upstream* and *downstream* industrial chain. In this case, a company should carefully outline and diagram each stage in the industrial chain. This diagram and the information it contains will help a company carry out other planning activities more efficiently (e.g. develop a branding strategy, pricing policy, communications, logistics, sales and MRO after-sales planning, etc.).

Prior to this stage, a company will already have invested a good amount of effort into designing and researching the specifics of its distribution channel (see the Gantt Chart in Fig. 12.16); now, this information can be input into this new diagram (see the map of 'external players' in Chap. 8). This diagram should include important information such as: a characterization of each intermediary company and what role they play (distributors, integrators, contractors, specifiers, end-users), where these intermediaries are located, how many of them there are, etc. Also, the diagram should indicate where in the industrial chain the new technology's functionality and attributes will have the greatest impact (here, the reader should recall from Chap. 3 that there are different types of product attributes: *intermediation*, *externalities*, *usability*, *performance enhancing*, *self-protection*, and *cost reduction*). Likewise, this diagram should include information about the suppliers that provide ingredient and component products (these are the products that are used to manufacture or create the new technology), and any other institution or entity that might affect the rate of adoption. This diagram eventually serves as a backbone for numerous discussions and decisions that take place during the new product introduction program.

Analysis of Target Applications

As this author and many others have taken great pains to stress, it's incredibly important for a company to identify and characterize a new technology's target applications. Without a detailed understanding of its applications, a company puts the success of the new product at serious risk. In practice, the activities that are most important for a successful introduction program are based around proper market segmentation. Activities such as: product adaptations, distribution design, establishing the product brand, pricing policy, communications, logistics, the sales plan, assessing product performance with regards to regulatory and de facto standards, the after-sales program, to name just a few examples. As discussed earlier in this text, the new technology should be specified for a particular application. The more specialized a product is, the more potential it has to benefit its application customers and, logically, the more likely it is to be successful during market introduction. An introduction program needs to have certain information about each application, including:

- Statement defining who the target application customers are (this, of course, includes *early adopters*)
- Potential sales volume within an application and its potential for growth
- Degree of customer fragmentation (the number of end-users)
- Degree of geographic dispersion (where end-users are located)
- What are they like? Description of each member in the industrial chain from manufacturer to end-user
- How do they make purchasing decisions?/What is their purchasing behavior like?
- Etc.

A Statement That Describes a Product's Functionality, Attributes, and Performance Metrics

Creating a *functionality statement* for a product or service is one of the most conceptually challenging tasks for just about any businessperson or technical professional. The reader should recall from previous chapters that functionality is the *product of a product* and, as such, it should be stated as a *benefit* (in contrast, some people erroneously state what a product *does*).

It takes manufacturers time and intense discussions to come up with a functionality statement. Part of the practical value of a functionality statement is that, during the introduction program, it helps focus people's collective, multidisciplinary energies on what really matters, on the very reason explaining why the product will eventually be bought: its functionality(ies). This helps a company maintain the strategic focus of its introduction program. The design for marketing communications, the sales plan, the pricing policy, future improvements and feedback—all of these things require the NPIT to have properly understood and declared the product/service's functionality.

Sometimes, the new technology doesn't provide a new functionality or improved functionality performance; rather, it provides modifications to the product's attributes. The attributes that affect functionality are *performance enhancing*, *self-protection* and *economy* attributes. Other types of attributes can increase intermediaries' productivity (such as *intermediation* and *cost reduction* attributes) or benefit intermediaries and users along the industrial chain (such as *externality* and *usability* attributes). As a part of this activity, the NPIT should state what these improvements are and compare each attribute's performance metrics to competing or substitute technologies.

Define the Branding Strategy

Under certain market conditions and for certain types of technical products, this activity can be hugely important. Under or overvaluing this activity can have some unfortunate consequences, ones that affect a company's market, competition, and the budget for its introduction program.

For more information on different branding strategies, the reader can refer to Chap. 10 of this book. For now, as a summary of Chap. 10, the 'eight laws of industrial marketing' are shown below:

Law Nº1. In industrial markets, a brand in and of itself won't get a company the market position it wants. First, a company has to comply with its customers' product/service performance requirements.

Law Nº2. The greater the market fragmentation (either amongst intermediaries or end-users), the greater the advantage of using an individualized brand for a new industrial product.

Law Nº3. A reputable industrial company can expand its corporate brand to include new product lines.

Law Nº4. In industrial markets, if a company is introducing a me-too product, they'll need to use its generic product name. If the generic name is trademarked, then a company can use a spin-off name combined with its corporate brand name

Law Nº5. In industrial markets, companies that create a new product category should promote it using an individualized category brand.

Law Nº6. In industrial markets, companies should promote new brands using performance metrics and, if possible, comparative metrics.

Law Nº7. A company should only invest resources in building awareness amongst target application customers.

Law Nº8. Manufacturers should use 'ingredient branding' if their product plays a major role in the finished product's performance.

Define the Product/Service Price

Considering all the time that gets set aside for planning the introduction program, a company should be able to determine its prices using value-based pricing, or VBP (described in Chap. 11). That is, VBP takes time! Assuming that a company has been methodical, its Discovery Team will already have obtained a lot of the information required for VBP during research activities (including, for instance, the price and performance value of competing/substitute products).

Properly determining VBP requires a company to have information about its target application market, that is, about the future users of the new technology. An industrial marketer can use VBP to calculate the *reference price*, which is central to their company's overall pricing policy. In order to determine the reference price (see Fig 12.10), the strategist needs to compare the value of the new technology's benefits to the value of the current technology's benefits. For the NPIT, the reference price has immense practical advantage. It serves as a guide, one that helps the NPIT make timely and case-specific price changes during product/service introduction. Moreover, a company can officially quote the reference price to the market, while simultaneously allowing their NPIT to negotiate well-justified, circumstantial price discounts in one-on-one meetings with customers.

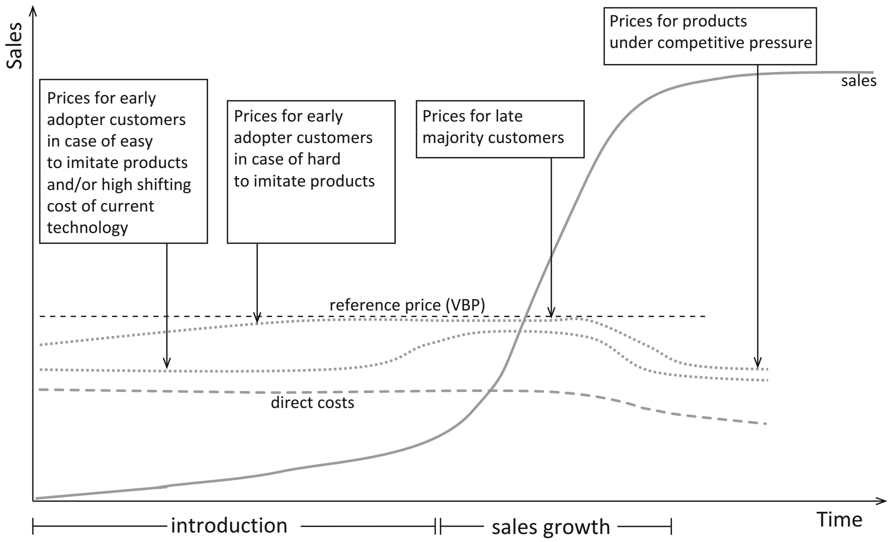

Fig. 12.10 This empirical model depicts the price of a new industrial product/service during its introduction and growth stages. There are two types of cases represented in this graph: on the one hand, a product that is either easy to imitate, or where replacing the current technology would be costly for the customer (see relevant curve), and on the other, a product that is difficult to imitate (see relevant curve). In the case shown above, the reference price stays the same throughout the entire introduction phase. In other cases, the reference price changes depending on the behavior of competitors or substitutes. This graph also shows the empirically-based price behavior of *early adopters* and *early majority* customers

Ideally, a company should always use value-based pricing for its price quotes. This requires having a sophisticated sales force that can educate customers about the metric and comparative benefits of the new product.

Companies need to be careful about providing discounts to *early adopters*. If a target application has very few customers and these customers frequently communicate with one another, then a company runs the risk of never being able to raise its price up to the reference price. One option is to quote the reference price and allow customers to test out the product for free during a limited period of time. Later on, once the customer has experienced the engineering benefits of the new product, they'll be more willing to accept the reference price or discreet discounts.

Remember: the reference price is determined by performance and market variables. At any given moment, a company's direct competitors might decide to lower their prices, which invariably has a negative affect on a company's own reference price. This means that in order to use VBP, a company has to keep constant watch over the prices of competing or substitute offerings. This is more complicated for manufacturers whose new products have to travel through intermediary companies before reaching end-users. Even so, however, it's essential for a company to determine VBP and consequently resist pressure from intermediaries to offer discounted prices (regardless of whether these intermediaries are distributors or contractors).

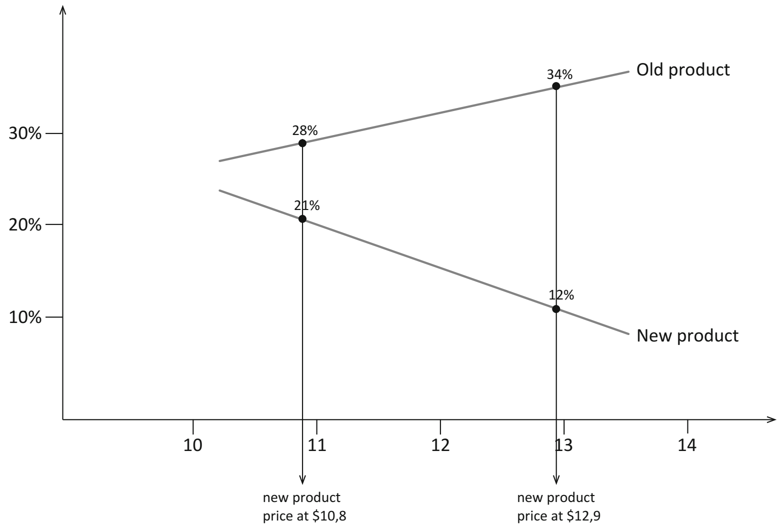

Fig. 12.11 This graph shows the gross profit for a new product that's sold either at $10.80 or $12.90. In the first instance, the new product starts off with a 21 % market share; however, the older product's market share decreases to 28 %. In the second case, where the new product is sold for $12.90, the new product has a 12 % market share, while the older product has a 24 % market share. The sum of these two market shares generates higher gross profits for the company. Adapted from Power Pricing. How Managing Price Transforms the Bottom Line. Robert J. Dolan, Hermann Simon. The Free Press. 1996

Intermediaries that use cost-plus pricing to determine the price of their integrated product or product ingredient tend to demand greater price discounts than intermediaries that use VBP.

Companies need to be especially careful when introducing a new product that's going to cannibalize one of their current products. As Dolan and Simon insightfully explain, there's a delicate price balance that companies need to maintain between an outgoing and incoming product so as not to lose profits during the cannibalization process.[2] When the price of the new product is too low, the old product quickly loses its market share. This significantly lowers the gross profit from both products. Conversely, if the price of the new product is closer to the reference price, then the older product's market share will decrease more slowly. The gross profit from both products will match the company's projections. This is shown in Fig. 12.11.

Notwithstanding the above, an industrial marketer should carefully consider whether it might be more strategically advantageous for the new product to achieve greater initial market penetration. As the reader should recall, some companies'

[2] Power Pricing. How Managing Price Transforms the Bottom Line. Robert J. Dolan, Hermann Simon. The Free Press. 1996.

strategies involve creating new niche markets (or, a new and specific application), which allows them to grow very quickly compared to more established companies.

Design the Distribution Channel and the Terms and Conditions of the Distribution Agreement

During the feasibility analysis at the start of a product development program, a company determines whether it requires third-party distributors or whether it can distribute its own products directly. If a company requires third-party distributors, then this is the stage where the NPIT outlines what kind of distributors they're looking for, where these intermediaries should be located, and the contractual terms and conditions that will make the distribution relationship as harmonious as possible. Once again, the reader is reminded that companies need to properly segment and characterize their target applications—doing so is the only way for companies to develop a distribution strategy. As discussed in Chap. 9, certain types of distributors are better suited for distributing new products (of course, these same intermediaries may be totally inappropriate in other types of situations). In order to determine what their best distribution options are, the NPIT should consider the following variables: the product's technical complexity, how specialized it is for a particular application, and aftersales MRO services requirements.

Out of all the different types of distribution, proactive *exclusive distribution* has the greatest potential for new product introduction. Other types of distribution that are suitable for new product introduction include product specialist distribution, application specialist distribution, technology specialist distribution, or parallel distribution. Unfortunately, the downside to the latter four models is that distributors may not exclusively represent the manufacturer's brand.

Of course, companies aren't always lucky enough to find a good distributor in the geographic zone where the target application is located. In that case, companies may decide to set up (develop) a distributor with the best possible characteristics for distributing the new product. Inevitably, this is a slow process and it delays any aspirations of a speedy product/service introduction. Other manufacturers might decide to contract less than ideal distributors and use their own resources to compensate for any of the distributor's shortcomings. This means that product/service introduction will go more quickly, yet, given the imperfections of the distribution system, it also carries a greater degree of operational risk.

The design for the distribution contract and the manufacturer-distributor relationship was also discussed in Chap. 9. Given the strategic importance of new product introduction, distributors can be given special incentives as motivation and there should be intensive follow-up once the product is introduced. Both activities (hiring a distributor and follow-up on the new product) should be scheduled separately on the introduction program's general Gantt Chart.

Design Marketing Communications

Industrial marketing communications are arguably the most misunderstood phenomena within the field of marketing science. Oftentimes, they're falsely equated with frenzied consumer marketing campaigns, where companies try to insert themselves into customers' minds at all costs. Even today, the majority of industrial company executives still think that there's no such thing as 'bad publicity'. However, in an industrial context, there most certainly is. Indeed, publicity can be bad, unnecessary and costly.

Industrial marketers need to remember that when it comes to introducing and selling technical products, their best tool is technical sales *consultantship*. When the target application has too many customers—enough so that it would be economically impossible to do direct promotion via technical salespeople—then a company should consider using other forms of marketing communications in their marketing program. Yet, no matter what, it's important to realize that the ideal promotional program is defined by consultative, iterative, and technical selling!

The communications program for a new industrial product should be designed based on who the market players are, the defining characteristics of each stage in the industrial chain, and the defining characteristics of the new product or service. Only once a company understands these variables can it make decisions about how to communicate its message (via the sales force, intermediaries, specialized advertising, political lobbying, etc.) and what that message should be like (unidirectional, metric, political, iterative, etc.). There's a wide-range of communications programs for an industrial marketer to consider, everything from pure consultative selling (without any other form of marketing communications) to advertising to fragmented markets. Take, for instance, companies that design, develop and sell highly technical products for very specific applications. These companies may decide to exclusively communicate with the customer's personnel, which will help them avoid unwanted attention from imitative or unscrupulous competitors.[3]

From an architectural standpoint, downstream industrial chains can be classified in three different ways based on customer fragmentation (that is, the number of customers at each stage). This is shown in Fig. 12.12.

Manufacturers that distribute their products directly to customer companies (e.g. fuel pellets for a nuclear power plant) tend to have an industrial chain similar to C. The promotional program for this kind of industrial chain doesn't require that much analysis. It should consist almost exclusively of high profile technical professionals. In the event that the new technology has significant implications for the public sector, then it should also include technical-political lobbying.

Case B shows an industrial chain with a high level of customer fragmentation, both at the intermediary level as well as the end-user level. During an introduction program, companies have to educate their customers about the new product rather quickly—and, in a situation like Case B, this could become prohibitively expensive (Case B tends to occur when there are a high number of contractors or integrators for the new product). In industrial chains similar to Case B, companies may want to use mass media platforms to promote their technical offering (e.g. technical advertisements). The target audience for these messages will depend on whether the new product's features are designed to benefit intermediaries, end-users or both. See Fig. 12.13.

[3] The Hidden Champions of the 21st Century. Herman Simon. pp. 163–9. Springer, 2009.

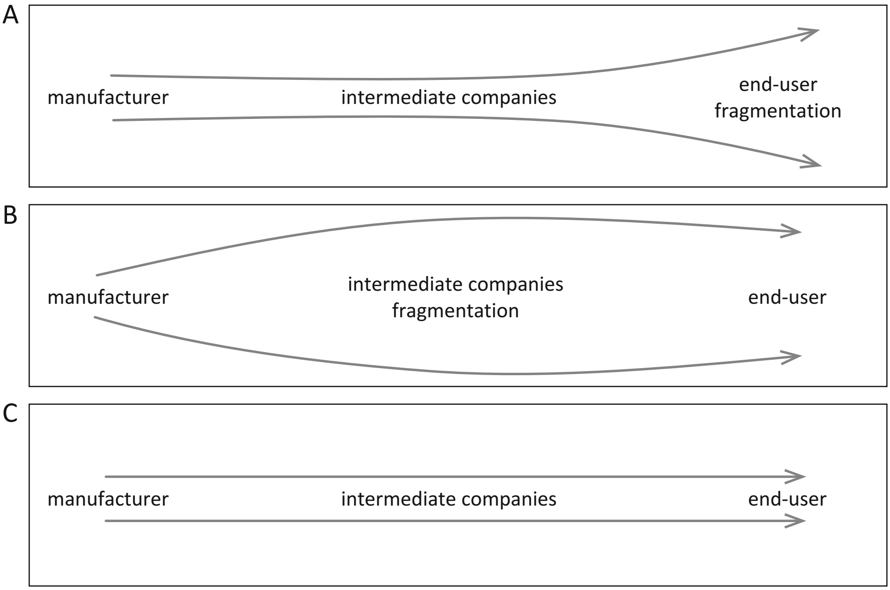

Fig. 12.12 Based on the degree of customer fragmentation at each stage, downstream industrial chains can be classified in three different ways: (**a**). Downstream industrial chain with very fragmented end-users, (**b**). Downstream industrial chain with fragmented intermediaries, and (**c**). Downstream industrial chain with a limited number of customers (be these intermediaries or end-users)

Case A in Fig. 12.12 shows an industrial chain with highly fragmented end-users, but with a reduced number of intermediary companies, meaning that a company can carry out technical promotional activities directly with intermediaries (e.g. via their sales force). How does a company decide if there's enough target customer fragmentation to warrant one type of promotional approach over another? An industrial marketer, who will already have characterized the target application and gauged the new product's sales potential, can use the 80/20 rule: so long as the consultative sales force can efficiently manage 80 % of the potential sales, then the market isn't sufficiently fragmented.

In situations like Case A, companies may want to use mass media platforms to promote their technical offering (e.g. technical advertisements)—this is an excellent idea if the new product's features are designed to benefit end-users. See Fig. 12.13.

Even though the three cases shown in Fig. 12.13 are all based around the same industrial chain structure, they each represent a different set of circumstances. The new technology might affect intermediary companies or end-users in different ways, or the motivation to adopt the new product may differ substantially between intermediate companies and end-users.

Case A represents an industrial chain in which the product only benefits direct customers (e.g. temperature control software for a nuclear power plant); thus, the product's functionality and attributes only benefit that particular customer.

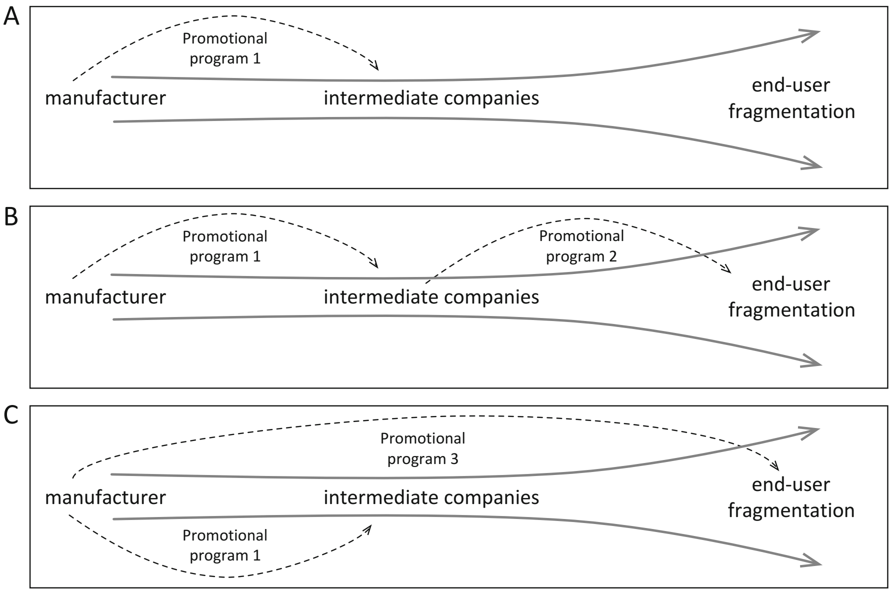

Fig. 12.13 The three different types of promotional programs shown above (**A**, **B**, and **C**) all apply to the same industrial chain structure, one in which there are numerous end-users. Case A represents a standard promotional program; here, a company uses a consultative sales force to promote its offering to intermediaries (integrators/installers). In this case, the manufacturer determined that intermediaries are the ones that benefit from the new product and as such, they'll make the decision about whether or not to adopt it. Case B provides an illustration of a parallel promotional program; here, the manufacturer teaches intermediary companies about the new technology. In turn, intermediaries carry out a mass technical promotional campaign that educates fragmented end-users about the benefits of the new technology. Finally, in Case C, the manufacturer implements a mass promotional program; this program is aimed directly at end-users and is meant to build up their demand for the new technology. This program may or may not receive support from intermediaries

In Case B, the new technology (an ingredient or component product) *significantly* benefits end-users; however, before it can reach end-users, integrators first have to be interested in the new technology. Integrators react favorably to new technologies that improve the competitive position of their own offer (see *positioner* product, Chap. 3). Manufacturers that are aware of the benefits their product provides—both directly to the end-user, and indirectly to the intermediary—may chose to design a parallel promotional program: the manufacturer promotes the new technology to intermediaries and, in turn, intermediaries promote the technology to end-users.

In Case C, the manufacturer's new technology benefits end-users, yet fails to interest intermediary companies. Some of these intermediaries may feel that the new technology only adds to their product costs, or that the indirect benefits it provides aren't compelling enough. In this case, the manufacturer has no choice but to

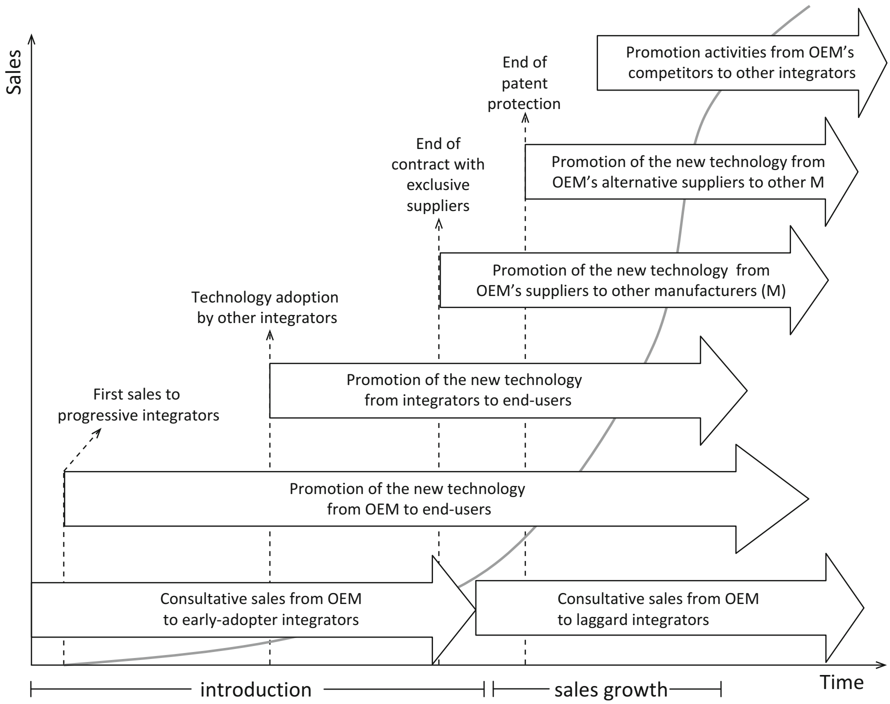

Fig. 12.14 The companies that benefit from offering a new technology will launch their own promotional programs; these programs need to be coordinated and synchronized by whoever is leading the development project. Program coordination is affected by variables such as patent terms and competition from other technological designs

launch a massive customer educational campaign, one specifically directed at the new product's fragmented end-users. At the same time, the manufacturer should provide technical consultation to integrators.

Then again, as discussed earlier in this text, most manufacturers that develop new technologies need their suppliers to develop new technologies as well. Naturally, manufacturers might want to consider coordinating their downstream promotional program with those of their suppliers. This is where things can get easily complicated or disorganized if the various promotional programs aren't well-timed and synchronized. Figure 12.14 provides an example of coordinated and synchronized promotional programs for a new type of electronic component. Given the number of variables to consider, coordinating different companies' promotional programs can get to be complex. Some of these variables are:

– The new product as a new technological category (see Chap. 3)
– Number of suppliers, competing manufacturers, integrators, and potential end-users

- The term dates for a manufacturer's and suppliers' patents
- The expiration date on exclusive supply agreements with select suppliers
- The expiration date on exclusive supply agreements with select customers
- Predictions of when imitative competitors will enter the market
- Frequency of purchases/sales (continuous or on a per-project basis)

Companies can use the tools described above to determine which promotional strategy best suits their product and particular market circumstances. Once they've done this, they'll need to determine what kind of media outlets their potential customers prefer. The best way to do this isn't to have the NPIT speculate about it from the comfort of their office or trust inexpert communications agencies; rather, companies should consult potential customers directly about their preferred methods for obtaining information.

Communication outlets have changed a lot over the years and they will no doubt keep changing. What follows is a list of different forms of communication. The list goes in order from more personal to more massive forms of communication:

- Consultative sales force: as discussed in previous chapters, this is the ideal method for iterating with and educating customers, and providing them with demonstrations of the new technology. However, using a sales force can become prohibitively expensive if there's a high level of customer fragmentation.
- Prestigious industrial trade fairs: this is a good medium for promoting new technologies or new products to potential customers, or for introducing preexisting products into new markets.
- Leading technology experts: many industries have independent opinion leaders that are quite knowledgeable about how different technologies perform and what people's experience has been like using the technology for a particular application. Companies that develop new technologies should consider providing product demonstrations and keeping experts up-to-date about their product's performance. However, companies should abstain from any unprofessional attempts to influence experts' opinions. The most prestigious independent experts won't put up with a supplier's unscrupulous attempts to manipulate them.
- Technical seminars: technical seminars are an opportunity for suppliers to introduce a newly developed technology in an objective and professional environment. Moreover, it's a chance to provide product demonstrations. An opinion leader might be invited to give a talk about the subject; however, both the supplier organizing the event as well as the invited expert need to refrain from trying to sell the technology to the audience. The reader should never forget that industrial customers should be treated as colleagues (customers will be the first ones to realize that a supplier is using manipulative methods to try to persuade them).
- Technical academies. Technical academies are responsible for training young professionals, people who will some day make decisions for or against a particular technical specification. Progressive suppliers should keep these academies up-to-date about new technologies. Some companies think that this activity is too long-term and as a result, they lack the motivation to teach young people about

new technologies that could benefit an industry or a society. Yet, 5 years go by incredibly quickly and since these future professionals will be making decisions about whether to adopt a given technology, they'll need to be educated about the technology either way. By that point, however, companies will have to teach them about the technology directly, which lacks the credibility of academia.
- Online discussion groups: in some cases, communities of target customers come together to discuss newly emerging technologies in online interest groups. For global customers, this can be one of the most trusted methods for gathering information; however, it makes it easy for unscrupulous suppliers to insert biased (or even false) messages about their products' performance or that of their competitor's.
- Technical journals or magazines. This only works if target customers see it as a serious and credible source of information. Otherwise, it's a waste of time and money.
- Mass advertising. This is the most massive and expensive way to promote a new technical product. If an industrial marketer is going to pursue this type of promotion, he/she needs to have carefully studied the characteristics of the market and the new product. Many companies show poor judgment by trying to raise awareness outside of their target application markets.

Finally, the marketing communications team should design a procedure for measuring the impact that the promotional program has on sales, raising customer awareness, or teaching target customers about the offering. This evaluation should be carried out during the introduction program and should be implemented alongside the marketing communications program.

Design the Logistics System and Create Checkpoints for Assessing Any Potential Problems

This is one of the most demanding and work-intensive activities in a new product introduction program. It requires its own highly dedicated subteam that reports directly to the NPIT. Below is a list of key issues that need to be included in the subteam's logistics plan:

- Legal norms or regulations that govern the logistics of the new product or service
- The design and ease of the transportation system that takes the product/service from the supplier's facilities and delivers it to the end-user
- Design or determine proper storage conditions
- Design or determine how the product will be identified by the manufacturer, intermediaries, and end-users
- Design product packaging that's appropriate for each step in the logistics chain (from the manufacturer's facilities to the end-user's).
- Design a guide or design signage that shows how to handle or use the new product or service

– Design a procedure for remote or on-site assembly or integration
– Minimize safety risks to personnel at the manufacturer's, intermediary's, and end-user's facilities
– Minimize environmental risks in product manufacturing, transport, use, and recycling
– Minimize the risk of damaging the manufacturer's or the customer's facilities
– Design a logistics plan for product maintenance or repair
– Design a distribution system for OEM (*original equipment manufacturer*) or aftermarket parts that will be distributed during the product's service life
– Design and determine how to recycle the product at the end of its service life

Once the logistics subteam has developed a comprehensive logistics design, they'll need to go through an exhaustive list of checkpoints. This list should include as much detail as possible about any potential problems and the stages described above. Figure 12.15 provides an example of a list of logistics checkpoints.

In addition to the logistics design and precautions described above, the subteam will need to create a procedure and develop KPIs for each relevant logistics variable in the industrial chain. The logistics design should include training for personnel at each stage in the industrial chain. These personnel will need to learn about installation/integration/distribution procedures, expected performance metrics, and feedback protocols.

Analysis and Conclusions Concerning Product Weaknesses

No product, be it new or improved, should be considered perfect. This mistake has been made in the past to ill effect. There are any number of circumstances that could reveal a product's weaknesses: the product could malfunction due to the physical conditions of an application, there could be poor power quality, issues with software or malware, poor fuel quality, inappropriate interaction with other equipment or substrate, day-to-day user neglect, variations in what the product is used for, etc.

As manufacturers and customers both know, all products and services have their limitations. What's harder to understand, however, is when manufacturers don't anticipate and discuss these limitations openly. Manufacturers that study and are open about the weaknesses of their new technology are acting in good faith, towards their customers and themselves. The manufacturer that designs and develops a new technology should be the first one to find out about the new product's weaknesses. If it doesn't, then its competitors definitely will, as will its customers. Competitors will study the new product, use it, take it apart, and quickly discover its weaknesses. If these competitors are especially unscrupulous, they may even go so far as to launch a fear campaign against the new technology in an attempt to prevent future sales. Arguably, the pharmaceutical industry is a good example of an industry in which manufacturers can easily learn about the weaknesses and limitations of a new product. Pharmaceutical companies are legally required to declare any potential side-effects caused by their medications.

CHECK-LIST OF LIMITATIONS/CONSTRAINTS TO THE MARKET INTRODUCTION OF A NEW TECHNICAL PRODUCT					
1	**NORMS AND REGULATORY REQUIREMENTS** Possible mandatory constraints to the product offer due to conflicts with local norms, standards or laws.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	To chemical components	yes	no		
	To the design	yes	no		
	To the transport	yes	no		
	To the manipulation	yes	no		
	To the storage	yes	no		
	To the usage	yes	no		
	To the recycling	yes	no		
2	**TRANSPORT** Possible mandatory constraints to the product transportation. Consider routes, machinery or equipment needed, personnel needed, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	Ex-works to distributor	yes	no		
	From distributor to installer/integrator	yes	no		
	From installer/integrator to end-user	yes	no		
	Internal transit at the distributor's facilities	yes	no		
	Internal transit at the installer's facilities	yes	no		
	Internal transit at the end-user's facilities	yes	no		
3	**STORAGE** Possible mandatory constraints to the product storage: consider variables such as product expiration, environment of the storage, piling/stacking, product damage, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		

Fig. 12.15 This table provides an example of logistics checkpoints for new technical product introduction

CHECK-LIST OF LIMITATIONS/CONSTRAINTS TO THE MARKET INTRODUCTION OF A NEW TECHNICAL PRODUCT					
4	**IDENTIFICATION** Possible problems/confusions/misplacements and losses from deficient identification or labeling of the product and parts	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		
	For specifier use	yes	no		
	To the tracking system (if applicable)	yes	no		
5	**PACKAGING** Possible hazards to physical integrity of the product due to poor visibility, physical disposition, unwanted interactions, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		
6	**INSTALLATION OR INTEGRATION** Possible constraints to the product installation or integration	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	Installation/integration conditions and timing	yes	no		
	Costs or productivity associated to the installation/integration	yes	no		
	Equipment/machinery/personnel needed	yes	no		
7	**HAZARDS TO THE PERSONNEL** Possible hazards to people or life stock associated with chemicals, noises, odors, gases, temperatures, liquids, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		

Fig. 12.15 (continued)

	CHECK-LIST OF LIMITATIONS/CONSTRAINTS TO THE MARKET INTRODUCTION OF A NEW TECHNICAL PRODUCT				
8	**HAZARDS TO THE ENVIRONMENT** Possible hazards to the environment associated with chemical contamination, noises, odors, gases, temperatures, liquids, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		
9	**HARZARDS TO FACILITIES AND OTHER PHYSICAL ASSETS** Possible problems that the product can cause by direct or indirect action to third-party assets due to fire, flooding, chemical reactions, UV rays, gases, pressure, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	At the distributor's facilities	yes	no		
	At the integrator's facilities	yes	no		
	At the end-user's facilities	yes	no		
10	**USAGE** Possible hazards of the new product related to its use	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	Product operation	yes	no		
	Functionality performance	yes	no		
	Direct costs of usage	yes	no		
	Physical/environmental conditions of use	yes	no		
	Product performance related to upstream operations	yes	no		
	Product performance related to downstream operations	yes	no		
	Alarms of misusage	yes	no		

Fig. 12.15 (continued)

	CHECK-LIST OF LIMITATIONS/CONSTRAINTS TO THE MARKET INTRODUCTION OF A NEW TECHNICAL PRODUCT				
11	**MAINTENANCE** Possible constraints to the product maintenance: accessibility, costs, parts, workforce availability and experience, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
	Easiness of maintenance	yes	no		
	Costs	yes	no		
	Frequency needed	yes	no		
	Tests (local or remote testing of the product)	yes	no		
	Software updates (if needed)	yes	no		
	Maintenance tracking	yes	no		
	Equipment/machinery/personnel needed	yes	no		
12	**RE-SELLING** Possible constraints to the re-selling of the product. Consider feasibility of re-sale, legal norms, easiness to uninstall, transport and re-install. Consider re-selling prices to maintain	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
		yes	no		
13	**RECYCLING** Possible constraints to the re-selling of the product. Consider easyness to uninstall, transport and discard. Consider recycling of components and materials. Consider environmental hazards if the product is not recycled, etc.	**LIMITATIONS/ CONSTRAINTS**		**IDENTIFICATION OF THE LIMITATION/CONSTRAINT**	**PALLIATIVE MEASURES (NAME PROJECT LEADER)**
		yes	no		

Fig. 12.15 (continued)

Detect and Analyze Any Potential Obstacles That Could Complicate Product Introduction

This includes commercial, financial, legal, or systemic obstacles that appear at any point in the industrial chain during new product introduction. Companies will find that it's easier to foresee and understand these problems once they've outlined a large part of their introduction activities. Commercial difficulties are due to conflicts with distributors or integrators, conflicts between distributors or integrators, conflicts with key suppliers, explosive sales growth, low sales, a new product's impact on other product lines, faulty communication, delays that cause a company to miss the optimal introduction 'time window', inadequate cannibalization of previous products, etc. Financial difficulties arise if the introduction program is underfunded, if the company lacks sufficient working capital to extend credit to customers, etc. Legal difficulties are due to accusations of patent infringement, infringement of the company's own patents, a competitor's acquisition of key company personnel with sensitive information, breach of confidentiality by key suppliers or customers, a product that lacks proper technical documentation, conflicts with regional norms during product globalization, etc. Assuming that a company wants to avoid any conflicts of interest or ethical misconduct, those in charge of this activity need to make sure that they have fully outlined any potential risks and developed a contingency plan for each possible scenario.

Contingency Plans for the Potential Reactions of Competing or Substitute Manufacturers

It would be fairly naive of the NPIT not to anticipate that competitors or substitute manufacturers will react intelligently to a newly introduced technology. Predictions of competitors' behavior shouldn't be confined to abstract ideas or creative declarations; rather, companies should identify every possible scenario and then create a contingency plan for each. "What should we do if competitors lower their prices by X amount in response to our new product? If they lower the price of their repair parts? If they build a plant that's closer to customers? If they lower the prices of their maintenance services? If they expand their product/service guarantees free of cost? If they increase credit lines to our customers? If they offer low quality copies of our product/service sooner than we expected? If they introduce a new product that's just as good as ours?", etc. There are any number of possible scenarios, and it all depends on the corporate culture of competitors in any given industry.

A General Contingency Plan for the New Product Introduction Program

The purpose of a contingency plan in a new product introduction program is that it gives a company clear instructions of what to do in case circumstances prevent or derail the established action plan. The general contingency plan encompasses all of the contingency plans for each separate activity (the sales plan, logistics plan, production plan, etc.). This allows an organization to assess how each contingency plan will influence or affect the rest of the company's introduction activities.

A good contingency plan should include the following:

– A list of all possible deviations, unexpected circumstances, problems or obstacles that could affect the implementation of the introduction plan
– A system for detecting deviations
– A description of how the company will react to each scenario (what procedures and tools the company will use)
– Who is in charge of the contingency plan and who will participate in implementing it
– The potential costs of implementing the contingency plan

When a company is deciding which personnel will help implement a contingency plan, it's good to remember that contingency plans are implemented urgently. These personnel need to be realistic about their availability, and their capacity to participate and remain a part of the contingency plan.

Create a Portfolio of Early Adopter and (If Possible) Early Majority Customers

There are some established indicators that industrial marketers can use to determine which customers are likely to be early adopters of a new technology. Notwithstanding, these should be thought of as generic indicators. Manufacturers should take the time to assess whether or not these indicators apply to their situation and, if necessary, complement them with additional information. These indicators include:

– *Early adopters* tend to be the largest companies in their industry
– The more complex a customer's decision-making unit is, the longer it takes for them to adopt a new technology
– Usually, *early adopters* are the companies that would receive the most economic benefits from a new technology
– *Early adopters* tend to invest more resources in research and development projects
– *Early adopters* tend to be managed by younger, better educated people
– Once a new industrial technology has been introduced, it can take between 5 and 10 years for it to reach half of the total number of target customers in a given application

The NPIT needs to remember that both end-users and intermediaries can be *early adopters*. It's the NPIT's responsibility to identify these *early adopters* and characterize them in detail.

Create a Sales Plan

The sales plan provides a design and timetable for strategic, specialized sales force activities. During new product introduction, these are the activities that the sales force carries out amongst target application customers (end-users) and intermediaries.

A sales plan can reallocate sales resources, allowing the sales force to intensify their promotional efforts amongst *early adopters* and, subsequently, *early majority* customers. The plan should establish who is responsible for each activity, the timetables for those activities, where the activities will take place, and with which customers. The sales plan should take into account things such as sales incentives and sales goals. Additionally, the plan should include a design for an IT-based feedback system. Feedback should be added to an intelligent database (see this book's chapter on the sales force) that helps analyze any anomalies detected during consultative selling activities. If any abnormalities are detected during consultative selling, then these will need to be addressed accordingly. The sales plan should also establish a detailed budget for each of these activities so that when the time comes, the company has enough resources to implement them. Some sales plans can be implemented in a few months, while others may take several years.

Provide Training for the Sales Force, Purchasing Department, and Proposal Department

Odds are, a significant number of personnel from the sales force, Purchasing Department and Proposal Department won't have played an active role in developing the new product. For this very reason, the training program should include the following:

- Physical characteristics of the product or service
- Its functionality(ies) and corresponding performance metrics
- Its attributes (*performance enhancing*, *self-protection*, *cost reduction*, *usability*, *intermediation*, and attributes in case of *externalities*) and corresponding performance metrics
- Which suppliers were chosen to participate in the development process and their respective technological contribution
- Description of the pricing policy
- Description of the branding strategy
- The product/service's limitations and weaknesses (and how to discuss these with customers)
- Its target applications
- Distribution logistics and strategy
- The communications program
- The maintenance program
- Repair procedures
- The product/service's service life
- The technology that the new product/service is meant to replace
- Planned cannibalization of the company's own products

The sales force needs to familiarize itself with the sales plan for new product introduction, even if several of its members may have helped draft the plan to begin with.

The training program should be graded and participants should be fully aware of the minimum passing score (Fig. 12.16)

MAIN ACTIVITY CHART FOR THE NEW PRODUCT INTRODUCTION PROJECT																
	ACTIVITIES	TEAM ID	FUNCTIONAL LEADER	TASKS	DELIVERABLE	W1	W2	W3	W4	W5	W6	W7	W8	W9	W 10	W etc.
1	NPIT assembly (HQ)	CEO, R&D, LCO, COO, CMO, SCO	Frederik Fraß	Define team structure, members and leader.	NPIT team structured and communicated to the rest of the organization.											
2	NPIT technical training	R&D, CMO, CCO, SCO, & others	Sabine Jentsch	Define and prepare workshops, plant visits, lab visits, test visits.	Training content test score > 85											
3	NPIT meetings, follow-ups and activities/tasks coordination	NPIT and others	NPIT leader	Define informative, decisional and coordination meetings. Resolve confl icts. Delegate and assign activities as per this Gantt chart.	Complete Gantt chart and sub-charts from functional teams. Functional teams and leaders committed to the project.											
4	Define the New Product Introduction goals.	CEO, R&D, LCO, COO, MCO, SCO, CFO	NPIT leader	Establish metric objectives for sales volume, profit, customer satisfaction, units sales, etc.	The new product market introduction objectives documented and agreed upon.											
5	Industrial chain analysis and characterization	CMO, CCO, SCO,	Giorgio Migliaro	Diagram chain structures, influencers, length, width.	Industrial chain diagram plus details											
6	Application targeting assessment	CMO, CCO, SCO, R&D	Giorgio Migliaro	Size, growth, metrics, customer portfolio per application, competitors and substitute performance metrics.	Application target statement and metric description.											
7	Functionality(ies) statement and attributes identification and measurements	CMO, CCO, SCO, R&D	Giorgio Migliaro	Brainstorm the functionality(ies) statement. Assess the 6 types of product attributes.	Functionality and attributes statement. Product performance measurements.											
8	Branding strategy	CCO, CMO, SCO	Carolina Novaks	Brainstorm branding options. Define product/category/corporate brand choice and name.	Branding strategy defined (product/category/corporate).											
9	Pricing policy	CCO, CMO, SCO, CITO	Marvin Möller	Calculate VBP according to own performance metrics, competitor/substitute performance metrics and prices. Determine reference prices for endusers, distributors, integrators, etc.	Reference price set for integrators, contractors and end-user per application.											
10	Channel design & relationship conditions	CCO, CMO, SCO & others	Sebastian Ruff	Define optimal distribution design, assess gap, reformulate, plan and design conditions & contracts. Design introduction feedback system. Budget execution.	Channel design, conditions, contracts. Channel feedback & control protocol designed.											
11	MARCOM activities	CCO, CMO, SCO & others	Roland Haring	Observe industrial chain. Define media and metric message definitions per applications. Design MARCOM feedback system. Budget.	MARCOM project presented. MARCOM feedback & control protocol designed. Budget approved											

Fig. 12.16 This table provides a general timetable (general Gantt Chart) for a new technical product introduction program

MAIN ACTIVITY CHART FOR THE NEW PRODUCT INTRODUCTION PROJECT																
	ACTIVITIES	TEAM ID	FUNCTIONAL LEADER	TASKS	DELIVERABLE	W1	W2	W3	W4	W5	W6	W7	W8	W9	W 10	W etc.
12	Logistics design & check-list analysis	CLO, COO & others	Jean Pierre Augier	Perform detailed check-lists for all physical steps involved in the product distribution, integration, installation and usage. Design introduction feedback system. Budget.	Logistic designs and protocols from suppliers to end-users. Logistic feedback & control protocol designed.											
13	Analysis and conclusions of the product weaknesses	R&D, CMO, CCO, SCO, & others	Giorgio Migliaro	Identify all potential product weaknesses along the industrial chain. Define constraints and limitations.	List and description of all the product weaknesses. Crisis control proposed.											
14	Assessment of possible obstacles to the post-introduction phase	CCO, CMO, SCO, COO, CLO & others	Corinna Betels	Identify commercial, legal and systemic constraints along industrial chain after D Day. Determine critical set-points. List and define neutralization proposals.	Check-list ready. List, magnitude and solution of potential obstacles.											
15	Contingency plans for possible competition/ substitutes scenarios	CCO, CMO, SCO, COO, CLO & others	Moritz Wegner	Brainstorm. List. Determine critical set-points. Prepare contingency plan. Budget possible execution.	Contingency plan and budget approved.											
16	General contingency plans design	CCO, CMO, SCO, COO, CLO, CITO & others	Moritz Wegner	Gather all contingency issues from other departments, critical set-points and their neutralization plans. Propose execution budget.	Contingency plan and budget approved.											
17	Sales plan design	CCO, CMO, SCO, CITO & others	Felix Thiede	Characterize purchasing customer process for this product. Set goals, structure, systems and process. Design introduction feedback system. Propose budget.	Early adopter customer portfolio ready. Purchasing process and expected timings. Sales plan designed with organization structure, processes, systems, incentives. Lead-tracking system designed. Sales plan feedback & control protocol designed.											
18	After sales plan design	CCO, CMO, SCO, CITO & others	Felix Thiede	Define after-sales activities, including: aftersales process and reports, product usage feedback, parts & accessories availability. Design aftersales feedback system. Budget.	Aftersales process designed. Product usage follow-up systems. Parts and services distribution per target application. Aftersales feedback & control protocol designed.											
19	Early adopters portfolio construction	SCO & others	Annika Rathjen	Investigate, build and profile each customer in the early adopter portfolio.	List portfolio with customer profile.											
20	Sales force, marketing, purchasing and proposal department training	CCO, SCO, R&D, CMO & others	Tanja Rieve	Define and prepare workshops, plant visits, lab visits, test visits.	Training content test score > 85											
21	Intermediate channel negotiations	CEO, CCO, CMO, SCO & others	Sebastian Ruff	Contact, meet and discuss commercial and technical conditions for distribution, integration and installation.	Signed contracts from target intermediates.											

Fig. 12.16 (continued)

MAIN ACTIVITY CHART FOR THE NEW PRODUCT INTRODUCTION PROJECT																
	ACTIVITIES	TEAM ID	FUNCTIONAL LEADER	TASKS	DELIVERABLE	W1	W2	W3	W4	W5	W6	W7	W8	W9	W 10	W etc.
22	Intermediate channel training	SCO, CMO, & others (technical)	Tanja Rieve	Define and prepare workshops & plant visits. Prepare in-house workshops for integrator customers.	Training content test score > 85 + customer certification.											
23	Norms, permits and certificate follow-ups	R&D, Legal staff & others	Sabine Jentsch	Identify steps, chart and set deadlines goals. Design follow-up plan.	Certificates and permits approved and ready to use.											
24	Patent process follow-ups	R&D, Legal staff & others	Sabine Jentsch	Identify steps, calendarize and set deadlines goals. Design follow-up plan.	Patent process follow-up plan.											
25	Post introduction control panel design	CCO, CMO, SCO, COO, CLO, CITO & others	Frederik Fraß	Gather all post-introduction plans from other departments. Define and commit KPIs goals, performance, deadlines, etc.	KPIs defined and committed for al activities.											
26	Volume production planning	CCO, SCO, COO, CLO, CHRO, CITO, R&D & others	Gaspar Garcia	Plan product production in increasing volumes. Assess materials, equipment, supplies and work-force needed. Train workforce. Design production feedback system. Budget.	Equipment, machinery specifications for production line. Production KPIs (unit costs, quality, etc.). Workforce trained. Production feedback & control protocol designed.											
27	Supplier relationship conditions and negotiations	CEO, CFO, CPO, COO, CLO & others	Gaspar Garcia	Contact, meet and discuss commercial legal and technical conditions for critical OEM and non critical suppliers. Design supplier feedback system.	Relationship conditions designed. Signed contracts from critical OEM and non critical suppliers. Relationship feedback & control protocol designed.											
28	Information technology support, implementation and setting up	CITO, CCO, CMO, CSO, COO, CLO, CHRO	Lucas Paffrath	Define IT support at all suitable levels of the product introduction plan. Plan for IT breakdowns. Budget.	IT formal project to support all relevant stages of the pre and post introduction.											
29	Pre and post-in-troduction budget consolidation Finance analysis.	CEO, CFO, CCO, CMO, CSO, COO, CLO, CITO and others	Martin Möltke	Gather all department budgets and consolidate. Team discussion. Compare with pre-assigned budget. Coordinate. Modify previous cash flow estimates and the need for working capital along the introduction and growth phases.	Consolidated pre and post-introduction budget approved by senior management.											
30	D DAY	CEO, R&D, LCO, COO, MCO, SCO	Frederik Fraß	Prepare scenarios. Simulation drills for all systems possible. Identify and list possible constraints. Assign corrective action responsibilities.	D Day plan designed including results from simulations.											
31	Production feedback and corrections	All teams	Gaspar Garcia	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											

Fig. 12.16 (continued)

MAIN ACTIVITY CHART FOR THE NEW PRODUCT INTRODUCTION PROJECT																
	ACTIVITIES	TEAM ID	FUNCTIONAL LEADER	TASKS	DELIVERABLE	W1	W2	W3	W4	W5	W6	W7	W8	W9	W 10	W etc.
32	Sales plan execution & control	All teams	Felix Thiede	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
33	MARCOM plan execution	All teams	Roland Haring	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
34	Channel feedback and corrections	All teams	Sebastian Ruff	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
35	Logistic feedback and corrections	All teams	Jean Pierre Augier	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
36	Supplier feedback and corrections	All teams	Jean Pierre Augier	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
37	Product usage stage assessment & feedback	All teams	Giorgio Migliaro	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
38	Budget control and corrections	All teams	Martin Möltke	Perform feedback system. Execute correction plan if necessary.	KPIs in target by X% (to be set per each case). Deviations informed to all NPIT members, corrective plan approved and implemented.											
39	Contingency plan implementation	All teams	Moritz Wegner	Perform feedback system. Execute correction plan if necessary.	Contingency plan(s) executed and briefed to NPIT team.											

CEO = Chief Executive Officer
CMO = Chief Marketing Officer
CFO = Chief Financial Officer
CM = Commercial Manager
COO = Chief Operations Officer
CLO = Chief Logistics Officer
SCO = Sales Chief Officer
CHRO = Chief Human Resources Officer
CITO = Chief Information Technology Officer
R&D = Chief R&D Officer

Fig. 12.16 (continued)

Create a Plan for After-Sales Services

Because customers are especially sensitive to the risks posed by a new technology, the NPIT needs to meticulously plan and implement an after-sales policy prior to receiving its first purchase order. As discussed in this book's chapter on industrial sales forces, the after-sales policy consists of two concurrent programs: ongoing monitoring to ensure that the product/service fulfills its performance promise (PAS), and the commercial after-sales policy, which includes the sale of repair parts and services to end-users. Both of these programs require careful planning and budgeting.

This plan should establish who is responsible for each activity, what equipment they'll need, the timetable for these activities, and the information system that will be used to input feedback into the company's intelligent database. The work team assigned to this activity will need to coordinate with the teams in charge of logistics, the sales plan, intermediaries, and the pricing policy.

Negotiate with Intermediaries

This is the stage when manufacturers negotiate the commercial, financial, geographic, and logistics terms and conditions with intermediaries. Naturally, these are intermediaries that the manufacturer deemed most suitable for introducing their new industrial product (see Chap. 9).

Although manufacturers may be anxious to reach an agreement and expedite their path to end-users, they shouldn't overlook important details in the terms and conditions negotiated with intermediaries. If the manufacturer is highly dependent on distributors, integrators, or contractors for the success of the introduction program, then the terms and conditions should be outlined in detail, and fully understood and agreed-to by all. The work team assigned to this activity will need to coordinate with the teams responsible for the pricing policy, sales plan and channel design.

Provide Training for Intermediaries

As discussed previously, poor sales performance for a great new product is frequently the result of a poorly trained sales force, poorly trained intermediaries, or a combination of the two.

When planning this activity, companies need to consider what their training objectives are, who will receive training, what information they'll receive, how they'll be evaluated, and how frequently they'll receive further training. At the very least, the training program should be informative enough that companies can achieve their training goals; yet, companies should also avoid sharing too much material or data that could otherwise reach imitative or unscrupulous competitors. Eventually, imitative competitors will almost certainly learn about the details of the new product and how to manufacture it; however, the longer it takes them to do this, the better.

Monitor and Follow-Up on the Product Certification Process

As discussed in the chapter on new product development, this activity (in which a company obtains the necessary certificates of compliance with regulatory or commercial standards) needs to be planned and initiated as soon as possible. The work team or personnel in charge of the certification process need to coordinate with the NPIT.

The certification team should set goals for itself. These goals will help the team avoid delays or miscommunications during the bureaucratic process of obtaining product certificates from regulatory agencies (be these national or international). As those responsible for this activity should know, product certification must never be allowed to become a significant bottleneck in the new product introduction process.

Monitor and Follow-Up on the Patent Process and Intellectual Property Applications

Compared to the case described above, the patent process involves very different procedures, objectives, and entities. Yet, these two these work teams are by and large motivated by the same set of principles. In this case, however, work teams are faced with the added difficulty that it can take a long time to obtain legal protection against imitators—so much so, that many companies prefer to avoid the patent process altogether.

Unfortunately, companies expose themselves to a high level of risk when they introduce a revolutionary new product without the necessary legal protection. This author agrees with companies that have learned the hard way: "no patent, no product." Then again, companies that choose to introduce improved or altered versions of a short-lived product design may decide to abstain from the patent process.

Design a Control Panel for Introduction Activities

Within the NPIT, each functional leader and their respective subteam will need to develop a control and feedback panel for monitoring their team's introduction activities. From there, the entire NPIT should work together to create an integrated control and feedback panel.

The reason it's important to monitor these activities as a wider team is that as soon as the introduction program begins, various activities need to be coordinated and synchronized. This is especially true if something unexpected comes up, and functional leaders find that they have to coordinate corrective actions and contingency plans between different activities. Without this collective control panel, a company risks improving one issue while neglecting or affecting another. For instance, if the subteam responsible for distribution makes decisions on its own, this could have significant implications for the subteams in charge of IT, pricing, the sales plan, the after-sales plan, logistics, etc.

When the introduction program is first implemented (post D-Day), the NPIT may need to hold as many as several meetings per week just to assess indicators and feedback. Later on, once the introduction program has stabilized (if, that is, it does stabilize), the NPIT may decide to meet as infrequently as once a month.

Sometimes, unexpected problems require the NPIT to make decisions more frequently. The feedback mechanism shown in Fig. 12.17 consists of four stages: (1) Feedback from introduction activities is input into the control panel, (2) The entire NPIT analyzes this feedback, (3) A contingency plan is chosen and activated, (4) Implementation of the contingency plan.

Planning for Volume Production

The plan for volume production is closely tied to the manufacturer's previous experience producing its best product prototype (this is the prototype that was successfully used for in-house and on-site testing). This activity is essentially about improving the production process; only this time, it's volume production. During this process, a company has to do regular quality control checks, assembly supervision, protocol improvements and carefully monitor costs.

This plan should be based around the expected growth rate (this is obtained through sales forecasts). In addition to production and logistics personnel, it's a good idea for the planning process to include personnel from other departments, such as research and development, IT, and finance. The reason why it's good to have multidisciplinary planning is that this discussion needs to consider things such as the product's functionality and attribute performance, the integrity of the product's design (R + D), how it will be funded (financed), and support from IT.

During this stage, the operations department should determine the requirements for volume production, design a methodology for volume production, and train process operators (for more information, see Chap. 6, the section on planning and scaling-up production). Additionally, this team should design a quality control protocol and identify key indicators that can be used to gather quality feedback and control costs during product introduction.

Design and Negotiate Contractual Terms with Suppliers

Any great new product relies on support from key suppliers that design and offer outstanding technologies of their own. During this activity, a functional subteam works with suppliers to design and negotiate a confidentiality agreement and supply contract. Naturally, these contracts should benefit both parties. The functional subteam should also design contractual terms and conditions for less critical suppliers. It's important to remember that eventually, both critical and non-critical suppliers will want to sell the new technology to other manufacturers. This is completely reasonable and should be planned for during this stage. See Fig. 12.14. This activity also involves creating quality control protocols for the supply chain and contingency plans in the event that some problem arises in production, logistics, or due to some inter-organizational conflict.

Design IT Support Systems

Unfortunately, modern-day developments in IT tend to disproportionately favor finance and accounting departments. Other company departments frequently have to wait until the very end of an ERP development project to receive their own database and software.

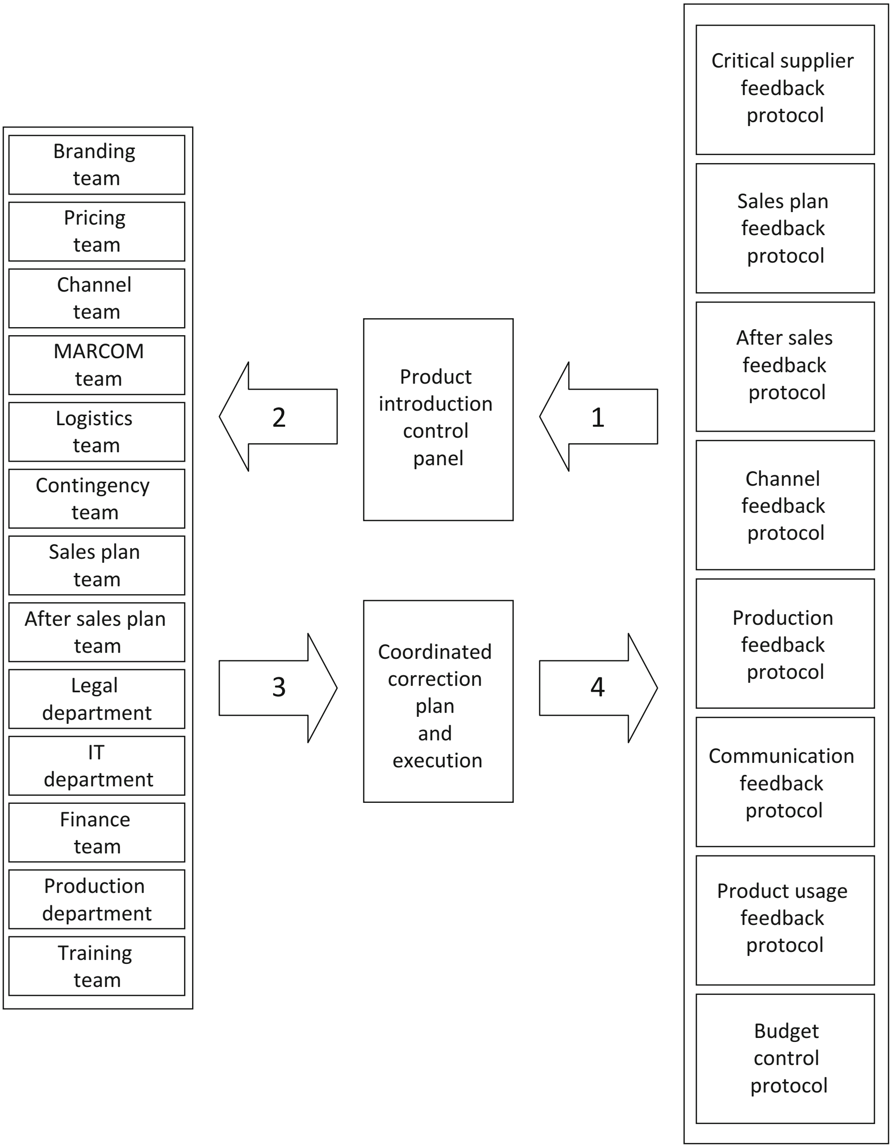

Fig. 12.17 A proposed feedback model that allows companies to receive and respond to feedback during new industrial product introduction. This model consists of four stages. Stage 1 is initiated by work teams (these teams will have previously been assigned to this task). During Stage 2, the entire NPIT analyzes the feedback it has received. Stage 3 is when a company activates a contingency plan (or corrective action), and Stage 4 is the implementation of that plan

As a result, these departments and line activities frequently receive a lower level of ERP design and implementation (if any at all). Too many companies are forced to carry out a second development project just to design and employ their own specialized marketing and sales software.

Whatever the case may be, a company's information technology (IT) department needs to play an active role in planning the new product introduction program. An IT department's contributions at various stages of a project can be a decisive element in ensuring that project's early success. IT systems can be used for things such as: managing a general project timetable, managing activity timetables, managing a dynamic pricing policy based around changing field information, managing performance indicators for distributors and integrators, processing logistics data, processing information from the sales plan, tracking and processing production variables, and keeping track of the budget and costs of the various stages of the introduction program.

Significantly, the control panel for detecting and measuring anomalies during product introduction (see Fig. 12.17) needs to be intelligently designed and supported by IT. This system should process information quickly and intelligently, and present its findings in way that makes it easy for a well-coordinated NPIT to analyze them and develop corrective action plans.

Lastly, intelligent information processing allows a company to learn from experience each time it introduces a new product into the market. This IT system should store information about each case, each new product, and the corrective actions employed over time. Later, this information will help company members keep from repeating past mistakes, improve upon their past actions, and avoid wasting time.

Consolidate the Pre-Introduction and Introduction Budgets

As the reader already knows, the budget for new product introduction is created at the very beginning of the development program. This budget, which is initially used to assess the economic feasibility of the development and introduction programs, should guide a company on how to allocate resources during introduction.

Each of the functional subteams has to add their own detailed budget to the consolidated introduction budget. As such, the consolidated budget includes a timeline of various company expenditures. Companies can use the demand forecast (previously discussed in this text) to estimate future expenditure behavior. See Fig. 12.18.

Companies that don't create a detailed introduction budget will find that as time goes buy, the amounts they originally budgeted for will change. Ultimately, the budget will end up being considerably larger than what they originally projected. Companies should carefully document and process any discrepancies between their original budget and their actual expenses during product introduction. That way, a company can analyze this information and learn from it.

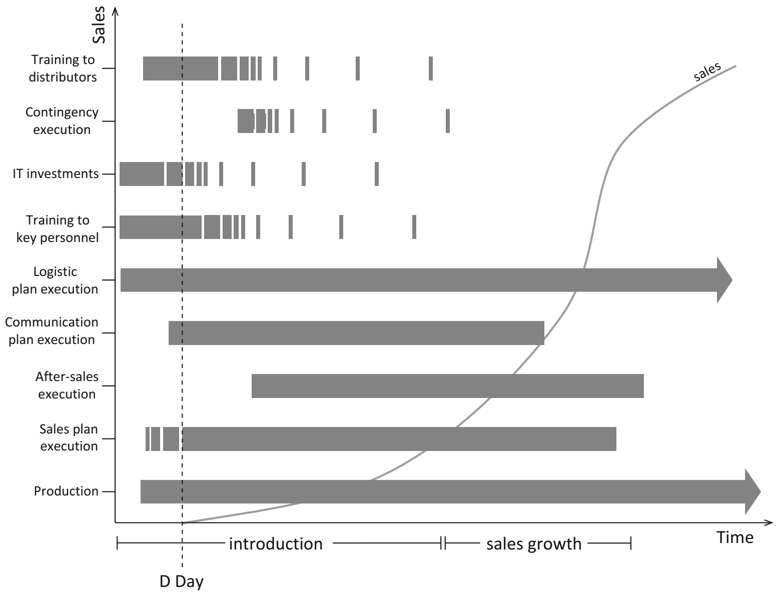

Fig. 12.18 Example of a consolidated activity budget for new industrial product introduction. The Y-axis lists the various introduction activities and the X-axis shows how long each of these activities lasts. The time it takes to complete an activity depends on the demand forecast (which will previously have been established). This is true both for products that sell regularly as well as products sold on a per project basis. Companies can adapt this tool to determine the costs incurred by each activity

Stage N°2. D-day

D-day marks the day that a product becomes operationally available, allowing it to be ordered and shipped to customers. As mentioned several times before, industrial companies should use D-day as a target date, one that is useful for managerial planning and execution. D-day isn't necessarily the day that companies will start beating the drum about their new product. On the contrary, many progressive manufacturers are discreet about the 'real' start of product introduction, preferring instead to work *tête-à-tête* with *early adopters*. In cases where intermediaries or end-users are highly fragmented and therefore require more massive promotional activities, D-day marks the start of the promotional program. Yet, for a lot of manufacturers, it's preferable to take the time to perform a trial run. That way, they can resolve the kinds of issues that naturally come up during an introduction program before making a public announcement about their product/service's availability.

D-day is its own program, with its own leader and subteam. Preparation for D-day involves an enormous amount of responsibility. Ideally, the functional subteam should create an extensive checklist of potential problems and perform a 'simulated D-day' in which they carry out operational tests. Additionally, the subteam is responsible for determining the optimal time window for product introduction: they should identify a time frame in which cyclical market characteristics or target customers' business activities match the ideal time for product introduction.

For a lot of companies, D-day is also a milestone that marks the end of the product/service development project (see Chap. 6). Oftentimes, the date for D-day is one of the first goals that a company establishes in its product plan (this is the plan that outlines the timeline for development and market introduction). Once a company has chosen a precise date for D-day (1 or 2 years in advance, for instance), it should take this date seriously and commit to meeting it. If a company is constantly rescheduling the date for D-day due to delays in other pre D-day activities, it lessens the credibility of a product's market introduction project.

It's up to a company's Industrial Marketing Department, along with senior management, to assign a challenging, yet realistic, date for D-day.

Stage N°3. Introduction

Evaluate and Correct the Manufacturing Process

As soon as a company receives its first purchase orders, it begins volume production and/or supplies products that were previously manufactured and kept in stock. The team responsible for assessing manufacturing processes should inspect and measure each item on the previously established control panel; that way, they can quickly input feedback into the control panel and execute contingency plans. This activity should last for the entirety of the introduction stage, after which time the operations manager is given full control. The manager will continue to implement standard protocols for manufacturing control and evaluation.

Implement the Sales Plan and Measure Its Effectiveness

The sales plan needs to begin well in advance of D-day so that a company will be prepared to process the first purchase orders it receives at that time. In make-to-order manufacturing, the sales plan can be initiated long before D-day arrives. The team responsible for evaluating sales plan activities should inspect every item on the checklist and have the sales force perform on-site measurements of each one. That way, the team can quickly input feedback into the control panel and execute contingency plans. Remember: the sales plan is headed by sales managers, yet evaluation of the sales plan is its own parallel activity. These activities need to be closely coordinated with one another. Information should be carefully and diligently added to the control panel using an intelligent IT system.

Implement the Pricing Policy and Evaluate Its Effectiveness

A company's formal protocol for quoting prices should be based around its previously established pricing policy (see above). This policy should take into account the following:

– A company should adopt a different pricing tactic for the early, middle, and late stages of the new product introduction program
– A well-defined portfolio of *early adopters*, *late adopters*, and *early majority* customers

– Analyses of the purchasing behavior of target customers in different contexts (national, international, etc.)
– Dynamic value-based pricing information

The team responsible for evaluating the pricing policy should inspect and measure (or request measurements for) each item on the checklist; that way, the team can quickly and systematically input information into the control panel, discuss important issues with other introduction teams, and, if necessary, execute contingency plans. The pricing policy plan is overseen by commercial managers; however, evaluation of the pricing policy plan is its own parallel activity. These two activities need to be closely coordinated with one another. Once again, companies should input information into the control panel using an intelligent IT system.

Execute the Marketing Communications Plan and Measure Its Effectiveness

In this case, there are two types of evaluation metrics:

– Achievement of *tasks* laid out in the marketing communications plan
– Assessment of the *effectiveness* of marketing communications

Non-iterative communications (e.g. radio advertisements, specialized journals or magazines, etc.) are easy and fun to implement, yet measuring their impact can be hard and, in many cases, impossible. Indirect methods of measurement do exist (e.g. research into customers' exposure to the message, awareness of the message, and comprehension of the message),[4] yet, there could be numerous factors that influence a customer's awareness of a new technology, product or brand. This makes it quite difficult to objectively measure how effective promotional communications are. However, in some simpler cases it is possible to measure promotional impact:

– Promotional communications emitted through a single medium, with no sales force participation or influence from other entities, in a new market or geographic region.
– Promotional communications emitted through one or more mediums, with no sales force participation or influence from other entities, in a new market or geographic region.
– Promotional communications emitted through one or more mediums, with no sales force participation or influence from other entities, directed at a new market application.

As the reader will note, there are very few cases in which it's possible to objectively measure the effectiveness of a communicational campaign. However, this doesn't mean that a company should avoid using hard-to-measure promotional

[4] Marketing Metrics: 50+ metrics every executive should master. Paul W. Farris., Neil T. Bendle., Phillip E. Pfeifer., David J. Reibstein. Wharton School Publishing. 2006.

communications. This type of communications can be used alongside other forms of promotion (sales force, seminars, agents, the distributor's promotional program, etc). When dealing with this kind of uncertainty, it's good practice to design a communications plan with metric goals (see above).

Once they've established measurement parameters and a timeline for their activities, the team in charge of evaluating promotional communications should inspect and measure each item on the previously established checklist; that way, the team can promptly input feedback into the control panel and execute a well-coordinated contingency plan. Ideally, promotional communications should be headed by the team that originally designed the communications plan; however, feedback on the plan is its own parallel activity (and should remain so). This information should be added to the control panel using an intelligent IT system.

Evaluate and Correct the Performance of Intermediaries

Depending on the complexity of the downstream industrial chain, this activity can be fairly complicated and demanding, with a long list of checkpoints. When planning this activity, a company needs to consider all of the distributors, integrators and/or contractors that play a role in installing the new product.

Companies need to be especially careful and meticulous when evaluating integrators, contractors, and assembly companies. There are numerous examples of ingeniously designed products that have lost credibility after experiencing problems in installation or integration. If product installation or integration involves technical or other types of risks, suppliers shouldn't try to skimp on costs by not supervising the initial integration or assembly operations.

As a result, a product's initial sales (which include supervision of the integration process by the OEM manufacturer) provide valuable information about real installation/integration conditions. Information from the evaluation should be carefully and diligently added to the IT-based control panel; that way, the contingency team can assess this information and execute any necessary contingency plans.

Evaluate and Correct Logistics Performance

Similar to a company's evaluation of intermediaries, this activity is marked by systemic complexity. Whomever supplies the information used to assess and control logistics performance needs to be highly disciplined. The team responsible for evaluating logistics performance should inspect or request measurements for each item in the previously established checklist and promptly input this feedback into the control panel; this allows them to execute contingency plans in coordination with other activities. Ideally, logistics evaluation is headed by the team that originally designed the logistics evaluation plan; meanwhile, implementation of the logistics system is its own parallel activity (and should remain so). In order to make logistics evaluation easier, companies can use statistical tools, IT, processing/analysis, and an alarm system that notifies the company of any deviations from the original logistics plan.

Evaluate and Correct Suppliers' Performance

During the planning stage (and long before D-day), companies should determine what criteria and parameters they're going to use to assess suppliers' overall performance. The suppliers that participate in this process (that is, critical or strategic suppliers) should have a detailed understanding of what this assessment consists of.

Since there are currently very few supplier evaluation models, the subteam responsible for this activity can look to the *Just-In-Time* (JIT) system for inspiration. As of the 1970s, this system has been employed by numerous companies in Japan and other countries. Essentially, the JIT methodology (which is also widely considered a manufacturing, supply chain or business philosophy) allows a customer to expand its operations towards some key suppliers and vice-versa. At the same time, this implies a greater degree of control over production, quality, scheduling, procedures, standards, and productivity. All of these should be measured metrically.

No doubt, JIT is an 'extreme' version of the operational and logistics relationship between two different companies. However, JIT management practices serve as an example, both for designing a supplier evaluation plan as well as for designing the corrective actions in a contingency plan. Once again, in order to make this evaluation easier, companies can use statistical tools, and an ad hoc IT system to detect deviations from optimal supplier performance.

Visits to the Site Where a Product Is Used. Evaluation and Correction of Product Use

This book has singularly emphasized the strategic importance of product use. As stated before, *a product is bought in order to be used and benefited from*.

With this in mind, evaluating customers' user experience and correcting any flaws is of utmost importance. This means that during pre-introduction planning, a supplier needs to design and confirm future visits to the customer's facilities (ideally, these visits should use a methodology such as the Discovery Team), determine which metrics will be used to assess the product/service's functionality and attribute performance, and create an evaluation budget.

The evaluation does much more than simply aid product introduction; it is the first time that a company documents product design and/or production improvements that are based on its real usage.

As is widely known, the first version of a product frequently contains unexpected defects. Progressive suppliers should consider it part of their *hygienic base* to start tackling and mitigating these problems immediately. It's worth remembering that any product defect can set off a fear campaign headed by direct competitors or substitutes. Additionally, target customers could lose faith in the new product, cancel existing purchase orders, and become incredibly conservative about adopting the new product in the future.

By now, the company will already have outlined the product's functionality(ies) and attributes. These provide an excellent foundation for creating a performance and evaluation metric. For this evaluation, a company should use IT systems to process information and develop a statistical database of problems relating to product use; any problems of this nature need to be treated with the utmost urgency.

Monitor and Adjust the Budget

When it comes to new product introduction, there's one thing a company needs to avoid at all costs: that, due to a lack of feedback and bookkeeping, it lacks the financial resources to implement the introduction program as planned.

There needs to be a clear and speedy administrative mechanism for evaluating, monitoring and adjusting the budget. Some authors have shown that during implementation a company's original product introduction budget can double, and even then a company may lack sufficient funds for the program.[5]

This is especially true when companies are introducing a product for the first time or when they haven't gone through the introduction process in quite a while. The repercussions can be disastrous, especially because a 25–30 % cutback in the general budget affects activities that are key to a successful introduction program. Company executives should use their accumulated experiential knowledge to discuss how budget cuts will affect sales force training, the sales plan, training for distributors, IT development, logistics, or production costs.

When companies properly evaluate and monitor their budget in the period following D-day, they ensure that they have enough resources to implement each activity, regardless of whether one of these activities ends up being more costly. Additionally, companies should carefully record their experience monitoring and evaluating their budget, and any resulting decisions—that way, the company can use its accumulated experience in future new product introduction programs.

Execute Contingency Plans

Finally, as shown in Fig. 12.17, the NPIT should always remember how important it is to receive feedback, analyze anomalies, and correct them using multidisciplinary strategies with input from all of the sub-teams in the introduction program. As discussed above, correcting a problem in one activity could seriously affect several other parallel activities. As such, when using the feedback control panel and analyzing its findings, a company needs to consider the ways in which possible changes to one activity may affect other introduction tasks.

This chapter marks the end of the first edition of this book.

It has taken years of work, analysis, and modeling, and is meant to serve as a contribution to the literature on industrial marketing and complement other excellent and established works.

Above all, this book was inspired by the principles of transparency and progress, both of which are inherent in effective industrial marketing.

I would like to thank my readers for the patience and dedication with which they have read and studied this book.

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Claudio A. Saavedra

[5] Profitable Top-Line Growth for Industrial Companies. James D. Hlavacek. The American Book Company. 2002.