
ON LINE CITIZENSHIP

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Emerging Technologies for European Cities

Edited by

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Preface

The international conference On Line Citizenship, held in Venice, Italy on May 30th and 31st 2003, was organized by Sun and the Municipality of Venice, in co-operation with TeleCities and Venice International University. During these days of presentations and discussion among representatives of the European Union, of the National ministries, of TeleCities and of a number of local administrations, an innovative point of view emerged for the development of e-government systems and technologies. E-government has become a relevant subject, not only for administrations at the central and at the local level, but also for ICT companies, which are increasingly committed to a path of innovation and experimentation in the field, both at the European and at the global level. Thanks to this strong commitment and support, the partners held an international conference in order to stimulate the debate on the new forms of electronic citizenship and on the opportunities offered by information technology to local governments and institutions in the re-definition and the re-design of services to citizens and businesses.

This book intends to provide the reader with a synthesis of the multitude of experiences and insights, and aims to provide useful suggestions about future scenarios in the use of technologies for administrative services.

The shift from the industrial to the information society implies new expectations for citizens and businesses which should be addressed by administrations and technology providers. Universal, easy and permanent connectivity and access to information and services are the most important needs for citizens, especially in an age in which technological progress and political integration enhance and facilitate citizens' mobility. In the context of the information society, there are several critical factors in the

construction of the IT framework in order to provide advanced services to citizens. The key issues in engaging in such a task are scalability, flexibility, security and interoperability.

However, the technological perspective of e-government should be explored by also considering the economic and social impacts of network technologies on administrations as well as on cities as a whole.

The turbulent scenario of the new economy particularly stressed the efficiency benefits provided by the use of ICT in central and local administrations. By placing public administration and local authorities at the core of e-government initiatives, the focus of ICT within cities is reflected primarily in the desire to improve administrative procedures and practices and to address the problem of integration between front office and back office of governmental bodies. Consistently with the new economy approach, the accent was placed on technology and the radical benefits it was expected to produce, and in the supply side in relations between the public administration and citizens.

Despite the enthusiasm that characterized the first e-government initiatives and programs, the downturn in the new economy trends highlighted the weaknesses of such a perspective and the need for a more concrete and realistic approach in the implementation of ICT within cities. In the knowledge economy, in fact, one of the most important elements in the emerging model of the city is related to the revision of the concept of citizenship, its characteristics, dynamics and means of expression. Cities are complex entities in which the municipal administration is just one of the players, where specifically citizens (and also businesses, associations, and nonprofit organizations) should be considered as vital contributors to the improvement of quality of life and the promotion of urban development.

Like e-business, the e-government theme presents numerous different facets. The chapters of this volume highlight four distinct subjects, each of which deserves specific attention. The first topic brought into discussion by the term e-government is that of new systems for the manifestation of consensus and expression of citizens i.e. e-democracy. Technology, especially on a local level, offers the perfect tool to revitalize the mesh of relations that the new organization of metropolitan space has seriously threatened. A second topic is the rationalization of public administration and its relations with citizens. The introduction of a new generation of technologies (particularly open standard technologies) constitutes a formidable tool for organizing and rationalizing bureaucratic administrations based on logic and procedures that are far from users' behaviors and needs. A third viewpoint enhances the meaning of the expression 'e-government' and is linked to the renewal of services and new forms of involvement of citizens, based on the capability for self-organization of individuals and

communities as well as on their knowledge rooted in daily experience of cities.

Linked to this third interpretation of e-government is a fourth stance, which has been strongly supported by the European Commission. This is the idea that e-government can become the engine of a new phase of economic development, underpinned by a process of grass-roots diffusion of technology among households. This intervention hypothesis sees the public administration as the primary engine of a process of computer literacy on a wide scale, aimed at the creation of an e-society on which to build the premises for an e-economy with solid foundations.

The book is divided into two parts. The first describes e-government issues from an institutional point of view, through the contributions of three distinguished authors who represent respectively the European Union, the European network of cities (Telecities) and the Italian Government. In the second part of the book, 16 case-studies of e-government projects in European cities are presented. The analysis is organized around the three key topics: e-democracy (chapter 4), Web service portals (chapter 5), and re-use of solutions and open source (chapter 6). The final chapter discusses the new scenarios for on line citizenship and e-government by analyzing such evolutionary trends through a comparison with e-business trends.

We sincerely thank all the authors for their valuable contribution as well as all the speakers, participants and organizers of the conference who made this book possible.

Eleonora Di Maria and Stefano Micelli

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I

DIGITAL CITIES AND E-GOVERNMENT: THE
INSTITUTIONAL PERSPECTIVE

Chapter 1

E-GOVERNMENT: EUROPEAN COMMISSION POLICIES AND ACTIVITIES

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1. INTRODUCTION

The use of ICT and new technological infrastructures to make public administrations more efficient, capable of delivering new services and getting closer to their citizens represents a major challenge for the European Union. In order to favor the development and adoption of technological solutions suited for these objectives, the EU supports public administrations at local and regional level to manage this transformation and to adapt their processes and practices according to the requirements of citizens needs and new technologies¹.

This chapter² will give an outline of what the policy context is in Europe, focusing in particular on two fundamental programs endorsed and supported by the Directorate General Information society: the first is eEurope 2005, which aims to bring Europe on line by the year 2005 in order to reach the Lisbon goals; the second is the European Research Area (ERA), whose objectives are to create a European internal market for research and to

¹ The views expressed in this article are those of the author and do not necessarily reflect the official European Commission's view on the subject.

² The presentation of Ms. Rosalie Zobel to the "On Line Citizenship" Conference is available at the Website http://it.sun.com/eventi/on_line_citizenship.

restructure the European research networks through improved co-ordination and new policies in supporting research initiatives.

2. POLICY CONTEXT

The Information society Directorate General manages a large research program, the IST Program, and also other policies related to the development of information society, e.g. telecommunications, on line security, confidence and trust in electronic networks, e-business and e-government infrastructure. The main objective for the IST Directorate is to reach the Lisbon Goal, to make the “EU the largest knowledge based economy by the year 2010.” The EU has already made several important steps toward it: EU countries have managed to reach the single market, the single currency, and it is quite clear that applying the mind of policy makers to this goal, it can be accomplished in the way the Lisbon Strategy states.

There are many policies contributing to the Lisbon objectives: one of them is the eEurope 2005 program, and the second is ERA, European Research Area. The next sections of the chapter will be devoted to the illustrations of these programs and their action plans (fig. 1.1).

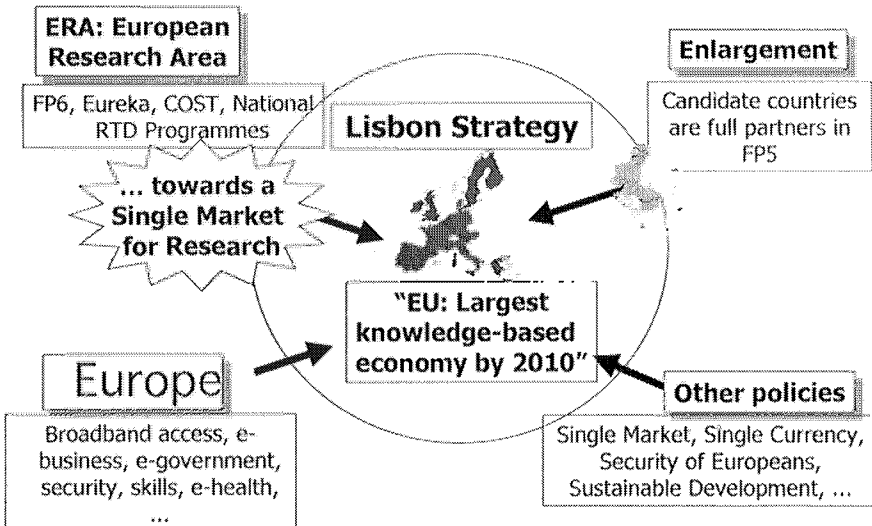


Figure 1-1. Policy Context

These programs and action plans will take place in the context of the enlargement of the European Union, which became effective in May 2004, with ten new countries joining the Union, a further three being candidates

and others applying to join the Union in the future beyond next year. Other European Union policies will act as a framework for the eEurope 2005 and the ERA program, in particular those connected to the single market, the single currency and policies related to the security of European citizens and to sustainable development.

3. eEUROPE 2005

eEurope 2005 is a program designed by the Directorate General for Information society and the Directorate General for Enterprise. It has been signed by all member states and candidate countries. It focuses on achieving specific policy objectives that are relevant for the take up of Information and Communication Technologies by the year 2005.

First of all, eEurope 2005 has the objective to modernize on line public services provided to European citizens by public administrations in the member countries, particularly e-government, e-learning and e-health services.

Secondly eEurope 2005 supports the growth of a dynamic e-business environment. E-business has been the source of concern, in particular after the dot com crash, but reading the economic press and specialized research publications, it is quite clear that e-business is having important effects in terms of productivity and competitiveness for companies.

With the main objective of achieving a dynamic e-business environment, the EU is paying particular attention to SMEs. One important challenge is to improve SMEs competitiveness through the adoption of e-business technologies and services. Other challenges the full potential of e-business are building trust and confidence, providing up-to-date skills through the provision of electronic learning services, guaranteeing interoperability among standards and solutions used in e-business activities.

A third stream of initiatives within this policy framework is to provide a secure information infrastructure. The EU has been working and is still working on security issues with long term plans. The achievement of this particular goal will be a relevant basis for the deployment of e-government and e-business platforms and services, due to the increased confidence and trust that citizens will feel in approaching these services and technologies.

Underlying all these objectives, an infrastructure goal has to be put in place by the year 2005, which will consist of all information and communication technologies ICT based applications on broadband networks. The main idea within this project line is to favor the widespread adoption of broadband technologies, to bring broadband to the less favored regions, supporting also the growth of the multimedia content industry.

These main goals will be supported by best practice development and sharing. The idea behind it is that many valuable experiences are actually being developed and monitored. They need to be disseminated in order to spread successful results avoiding loss of resources and investments in replicating initiatives that can be easily found around Europe.

Another important element in this policy-making framework is benchmarking: the EU found that setting a benchmark and comparing different activities and projects to it, gives a strong drive to those administrations that are not performing well or that are missing some important factors in their plans to develop new services for their citizens through ICT.

eEurope is not a funding mechanism. Its objective is to mobilize all kinds of existing funds and existing programs in member states. The role of the EU is to co-ordinate effectively all these existing plans, initiatives, financial resources, in order to achieve the Lisbon goals.

eEurope 2005: an information society for all³

The Barcelona European Council called on the Commission to draw up an eEurope action plan focusing on the “widespread availability and use of broadband networks throughout the Union by 2005 and the development of Internet protocol IPv6 ... and the security of networks and information, e-government, eLearning, eHealth and eBusiness.”

The eEurope 2005 plan succeeds the eEurope 2002⁴ action plan endorsed by the Feira European Council in June 2000. eEurope is part of the Lisbon strategy to make the European Union the most competitive and dynamic knowledge based economy with improved employment and social cohesion by 2010.

In this scenario Information and Communication Technologies will create new markets and will offer the opportunity to increase productivity, growth and employment. They will also act as facilitators for businesses and citizens in achieving higher levels of productivity and well-being through the use of information technologies as tools for accessing improved government services and information.

The role of the European Union is not only to provide an investment-friendly legal framework but also to take part in specific initiatives that stimulate demand and reduce uncertainty for private investors. The European

³ This section is based on “eEurope 2005: an Information society for All”, communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of Regions, available at http://europa.eu.int/pol/infos/index_en.htm

⁴ eEurope 2002 Action Plan is available at http://europa.eu.int/pol/infos/index_en.htm

Union is acting on both sides of the equation: it initiated e-government, e-health, e-learning initiatives to foster the development of new services on the demand side and it is also acting on the supply side, stimulating the development of broadband infrastructures and working on security issues.

The eEurope 2005 action plan is structured around two groups of actions which reinforce each other: on one hand it aims to stimulate the creation of services, applications and content; on the other hand it addresses the underlying broadband infrastructure and security matters.

The action plan states that by 2005 Europe should have:

- a) Modern on line public services;
- b) E-government services;
- c) E-learning services;
- d) E-Health services;
- e) A dynamic business environment.

As enablers for these, Europe should have:

- Widespread availability of broadband access at competitive prices;
- A secure information infrastructure.

The achievement of such ambitious results will depend on four interrelated set of tools and measures.

First of all the Action Plan focuses on policy measures to review and adapt legislation at national and European levels. The intervention of the Union ensures that legislation does not hamper the development of new services. Further to this, it strengthens competition and interoperability and improves access to a variety of networks.

The second set of tools and measures aims to facilitate the exchange of experiences and good practices, as well as the sharing of lessons learned from failures. The objective of these measures is to ensure a rapid roll out of successful initiatives and the rational management of financial resources. Replications of projects and initiatives already started in other countries or administrations should be avoided. The intention is to broaden the applicability of best practices and to develop guidelines and templates from them.

Thirdly, policy measures will be monitored and better focused by the benchmarking of the progress made in achieving the objectives and of the policies supporting them.

Fourthly, an overall co-ordination of existing policies will bring out synergies between proposed actions. A steering group will provide a better overview of policy developments ensuring a good information exchange between national and European policy-makers and the private sector.

Proposed actions

The present section will give a brief summary of some of the actions proposed in the eEurope 2005 Action Plan.

a) *E-government services*

Broadband: all member states should aim to have all public administrations hooked to broadband networks by 2005.

Interoperability: by the end of 2003 the Commission issued an agreed interoperability framework to support the delivery of pan-European e-government services to citizens and enterprises. It was based on open standards and encouraged the use of open source software.

Interactive public services: by the end of 2004 all member states should have ensured that basic government services are interactive and exploit both the potential of broadband networks and of multi-platform access. This will require back office re-organization, which will be addressed with the exchange of good practices and experience.

b) *e-learning services*

Broadband connections: by the end of 2005 member states should aim to provide all schools and universities with Internet access for educational and research purposes over a broadband connection.

e-learning program: by the end of 2002 the Commission adopted a proposal for a specific e-learning program. The Commission published an analysis of the European market for e-learning, including the private sector.

Virtual campuses for all students: by the end of 2005 member states supported by the eTEN and e-learning programs, should ensure that all universities offer on line access for students and researchers to maximize the quality and efficiency of learning processes and activities.

c) *E-health*

Electronic health cards: the Commission intends to support a common approach to patient identifiers and electronic health record architecture through standardization and will support the exchange of good practices on possible additional functionality, such as medical emergency data and secure access to personal health data.

Health information networks: by the end of 2005 member states should develop health information networks between points of care (hospitals, laboratories and homes) with broadband connectivity.

On line health services: by the end of 2005 the Commission and all the member states will ensure that on line health services are provided to citizens (e.g. information on healthy living and illness prevention, electronic health records, teleconsultation).

d) *A dynamic e-business environment*

Legislation: the Commission, working with member states, will review relevant legislation with the aim of identifying and removing factors that prevent enterprises from using e-business.

SMEs: by the end of 2003 the Commission established an European e-business support network, federating existing European, national and regional players in this field with a view to strengthening and coordinating actions in support of SMEs in the field of e-business.

Interoperability: by the end of 2003 the private sector, supported by the Commission, should have developed interoperable solutions for e-business, like for transactions, signatures, security, procurement and payments.

The “.eu” company: by the end of 2003 the Commission examined the possibilities to provide European companies with additional functionality linked to the .eu domain name, such as a trusted cyber-identity and other supporting operations (trustmarks and authentication schemes).

e) A secure information infrastructure

“Culture of security”: by the end of 2005 a “culture of security” in designing and developing information and communication products should be established. The private sector should develop good practices and standards to promote their consistent application. An intermediate progress report will be issued by the end of 2003

Secure communications between public services: by the end of 2003 the Commission and member states examined the possibility to establish a secure communications environment for the exchange of classified government information.

f) Broadband

Spectrum policy: the Commission will use the new regulatory framework for radio spectrum policy to ensure spectrum availability for, and efficient spectrum use by, wireless broadband services.

Multi-platform content: public authorities in member states and the private sector should aim to offer their content on different technological platforms, such as 3G, interactive TV, etc. The Commission intends to support demonstrations and research projects.

4. E-GOVERNMENT VISION

Several visions drive the research work and the policy development in this field.

The first vision, Open Government, strengthens democracy, transparency, and accountability. It allows co-operation among administrations at the local, regional and national level.

The second vision is to have inclusive and personalized e-government services, where everybody has equal access rights and opportunities and where human potential is used to the full. Another important feature of e-

government services within this EU vision is accessibility, by everybody from everywhere, whatever the instruments used. E-government services must respond adequately to each citizen's requests, meaning that a huge effort must be made in order to increase the personalization of services and technologies.

The third vision regards the productivity of the government itself, not only in terms of costs, but also in terms of responsiveness to the needs of the citizens, to the needs of the businesses, and the need for interaction between governments and citizens. The application of information and communication technology with adequate organizational change, well-managed, with skills development and training can create an environment which is much more effective, productive and responsive to the needs of citizens. The e-government objectives, within these visions, are about to manage change effectively, re-organize administrations, train employees and integrate legacy systems. Also important is the provision of secure access to services through different communication channels. Citizens will not use these services if they have no trust or confidence that their personal data will not be abused.

To reduce government costs, co-operation among administrations at different levels is encouraged using open standards and/or open source software.

A framework of co-operation among public and private actors is necessary in order to fully exploit public assets and resources.

Finally, the ultimate goal is to allow the citizen full participation in the democratic process and to support government policies through awareness and use of government services.

4.1 E-government Status

The status of e-government so far is that all member states have made significant steps in implementing e-government services. But, this varies a lot across Europe. The northern states, such as Sweden and Finland, provide many interactive services on line, which are functioning and being used by citizens. Central and south Europe are areas where much progress has been made but many efforts are still required to reach the level of deployments achieved in the former countries.

What emerged from researches and analysis made by the European Commission is that local and municipal administrations made more progress than national ones. This may be because it is easier to get everybody together to make things work at the local level. This evidence suggests that a reverse way of implementing technologies and services (from the local authorities up to the national or European level) can be an effective response

at the national level to manage the growth of a country's e-government infrastructure. At the European level things get more uneasy: it is still difficult to be a European citizen in this sense, as e-government services, if they are provided, are quite different in various areas of Europe. The issue of pan-European services has been taken into consideration recently and increasing efforts and initiatives will be focused on that in the future.

Many interactive services are still to be implemented in some European countries. Interoperability problems, but also different processes and organizational structures, are the basis of these difficulties. Other obstacles are substantially low management commitments in many administrations, a strong resistance to change, relevant shortages in strategic resources such as funds and skilled ICT professionals.

Some obstacles are potentially harmful for e-government projects in Europe. The EU is highly concerned about the increased skepticism of citizens due to usability and security problems. These systems are still quite difficult to use for less experienced people and there is a strong concern about the improper use of personal data, privacy concerns and possible problems of access rights.

4.2 E-government and eEurope 2005

Under eEurope 2005 some priorities have been agreed by the member states such as the reduction of interoperability barriers for pan-European services, the development of an interoperability framework and the promotion of open standards. The important objectives agreed are the development and the uniform provision of pan-European services, the deployment of mainstream procurement systems on line, the support of skills and the provision of trust and confidence through various communication channels. These will be the next goals to be achieved by the EU with the support of the 6th Framework Program (2002-2006).

4.3 E-government: Past Research and Future Landscapes

During the last ten years the EU, and in particular the Directorate General for the information society, has been involved in a huge research effort in order to give an adequate response to the Feira challenge. It is useful to give here a brief view over past and future e-government support policies and initiatives (fig.1.2).

In the Framework Programs 3 and 4, in the period from 1994 to 1998, some work was done on information and communication technologies for

Central Governments. In detail, the framework programs were aimed at supporting the harmonization and the interconnection of national networks, the co-operation among administrations and the integration of services.

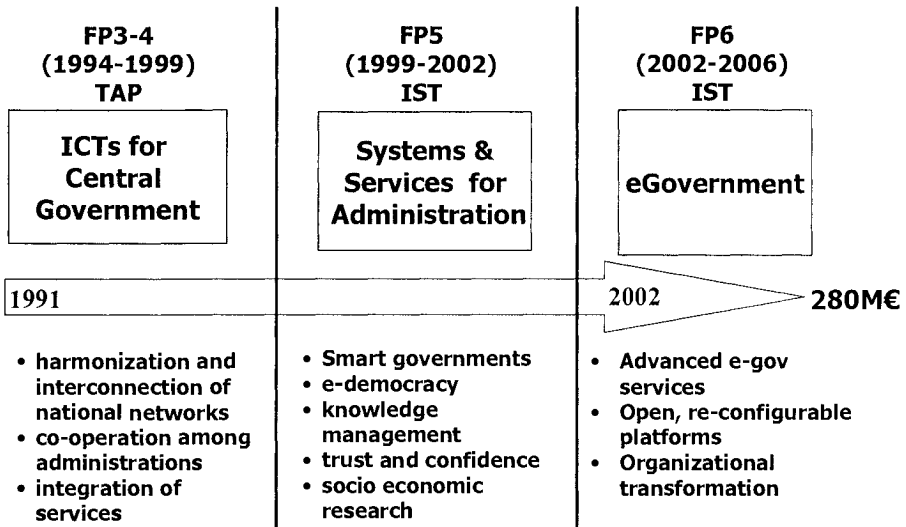


Figure 1-2. Ten Years of Research on E-Government

In the framework program 5, from 1999 to 2002, the European Union invested in systems and services for administration and in particular instruments for smart governments, e-democracy and knowledge management. All these initiatives were complemented by a strong drive towards the creation of trust and confidence and a number of socio-economic research initiatives.

As a brief example of what the EU has done so far, it is useful to examine the initiatives of the 5th Framework Program in detail. In the smart government area 36 projects were funded, in which 297 organizations were involved and for which the total amount of funds amounted to € 60.9 million. Many resources have been invested in the creation of intelligent systems for improving the provision of on line public services through a single point of access. One of those experiences is the FASME project. FASME was about assisting citizen mobility in Europe through IT-supported administrative procedures. The project is based on the development of a Java card with biometrics authentication. It had pilot applications in Cologne

(Germany), Newcastle (UK) and Grosseto (Italy). The Java card assisted administrative procedures such as change of residence, car registration and change of driving license. These systems are not yet implemented, but the successful trial provides feedback on using smart cards in authenticating citizens.

The other area involved in the 5th Framework Program is e-democracy. The central idea in e-democracy is to broaden the participation of citizens in societal decision making through on line debate. That does not mean only electronic voting but transparency in decision-making, up-to-date information on public affairs, supporting new and emerging forms of democracy. In this last framework program 11 projects were funded with a total funding of € 15 million, involving 73 participants. One of these projects is the e-poll program, which involved developing and testing an electronic voting system. Again, this program used smart cards. It was based on a high performance network infrastructure to support the e-poll network in a secure way. It has been piloted, so far, in two elections in Italy and in one election in France. It has been accredited as the official e-voting system in these two countries.

The period from 2002 to 2006 is devoted to the implementation of the 6th framework program, where the EU will concentrate on Europe-type goals in e-government, that means advanced e-government services, open and re-configurable platforms, organizational transformation.

Now the 6th FP is starting and the main focus in the e-government area is on information and communication technologies to support organizational networking systems integration and sharing of resources among administrations. Specific initiatives are orientated toward the development of dynamic collaborative network management systems, technologies for interoperability support, multimodal e-government services and knowledge management.

Finally, another EU initiative was the Ministerial conference in Italy from the 7th to the 11th of July 2003, at the beginning of the Italian presidency. The conference involved European ministers directly interested in e-government projects and initiatives, and its objectives were to consolidate and extend the existing consensus in Europe on strategic priorities for e-government and to present and exhibit local, national and regional success stories in the area of e-government. The conference focused on issues such as the role of e-government for European competitiveness and for the quality of life of European citizens. During the conference, e-government awards were given to the best of the good practice cases which had remarkable results.

5. RESEARCH POLICY: THE EUROPEAN RESEARCH AREA (ERA)

The eEurope initiative is closely connected to the longer-term perspective of research, the European Research Area. The European Union is willing to adopt new policies for research. The ERA initiative is to create a single market also for research in Europe. The main idea driving the project is to establish synergies between projects and activities in Europe, instead of many overlaps, in order to get the best out of different initiatives.

The European Research Area and research in information society technology contribute to eEurope 2005, particularly in fields such as e-government, e-health and broadband. The longer-term perspective of eEurope will be supported through the IST program, and also by national programs which are linked together within this European Research Area (fig. 1.3).

Within this scenario, the 6th Framework Program plays a fundamental role as a funding instrument in order to support the European Research Area. It also has new ideas built into it. There are thousands of projects, many of which are in the e-government area; many of which were quite small and sub-critical and had no particular multiplier effects. They could have been very interesting and important but their outcomes could not have been passed to others.

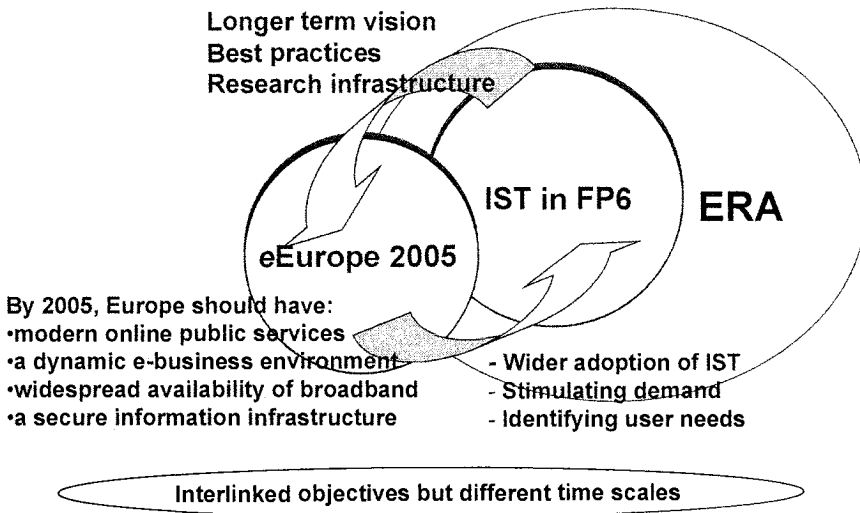


Figure 1-3. eEurope, ERA and the 6th Framework Program

The idea driving the 6th framework program and the ERA project is to pass to larger initiative-type projects, which are called integrated projects, aimed at concentrating resources, being more focused, being more goal driven and multidisciplinary. The main goal with these projects is to improve and magnify their scale and impact.

Moving away from project-thinking to initiative-thinking adopting new instruments such as integrated projects and networks of excellence and concentrating and focusing researchers seems to be the better path towards an increased impact of research initiatives in European countries.

European Research Area⁵

Research in Europe suffers mainly from three weaknesses: insufficient funding, lack of an environment which stimulates research and exploits its results, and finally the fragmented nature of activities and the dispersal of resources.

The EU is addressing these difficulties through a specific initiative, the European Research Area (ERA), which should allow to obtain the following results:

- The creation of an “internal market” in research, an area of free movement of knowledge, researchers and technology, with the aim of increasing co-operation, stimulating competition and achieving a better allocation of resources.
- A restructuring of the European research fabric, by improved co-ordination of national research initiatives and policies.
- The development of a European research policy which not only addresses the funding of research activities but also takes account of all relevant aspects of other EU and national policies.

The initiative was started by the reception and the adoption by all member states of the Communication of the European Commission (2000) “Towards a European Research Area”. The document defines some of the most negative obstacles for European research activities. The Commission stressed that not only is European expense for research lower than the expense in USA or Japan (being 1.8% of European GDP, as against 2.8% in the U.S. and 2.9% in Japan), but that this gap seems to increase on a yearly basis. Many other problems emerged from the analysis of the European research system: a lower percentage of the European population is employed in research (2.8 every thousand of the industrial workforce, as against 6.7 in

⁵ This section represents a synthesis of the European Commission Communication “Towards a European Research Area”, 18 January, 2000. The complete document can be found at <http://www.cordis.lu/era/concept.htm>

the U.S. and 6 in Japan); a huge and increasing deficit in the trade balance for high tech products; the lack of skilled and highly educated workforce, comparing the European situation with the U.S and Japan.

What is at stake in this scenario is the competitiveness of Europe in a global knowledge economy. To remain an important and competitive player, Europe needs to restructure its research activities and to support networks of European research centers, excellence centers and the like.

The European Research Area initiative mobilizes the public and the private sector in strengthening the European research system through many lines of action. What follows is a synthesis of the European Commission Communication on the European Research Area, in which some of the lines of action proposed are illustrated.

a) a stock of material resources and facilities optimized at the european level

This first objective can be achieved through the networking of centers of excellence in Europe. Mapping centers of excellence around Europe should be the first step in order to use ICT and broadband networks to connect them. The Commission is not concerned only with connecting and coordinating existing research centers, but also with creating new ones in order to guarantee the sustainability of the research system in the future.

Another important set of actions aimed at establishing a stock of resources and facilities at the European level is represented by a European approach to research infrastructures, covering the creation of new installations, the functioning of existing ones and access to them. The Commission is conducting an analysis of responsibilities (notably financial) on these three fronts. The objective is to assess the needs to be covered at the European level.

b) more coherent use of public instruments and resources

National research programs are substantially independent of one another. This prevents from exploiting synergies between programs. The EU is called to support the reciprocal opening-up of national research programs and to establish an information system, which allows the exchange of information and access to programs' details and aims. The opening-up of national programs will have to allow a broader participation by centers scattered around Europe. In this area the EU will play a role of initiator and catalyst by providing the member states with the logistical means and legal instruments best suited to coordinating research activities undertaken in Europe.

Another important step toward a more coherent use of public instruments and resources consists of the activation of closer relations between European

organizations for scientific and technological co-operation (for example CERN, EMBL, ESA, ESF)⁶. These organizations play a fundamental role in the European research and technology landscape and it would be useful to provide them with a framework in which they could discuss their respective roles on the European scientific and technological scene as well as their relations between one another and with the Union.

c) more dynamic private investment

An important actor in the development of a European Research Area is the private sector. The involvement of the private sector will be accelerated by a better use of instruments of indirect support to research. That means fiscal measures would be necessary in order to stimulate private investment in research and development. At a national level there are many successful mechanisms and instruments to promote the involvement of the private sector. The Union should play an important role in support of the establishment of a common framework for the exchange of good practices and the replication of measures, policies, and legislation.

Patents are another important instrument that protect the private sector rents from research and development and they need to be enforced at the European level. To date the European patent system is based on the issue of national patents, which are valid only in the member states in which they are issued. The Union plans to propose the creation of a standard Community patent to cover all of the European territory.

d) more abundant and more mobile human resources

Research professionals must not move only in and around Europe but also from the academic world to the business world and the reverse in order to improve co-operation between universities, between the academic world and the business world, between centers of excellence in different countries. The first step towards a network between research actors in Europe is the mobility of the human capital employed in the field of research, in order to develop social networks that are likely to support and strengthen electronic and institutional networks in the future.

This first step is strictly connected with the European dimension of scientific careers, which to date unfold normally within a national reference framework.

⁶ CERN: Europea Organization for Nuclear Research; EMBL: European Molecular Biology Laboratori; ESA: European Space Agency; ESF: European Science Foundation.

6. CONCLUSIONS

The ambitious goal of becoming the most dynamic and competitive knowledge economy by the year 2010 requests relevant efforts by the European Union in order to change the way in which public administrations at the local, national and regional level provide their services. Public administrations will play a key role in this process becoming the engine of the development of new technological architectures and advanced services in order to support the demand for e-government and e-business services by citizens and businesses in the Union.

Public administrations are facing great challenges like inclusion, openness, transparency, accountability and cost efficiency. In many problem solutions information and communication technologies can act as valuable support to organizational changes needed to meet the expectations of citizens, businesses and various stakeholders. ICT are a key component of EU policies as it has been demonstrated with the eEurope program and the European Research Area. Many significant steps have been made, but many are still ahead. Co-operation between local and regional administrations, interaction at the national and at the European level are key factors for succeeding in overcoming these challenges.

The European Union is adopting policies orientated to the full deployment of these technologies in order to modernize administrations capable of responding adequately to citizens and businesses. As the European Union enlarges and addresses its policy efforts to the realization of a knowledge-based economy, public administrations at the local, national and regional level are required to put in place innovative solutions, new ways of organizing and providing services, new skills and abilities in recognizing and responding to the needs of the society as a whole.

As stated in the previous sections, public administrations at the local level have been more successful, so far, in restructuring their organizational practices. This can be seen as the factor motivating the increasing interest of the EU in coordinating initiatives and actions, rather than in direct planning and in funding; the administrations at every level are required to co-operate and communicate with each other in order to generate synergies (as stated for research policy) and to pool resources and assets.

Thus the European Union, with the policies illustrated in this document and in many others, is encouraging a higher level of co-operation through the employment of network technologies and continuous exchange of practices, human and physical resources, skills and competencies.

Chapter 2

TELECITIES: THE ROLE OF CITY NETWORKS IN E-GOVERNMENT PROCESSES

Teresa Serra

President of TeleCities

1. INTRODUCTION

The objective of this chapter¹ is to give a comprehensive overview of the projects and activities undertaken by TeleCities in order to contribute actively to the development of an inclusive information society in Europe, with a particular focus on the role of cities' administrations as the fundamental engines of economic growth and social inclusion. The information and knowledge society represents a new form of social organization that will bring about increased economic vitality and an improved exploitation of the European social and intellectual capital. As a natural complement to EU's strategies and programs, TeleCities aims to place cities, local communities and local economic systems at the center of this new form of social and economic organization. As a matter of fact, cities and municipal administrations represent the first point of access to advanced administrative services, decision-making processes and policy-making institutions. Therefore, being cities and municipal administrations the first and more important *loci* of administrative and political innovation, TeleCities aims to support the European Union as well as national governments in the construction of a European Information society and a truly European citizenship, capitalizing experiences, innovations and new relationships that are being established and consolidated at the urban level.

¹ The presentation of Ms. Teresa Serra to the "On Line Citizenship" Conference is available at the Website http://it.sun.com/eventi/on_line_citizenship.

TeleCities is a network of cities focused on the development of ICT-based technological architectures and applications for the innovation of administrative procedures and organizational arrangements. E-government and ICT-based technologies and applications are conceived as instruments to create inclusive and distributed decision-making processes and to enforce the right of citizens to be included in policy-making processes. The following paragraphs will illustrate in detail how the European objectives synthesized in the Lisbon strategy will require an effective implementation and a purposeful action by cities in a cooperative approach, through the coordination, the mutual support and the exchange of knowledge and experiences granted by TeleCities.

The second paragraph will introduce the history of TeleCities, the goals it intends to achieve, its organizational form, its composition and its main institutional bodies. The third paragraph provides the reader with a detailed description of the 2004 Work Program, approved at the end of 2003. The main vision underlying the whole program is the creation of a *knowledge-based city*, which is seen as a key actor in the development of the information society in Europe and in the achievement of the Lisbon goals. Particular attention will be paid to frameworks for working groups' activities, such as the *eCitizenship for all* challenge that oriented working groups' activities until now, pre-eminently on the field of e-government, and the new *knowledge-based city* challenge, which comprehends the *eCitizenship for all* objectives and introduces new issues and topics to be addressed by working groups. The fourth paragraph deals with the issue of favoring the widespread development and enforcement of rights connected to the information and knowledge society for all European citizens in a more mobile and integrated European framework. As European member States succeeded in creating a single market and a single currency, they must face the challenge of creating a unique space for Europeans to enjoy their rights wherever they are and whatever the access technology they use. TeleCities is actively engaged in the development and widespread diffusion of e-rights and in the formal draft of a European charter of e-rights, whose basic guidelines are illustrated in the fourth paragraph.

2. TELECITIES: A NETWORK OF CITIES IN THE INFORMATION AND KNOWLEDGE SOCIETY

TeleCities was born in 1993 as a network of cities willing to actively contribute to the development of a society based on information and knowledge. Since its foundation, this initiative recognized the strategic importance of information and communication technology as a means to

improve municipalities’ effectiveness, to foster citizen participation in decision-making processes, and to increase the transparency of administrative procedures.

In 1993, representatives from thirteen European cities² participated in a workshop to discuss strategic issues concerning information technology, and decided to launch a network open to all European cities, expressing their willingness to collaborate with the European Commission in defining a strategic plan for the concerted development of technological infrastructures in the urban environment (TeleCities, Declaration of Manchester, 1993). The main objectives of TeleCities are, as expressed by the Declaration of Manchester, “to promote the exchanges of experience and to examine the issues related to the development of harmonized info-structures or telematic networks and services across Europe which will serve the development of local industrial and service sectors, local societies and citizens” (TeleCities, Declaration of Manchester, 1993).

Table 2-1. Number of members per Nation (2003)

	Number of cities
Austria	2
Belgium	3
Eastern countries	9
UK	20
Denmark	5
Finland	6
France	10
Germany	11
Greece	2
Hungary	1
Italy	14
Malta	1
Portugal	2
Spain	14
Sweden	5
Netherlands	7
Turkey	1

The city of Barcelona (Spain) holds the presidency since the beginning of 2002 to the end of 2004, while the vice-presidency is held by the city of Naestved (Denmark). In the last ten years, the network has reached a

⁸ The declaration of Manchester is the document that officially institutes TeleCities and it was signed by the cities of Amsterdam, Barcelona, Birmingham, Bologna, The Hague, Hull, Cologne, Leeds, Lille, Manchester, Nantes, Nice, Nottingham.

European dimension, with 124 members, 115 of which are local authorities and 9 are private organizations.

When considering the composition of TeleCities membership, we observe a sort of competition among countries in participating in the network. The United Kingdom has the leadership, with the highest number of cities involved (20). Spain and Italy are behind the UK, counting the same number of cities (14). If we consider the growing importance of Eastern European countries in the economic and social scenario for Europe, we hope that cities from those countries will join the TeleCities network in the near future.

The organization is run by a steering committee formed by one representative for each country, which is responsible for implementing the annual work program in accordance with the TeleCities budget approved by the Annual General Meeting (AGM) of all the representatives.

The main objective of TeleCities, the creation of a European citizenship through the development of digital infrastructures and services, requires a variety of actions, which can be summarized in four main areas:

- Influencing the European agenda to ensure that the interests of cities are taken into account in European policy-making.
- Fostering exchange of experience and knowledge transfer among cities, to guarantee a widespread diffusion of organizational and technological innovations at the European level.
- Informing TeleCities members on policies, programs and initiatives at European and local level.
- Facilitating and supporting the development of projects funded by the European programs that are supposed to be relevant for the members and the network as well.

3. TELECITIES ACTIVITIES IN DETAIL: 2004 WORK PROGRAM³

The four main areas of action illustrated above are articulated in specific strands of action in the annual work program evaluated and approved every year in the Annual General Meeting (AGM). To describe precisely which specific actions are undertaken by TeleCities, it is useful to summarize briefly the content of the 2004 work program approved in November 2002 which will be developed under the Barcelona presidency.

³ This section represents a synthesis of TeleCities 2004 work program, approved by TeleCities AGM, 26th November 2003.

3.1 Policy Development And Lobbying With European Institutions: The Knowledge-Based City

TeleCities aims to place the city-related aspects of the information society higher on the EU agenda. Priority will be given to acknowledge the role of cities in the process of achieving the Lisbon goals, which aim at “making Europe the most competitive knowledge economy in the world” by the year 2010. To this end, TeleCities aims to propose a strategic framework focused on the concept of the *knowledge-based city*, which is central in the whole TeleCities Work Program for 2004, approved by the TeleCities AGM in November, 26th 2003 in Porto.

The information and knowledge society is a new form of social organization, where equitable and ubiquitous access to information, knowledge and to appropriate content based on advanced ICT networks, should enable all people to achieve their full potential, promote sustainable economic and social development, and improve the quality of life for all. The generation and exploitation of knowledge is now the predominant factor in the creation of wealth. The shift to a knowledge-based society, prompted by new technologies and innovative flows of communication, is a powerful engine for growth, competitiveness and job creation. It is responsible for the renewal of urban and regional development and the promotion of environmentally sound technologies. Nevertheless, it carries important challenges and problems of an increasing digital divide.

The *knowledge-based city* is meant to ensure that these risks are minimized and that the benefits coming from the knowledge society are granted to all citizens, local communities and businesses. This means that all cities need to adopt long-term e-government strategies and visions, and use Information and Communication Technologies to innovate and modernize. Only by doing this, they will be able to offer high quality information and knowledge and the most advanced services, develop improved forms of governance and transparency, set-up innovative forms of education, protect users’ privacy and security, and contribute to the long term economic, social and environmental well being of their citizens, businesses and social partners.

Within this strategic framework, TeleCities aims at supporting all members in exchanging experience and developing concrete partnerships towards a common goal at the European level, as well as in ensuring a strong and stable position of TeleCities *vis-à-vis* the European institutions with a long-term perspective. The knowledge-based city strategic framework is based on the following four main challenges:

a) *Overcome the barriers to the development of the knowledge society*

The role played by cities in allowing the transition to the knowledge society is fundamental, because they can contribute actively in a number of areas. First, to ensure equal access for all to telecommunication infrastructures and the Internet, the collaboration among cities and the telecommunication industry will be a necessary condition to guarantee the implementation of broadband infrastructures at the urban level as well as to set up affordable and high quality Internet access services. Second, cities can overcome the threats of digital exclusion and of lack of trust among citizens through the development of networks of public institutions and organizations such as schools, libraries and other public spaces and facilities. Third, cities can play a fundamental role in increasing the digital literacy at all education and income levels, for all age groups, for men and women, for the employed and the unemployed and across all different ethnic groups through the collaboration with the private sector and various social actors.

b) Ensuring information and knowledge society rights for citizens

The advent of the knowledge society requires a redefinition and an enlargement of citizens' rights according to the new economic and social scenarios. In particular, issues of social and territorial cohesion will be tied to the development of competent, skilled and well trained social capital in order to ensure the wealth of local communities. A first class of fundamental rights is represented by the accessibility to digital information and communication infrastructures and user friendliness in public information services and applications. Public administrations are called to provide updated and complete information in each phase of the decision-making process, including deliberations, consultations and citizen participation.

The right to security and confidentiality must be granted by public administrations in the development of technological infrastructures for administrative services, in order to ensure privacy and confidentiality for citizens and their data and information. Services will rely on a secure environment in order to improve the trust of citizens and businesses and promote the development of valuable content, services and applications. To reinforce the fundamental right to education in the knowledge society, it will be now essential to support the development of lifelong learning to allow people of all ages and sectors to take fully part and benefit of the development of the information and knowledge society. To this end, TeleCities will develop a charter of European e-rights, to be promoted at the local, national, European and global level.

c) Foster the knowledge-based industries

Cities have a crucial role to play in fostering knowledge-based industries as well as in the creation of high quality employment. The future competitive edge of cities as business locations will hinge on their ability to integrate innovation in all sectors, especially those underpinned by

information and communication technologies. Therefore, cities must promote the ICT industry by fostering entrepreneurship, especially in terms of knowledge and cultural content exploitation with a particular focus on multilingual content in a culturally diverse Europe. Equally, it will be crucial for cities to support secondary and tertiary SMEs facing globalization and competition, in the necessary process of integrating ICT in their business and organization, including developing e-business and e-commerce strategies. All these measures will promote the economic regeneration of cities affected by job cuts in traditional industrial sectors, by helping them to fully grasp the opportunities of the knowledge economy thus ensuring the territorial and social cohesion expected by European societies.

d) Promoting the modernization of public service and e-government

TeleCities will continue promoting e-government “as a key in increasing productivity, transparency and efficiency of Public Administration, thereby freeing resources and delivering more value for taxpayers’ money”⁴. Local authorities are indeed strongly engaged in modernizing their organization by making intensive use of information and communication technologies to speed up administrative procedures, minimize paper consumption and facilitate information transfers and communications with the citizen, customers and stakeholders. To improve its own productivity, cities also have to undertake a difficult re-engineering process by pushing through significant internal changes, increasing the skills of the workforces in the areas of communications and information management, and pushing for greater professional training and know-how. Globally, this process aims at continuously increasing the quality of administrative public services but will also help to modernize many activities of high importance for citizens as education, health, transport and tourism, etc..

This framework will inspire all policy activities of TeleCities, being them oriented toward European institutions, national governments and local policy makers. At the European level a regular dialogue with the European Institutions will be maintained and specific policy contributions will be produced. TeleCities will therefore continue to co-operate with several Directorates of the European Commission, specific members of the European Parliament and of the Committee of the regions on several consultation processes and policy developments.

European programs and TeleCities activities

Sixth Framework Program (FP6). Regarding the 6th FP for Research and Technological Development, TeleCities continues to monitor how the

⁴ Ministerial declaration, Como, Italy, July 2003.

program develops and works to ensure that cities' priorities are acknowledged in future calls for proposals. A targeted action on eDemocracy will be pursued in cooperation with the e-government Unit of EC DG Information society. Some first exchanges with the Commission will also be sought on the 7th Framework Program for R&TD, due to be launched in 2006.

eEurope 2005. In synergy with its sister networks (Eris@⁵ and Elanet⁶), TeleCities cooperates with the European Commission to foster the role of local authorities in the Implementation of the eEurope 2005 Action Plan, which mentions TeleCities among the European platforms used to disseminate good practices at the local level. This will mean providing specific policy input to the several initiatives foreseen to achieve the goals established in the Action Plan. The implementation of the Action Plan will be supported through existing EC funding opportunities, whose work programs and action lines will be reshaped according to the new priorities of eEurope 2005.

Other Programs. TeleCities will closely monitor other EU Policies and Programs that are focal for its members and in line with the network priorities. Regular dialogue will be mainly maintained with the relevant representatives from the European Commission DG Information society, DG Regio, DG Employment and DG Education. Specific contacts will be developed with Members of the European Parliament and other institutions.

World Summit of the Information society (WSIS). TeleCities contributed to the preparation of the Lyon summit (December 2003) which gathered leaders from local and regional authorities and the civil society at the global level to influence the works of the Summit on information society held in

⁵ ERIS@ is the European Regional Information society Association. 36 European Regions and two corporate partners (Microsoft and Pricewaterhouse Coopers Europe) compose the association. The overall objective of the Association is to promote universal access to ICT-based services and applications in member regions in order to generate new employment opportunities, to improve the quality of services and the quality of life of citizens. To achieve this main objective, ERIS@ provides a platform for regions to exchange information and experience, and a forum to discuss policy development relevant to Regional development and Information society (<http://www.erisa.be>).

⁶ ELANET is the European Local Authorities' Telematic Network that operates under the endorsement of CEMR (Council of European Municipalities and Regions) and focuses on the development of the Information society at the regional and local level. The peculiarity of ELANET is to bring together the public sector and private-organized bodies represented by their telematic daughter companies. At present the network consists of representatives from 20 European countries and five technological partners (Siemens, Pinkroccade, Sonera, Engineering Informatica, Omega Generation).

Geneva on the 13th of December 2003. TeleCities will actively contribute to the preparation of the next World Summit, to take place in 2005 in Tunis.

At the national level, TeleCities needs to develop regular contacts with the relevant ministries of the European countries represented by its membership. Through the promotion of the network and its initiatives at national level, TeleCities aims to influence national governments' ICT policy development in order to allow a more city-oriented approach. This role will be particularly ensured by the cities representing the different member States within the steering committee and the national branches.

The key policy development activity of the network is carried out at the local level, where TeleCities aims to facilitate the promotion of the information society for all. The goal is to help local decision-makers to develop policies that use ICT to foster new modes of governance and to improve the delivery of local public services reflecting the needs of citizens and communities.

3.2 Information Provision

A second priority for TeleCities is to keep its members updated and informed about EU policy developments regarding the information society. This was mainly achieved through the following instruments:

The *e-Newsbrief* sent to members on a monthly basis. It provides information on EU policies, programs, calls, events in the field of information society and other relevant areas for TeleCities. Initiatives, partner search, projects and events from the members are included, to improve internal cohesion and communication among members. A three-month calendar of events is also included.

The *Eurocities Flash*. This service provides news relevant to cities on EU and local initiatives and policies, and it also gives regular insight into the activities developed by Eurocities and its thematic committee and networks.

The *TeleCities Website*. The network's database-driven Website is conceived as a tool to provide members with effective information on a wide range of issues as well as to promote both the network activities and members' news internally and externally. It has been designed to ensure more transparency and empowerment by the members around the main decisions influencing the life and the strategies of the network. The Website is composed of several sections: about TeleCities (AGM, steering committee and TeleCities coordination office activities), news, activities (working groups, events, projects, discussion fora), member profiles (for promoting members' activities), partner search, library and contact. Members can

contact the TeleCities coordination office to identify improved ways for self-promotion or tailored information services.

TeleCities Events. Conferences and working group sessions are used as an opportunity for cities to receive information about best practices, as well as on EU and national policies, funding and initiatives. Representatives from cities, the EU, national governments, businesses and other institutions are regularly invited to speak and participate in the debate and to help TeleCities in the development of policy contributions. These events play also an important role as tools for dissemination of experiences and initiatives of TeleCities' member cities. TeleCities' Events last two days: the first day is dedicated to plenary sessions aimed at providing participants with a comprehensive view on the issues at stake, on the results achieved by TeleCities and its working groups and on future perspectives. The second day is entirely dedicated to working group sessions, in order to place working groups in a concrete and real framework for collaboration, discuss activities and outcomes, design initiatives and projects, share views and experiences.

3.3 Exchange of Experience, Transfer of Know How, Networking and Integration

Since its creation TeleCities promoted the exchange of experience and know-how between its members through a number of events, each of which includes a public thematic conference and a day dedicated to TeleCities working groups. Several cities have applied to host events in 2004. On the basis of a detailed list of criteria, publicized on the TeleCities Website, the steering committee has selected a restricted number of hosting cities, which are listed below. The criteria include: the conference theme has to be clearly related to the current TeleCities work program, complete financial responsibility, etc... Cities interested in hosting a future TeleCities event should send an application to the steering committee, respecting those criteria.

Since TeleCities is a partner of EU funded projects with a role to disseminate the projects results and in some cases to validate the outcomes with potential users, the TeleCities Events might become a dissemination opportunity to the whole membership. This will be the case of The Hague Conference which will be organized in strong cooperation with the MUTEIS Project. Such a choice will allow a clear benefit of the projects results for the whole membership as well as a cost effective management of TeleCities resources.

For 2004, the following cities have been selected to host a TeleCities event:

- The Hague, 18-19 March (in close cooperation with the MUTEIS Project)
- Ronneby, 2-4 June
- Gijon, 29 September - 2 October.

The TeleCities Conferences to be organized in 2004 will be focused on themes that are inherent to the annual work program and overall strategy. The general themes of the conferences have already been approved by the steering committee in 2003 as part of the hosting application. The responsibility for the detailed conferences' program will be taken by the hosting cities, the president or the EU Projects consortium, with the final approval of the steering committee and TCO.

3.4 Working Groups

Working groups represent one of the core activities of the network. That is why they will focus on the strategic framework of the *knowledge-based city* and its four challenges. This framework wishes to include all the topics that have been addressed in the past years by TeleCities and those emerging from the growing level of specific issues that naturally emerge in the fast moving evolution of information society. This is why the four challenges have been defined broadly enough to be able to contain as many issues as possible.

Until now, TeleCities worked on the fulfillment of the "eCitizenship for all" challenge⁷, which was related to e-government services and applications as an effective instrument toward the development of a true European citizenship. E-government and information technology represent the two relevant factors in achieving full citizenship, but the concept of citizenship by which TeleCities is inspired is an old, though robust one. A quote of Abraham Lincoln about his desires for the role of government can be used to summarize TeleCities approach to e-government. According to Lincoln's wish, the government is *of* the People, *by* the People and *for* the people. According to this broad definition, TeleCities promotes and develops specific programs for e-government. First of all, government *of* the People means that it is elected representatively, tax-funded, transparent and responsible. Secondly, a government made *by* the people stresses the ideas

⁷ The eCitizenship for all Challenge emerged in 2002 from the PACE project (Public Administration and eCommerce in Europe) coordinated by Alfonso Molina, during the Rome presidency of TeleCities. The background document "Towards eCitizenship for all" by dr. Nick Lancaster and prof. Alfonso Molina is available on the TeleCities Website, <http://www.telecities.org/library/index.htm>

of participation, empowerment, and a strong involvement in decision-making processes. Finally, a government *for* the people means that it is inclusive, where added value services have to be offered with enough privacy and security for all.

Full citizenship means to grant individuals the right to access to public services in the most effective and convenient way, to actively participate in the democratic decision-making process, to equally take advantage of the benefits generated by developments in the information society, to have e-security.

The *eCitizenship for all* framework for working groups was divided into separate interrelated large challenges, all within the time perspective of 2010:

Re-engineering Services. all cities will have to re-engineer their services in order to improve the cost/benefit ratio and the quality of all the services they deliver to citizens, professionals and businesses. The primary objectives related to this challenge are:

- Increasing the provision of on line delivery of services, helping accelerate the development of e-commerce and the implementation of relevant legal frameworks.
- Fostering the customization of services and generate best practice examples that will relate to the many ways of ensuring the quality of information offered by the public sector.
- Improving the management of many internal re-organization processes needed. For example an improved organizational framework for the exploitation of public sector information by private firms and citizens would facilitate the creation of information products that cover Europe in its entirety.
- Increasing the e-learning possibilities for staff within public administrations, with a bottom up approach, that means through the gathering of learning needs expressed by public sector workers in order to design specific e-learning initiatives and to allow life-long learning.

e-democracy, all cities will have implemented e-democracy with all the new forms of citizen participation and community empowerment. The main objectives related to this challenge are:

- The improvement of the participation and consultation processes for citizens groups towards local governments; accessibility of government information, services and decision-making procedures on line; the development of new models of government relating to the empowerment of citizens in the context of e-democracy.
- The improvement in securing e-voting and in guaranteeing access for all users.

- The provision of public sector information through information portals in order to increase the awareness and the strength of the local social and economic community.

e-learning and e-inclusion, all European citizens will be digitally literate and able to benefit from the gains of the information society. These main goals related to this challenge are:

- Increasing the provision of e-learning and training for youngsters approaching the labor market; alignment of occupational skills with skills learned in educational institutions.
- Increasing e-learning initiatives for school students, helping to adapt educational standards to the digital age.

e-security and data protection, all cities will have to implement secured information systems in order to guarantee integrity and confidentiality of all the information and security to the users. This objective will be reached through a deep understanding of issues such as:

- Securing personal identification;
- Measuring plans of security on municipalities;
- Ensuring complete transparency in all administrative processes;
- Ensuring complete integrity and confidentiality when dealing with sensitive data.

3.4.1 The Knowledge-Based City Framework for Working Groups

The new framework for Working group activities is centered on the *knowledge-based city* challenge, which includes all the previous themes and several new topics. The rationale behind the adoption of this framework for Working groups is to guide the members to fulfill the mission of the network (policy making, exchange of experience, project development) in a well structured and targeted way, so to capture as much knowledge as possible and meaningfully use it for learning and promotional purposes at the European and local level. To this end, a final annual report on the *knowledge-based city* will be compiled and will include all the knowledge gathered during the year by each working group.

The Working groups will focus on the main challenges constituting the TeleCities' work program, with specific and focused projects and activities:

Overcome the barriers to the development of the knowledge society. This Working group would address several issues, such as broadband access for all; security, privacy and trust; e-learning contents and digital literacy for all, pas as knowledge providers, e-inclusion.

Ensuring information and knowledge society rights of citizens. This working group would address the promotion of a charter of European e-rights, which establishes a framework of guaranteed "rights" for all members

of society in order to benefit from the opportunities of the information society. These rights will set the framework for local administrations to develop policies and services that will support Europe to become the most competitive and inclusive knowledge-based economy in the world. The fundamental rights to be guaranteed by local public administrations are: rights to accessibility, rights to education and formation, information rights and rights to participation.

Foster knowledge industries. This working group would address several issues, such as delivery of high quality on line services for businesses, supporting and sustaining the development of ICT related growth sectors within the knowledge economy; convergent technologies - how ICT are combining with broadcasting and publishing industries in the development of a European e-media sector. In this field, working groups will face topics such as the Delivery of high quality on line services for businesses, Use of mobile technologies and located based services within PAs, Promote ICT Entrepreneurship and Innovation, Promote broadband access and e-business strategies for SMEs.

Promote the modernization of local public administration and e-government. TeleCities is committed to promoting e-government as a key in increasing productivity, transparency and efficiency of local public administrations. Many local public authorities are already engaged in improving their organization through an intensive use of ICT, and working groups in this field will provide them with valuable support through research and innovation activities on topics like re-engineering processes, advanced on line services in healthcare, education, tourism, culture, use of ict for risk management and civil protection, e-security solutions for on line transactions, open source software for PAs, Interoperability between administrations.

3.5 Project Development And Management

The exchange of experience and know-how promoted through TeleCities events and pursued by the activities of each working group, leads often to the development of common projects and initiatives. TeleCities is active in facilitating members in the development of new projects proposals, as well as in supporting the direct participation of its members in European projects.

The most important tool to support TeleCities members in proposing innovative projects and in participating in existing projects is the regular provision of information regarding European projects, calls for proposals, funding opportunities and European Programs. The network aims to function as a “clearing house” in which members submit their interests for projects and where matches between potential project partners are made possible.

The partner search will be ensured through the development of the partner search facility in the network's Website.

TeleCities aims to play a fundamental role in providing policy inputs in the context of the European 6th Framework Program for Research and Technological Development, developing proposals to be submitted to the European Commission for the development of more city – oriented projects.

Ongoing projects are:

MUTEIS. MUTEIS is a pan-European research project about Macro-economic and Urban Trends in the European Information society. The overall objective is to analyze the effects of the so-called “digital economy” on national economies in Europe, and to explore the way these effects manifest themselves at the level of urban regions. The research reveals developments over the 1990s, starting a few years before the Internet hype, and ending with the first signs of the dot-com crisis.

The analysis will improve the design and implementation of policy action on European, national and urban levels, to support Europe's transition into the digital economy in a sustainable way.

The first stage of the research project took place in 2001 and 2002. It is a comparative, in-depth analysis of the macro-economic growth performance during the 1990s of four countries that are frontrunners in the take-up of the digital economy in Europe: Finland, Ireland, The Netherlands and Sweden. We refer to these countries as “the FINS”.

The second stage concerns a detailed, more qualitative analysis of the most important regional and urban developments in these FINS countries. There are two phases of this stage. The first is now published and entails case studies in two different kinds of regions in each country. One region being the national frontrunner in ICT take up, the other being more remote, but apparently successful in ICT too. These studies are available in the publication *ICT Clusters in European Cities during the 1990s* (more details further down). The second phase will study the impact of the ICT clusters on other aspects of the society in the regions.

The third stage of the overall project extends the analysis to urban regions in four other countries of the European Union: France, Italy, Germany and Spain. This analysis took place in 2003.

On the basis of the research and analysis done so far, four key growth models - the so-called ‘four stairways to heaven’ - have been identified across the FINS countries: the Irish model, the Nordic capital model, the peripheral specialization model, and finally the international service city model.

Three Roses. TeleCities is one of the key partners in cooperation with Eris@ and ELANET of the Three Roses Project which started with a kick-off meeting on 13-14 January 2003. It aims at building a constituency of

actors, including cities, interested in submitting a project proposal under the 6th Framework Program RTD to develop open source software applications for local and regional authorities in the fields of e-government, e-learning and e-business. The main objective is to design a roadmap leading towards an Integrated Project (IP) to support the advancement of digital service delivery and the full integration of local and regional prime movers, including public administrations, in the European Research Area.

To achieve this objective, Three Roses has arranged an open platform in which potential participants in an IP will be able to debate and exchange views, by setting up a Website and a virtual forum, as well as holding workshop sessions, the first of which took place on 14-15 April 2003. The information, opinions and experience exchanged in this way will form the building blocks for the more focused discussion in the second Three Roses workshop scheduled for September 2003 leading to the roadmap for future integrated research.

Intelcities. Intelcities is an integrated project (IP) approved under the first IST call of the 6th FP – IST Program. The project aims to support achievement of the EU policy goal of the “Knowledge Society” by 2010 through advancement of e-government at the city scale, focusing on a range of citizens’ and business concerns about decision-making over regeneration and management of their local environment. It addresses the IST strategic objective of developing ICT to support (urban) organizational networking by constructing a demonstration of an Integrated Open System City Platform (IOSCP). The objective of the IOSCP is an integrated citywide information system continuously accessible to all (planners, developers, politicians, designers, engineers, transport and utility service providers and individual citizens) that will enable more inclusive decision-making and support more sustainable life-styles. TeleCities will take care of the dissemination of the project results to our wider membership, as well as the involvement of our members in the validation phase of the project. In addition, targeted dissemination activities (e.g. special sessions at TeleCities Events, or a fully-fledged conference) will be defined during the implementation phase of the project.

FLOSS-POLS. In 2004 TeleCities will consolidate its work in the domain of open source software in public authorities. To this aim, the work done under the Three Roses⁸ and the enormous interest of our members vis-à-vis

⁸ TeleCities is one of the key partners in the Three Roses project, in cooperation with Eris@ and Elanet. The project, started in January 2003, aims to build a constituency of actors, including cities, interested in submitting a project proposal under FP6 to develop Open Source Software applications for local and regional authorities in the field of e-

open source applications will feed into the FLOSS-POLS specific support action, funded by the 6th FP – IST Program. FLOSS-POLS (Free/Libre/Open Source Software - Policy Support) will start on January 2004 and puts together the expertise of the Three Roses and the FLOSS consortia. The primary objective of FLOSS-POLS is to investigate the use and the development of open source software across Europe.

Auxilia. In 2004 TeleCities will be a partner in the Auxilia project, funded by the EC Socrates, Leonardo and Youth Programs. This project investigates the use of ICT in learning opportunities for young people with disabilities. In particular it aims at creating a European model for the integration of young people with disabilities in schools and University through the introduction of supportive technology for e-learning. The project will involve local authorities, schools management, teachers and families to contribute to the development of a successful methodology for the integration of youth people with disabilities in formal education and social environments. TeleCities will be in charge of the Europe-wide dissemination of this project and will enhance the transfer of training material and knowledge.

Proposals submitted. In 2003 several proposals were submitted. Here we present a list of proposals currently under evaluation by the European Commission which are likely to start in 2004.

CEL-FLOSS-NGB. The CEL-FLOSS-NGB proposal (Constituency-building for European Leadership in Free/Libre and Open Source Software for Networked Businesses and Governments) is a coordinated action under the IST Program of the 6th Framework Program for Research and Technological Development, aimed to position Europe at the forefront of global efforts regarding open source for networked businesses and governments in local/regional economies.

GPOSS Tender. Besides the traditional involvement in projects, in 2003 TeleCities submitted a proposal for a tender on the usage of open source application for public authorities across Europe. Together with Three Roses, FLOSS-POLS and CEL-FLOSS-NGB, the GPOSS tender completes the full range of TeleCities activities in the domain of the usage and uptake of open source in cities across Europe. These four activities are meant to strengthen the position of the network in this domain. The GPOSS tender has been submitted under the call published by the IDA program (Interchange of Data between Administrations).

3.6 Other Activities

Cooperation with Deloitte. TeleCities will carry out its second year of cooperation with Deloitte to develop an yearly benchmarking study and Award on *eCitizenship for All*. The main results of the first year edition have been a database, owned by TeleCities and freely accessible by its member cities, containing specific information on their individual state as to the four aspects of *eCitizenship for All*: re-engineering processes, e-democracy, security and data protection, e-learning and inclusion. The first *eCitizenship for All* Award has also been successfully done and the second edition will be launched early in 2004.

Cooperation With ELANET and Eris@. TeleCities will continue and consolidate its co-operation with its sister networks, ELANET and Eris@. This will be done in many ways and types of activities, detailed below. The three networks have agreed with the European Commission (DG INFSO and DG REGIO) to maintain and consolidate an agenda for 2004, on whose items the three networks will provide regular input and feed-backs, as follows: follow-up of the Three Roses project on Open Source Software in local and regional e-government; benchmarking the information society developments at the local and regional level; broadband infrastructures; cooperation with accessing countries; the role of regions in research; dissemination of good practices.

Cooperation with the Global Cities Dialogue. Cooperation with the Global Cities Dialogue will be maintained during 2004. TeleCities remains promoter of GCD among its members; it is an observer member in the GCD Steering structure and will contribute to the organization of signatory and other events. Concrete initiatives will be developed within the TeleCities Working Groups, to which the GCD members will be invited, addressing specific issues, such as Security and data protection.

4. A CHARTER FOR EUROPEAN E-RIGHTS

Public administrations at all levels will be called, in the information and knowledge society, to guarantee the development and the enjoyment of new rights for European citizens. As the basic structure of the European social and economic space changes according to the increasing importance of knowledge and information, citizens and businesses will exploit their full potential only if the access to applications and services of the information society will be widespread and easy, and if ICT will be used effectively as instruments of change in policy-making processes in order to include local communities in the political and administrative agenda setting process.

TeleCities is committed in ensuring the effective recognition and protection of concrete and measurable rights of all citizens in the Information and Knowledge Society. These rights are essential to achieve a competitive and competent society in the digital age and to ensure social and territorial cohesion. The effective development and enforcement of these “e-rights” require a purposeful action towards the creation of a “charter of rights” that can address policy-making processes at every institutional level, putting citizens’ rights at the center of the European agenda. TeleCities started working on this charter, that will be the main objective for its working groups during the last year of Barcelona’s presidency.

The charter of e-rights will establish a framework of guaranteed “rights” for all members of society in order to benefit from the gains of the information society. TeleCities believes that if the administrations do not address decisively this issue decisively, some citizens will access the information and knowledge society and others will not, thus creating conditions of inequality.

The rights guaranteed by the charter will set the framework for local administrations to develop policies and services that will support Europe to become the most competitive and inclusive knowledge-based economy in the world.

The reasons for the definition of such rights are many. As citizens are the substantial part of a knowledge society, defining their rights allows, first, to draw up the interaction between citizen and the Information and Knowledge Society, and second, to determine which model of Information and knowledge Society is best suited to each European city context.

The TeleCities proposals on the charter of e-rights begins with the outline of what TeleCities thinks are the main e-rights to be developed in the scenario of European society. Basically, there are four sections

- rights to accessibility.
- rights to e-learning, that is the right to education during the whole life in a personalized fashion.
- right to information and communication.
- rights to e-democracy.

4.1 Rights to Accessibility

Rights to accessibility do not refer only to Internet access but, in broad terms, to access to every telecommunication service and platform. The development of broadband in every European region is essential to guarantee e-inclusion and equal access possibilities for all citizens. In this framework internet is one of the different channels within which administrative information and services are provided, but other technological platforms

experience a wide diffusion among citizens, as for example mobile phones. Local public administrations must reach every citizen through his or her preferred technological platform; otherwise, the simple reliance on Internet would act as a barrier for those who cannot use it or do not want to use it. In short, municipalities will have to provide services also through mobile phones and digital kiosks, for example, designing multiplatform services and infrastructures, providing thus connection and access everywhere and through every technological interface.

Access to services, in high information intensive environments such as the Internet and GSM networks, requires the assurance for citizens that their confidential data will not be abused, misused or inadequately diffused. The lack of security represents a barrier to access: as long as citizens do not feel confident with new digital services, they will not use them. The trade-off between opportunities brought by technologies and security, threatens to push citizens away from improved services and inclusion opportunities. In this sense, municipalities will have to act on two fronts: the first is related to the development of truly secure protocols and standards; the second is related to the creation of awareness and confidence among citizens and users. TeleCities is working on each of these areas, and has defined a range of emblematic actions.

In that respect, as an example, we can point out the next emblematic actions, regarding accessibility and security: implement the legislation in reference to the e-Rights of citizens, build a network of Public Internet Access Points (PIAP), define, spread and foster standards for Internet accessibility, monitor prices and quality of telecommunications operators services.

4.2 Rights to e-learning

The principles shaping TeleCities actions and strategies on learning and education is that all the citizens have the right to be skilled in order to effectively benefit from services and information delivered through ICT. New communication technologies detach learning from schools and universities and give the opportunity to develop new skills and competencies also to those who are already working or are looking for an occupation. While traditionally learning was accomplished in specialized institutions before entering the labor market, and learning and working were two separate areas of our life, now new technologies offer the chance to learn everywhere and anytime in the life of an individual. The eEurope 2005 objective of making Europe the most competitive knowledge economy of the world by 2010, will be reached only developing and implementing e-learning technologies and platforms that will effectively allow citizen to

update and redefine continuously their skills and competencies, in order to be more mobile and well endowed in the European labor market. In this wide perspective, TeleCities' aim is to identify which are the necessary projects to be implemented at the local level to guarantee these rights. In identifying opportunities and solutions for e-learning, TeleCities, as well as the European Union and other public actors, will have to work with firms in the technology sector in order to develop personalized technologies and services. Only responding to the citizens' requests for specific competencies and skills, and providing each citizen with the content and knowledge he or she really needs, e-learning initiatives will reap high returns in terms of employability and human capital. This means that public institutions, most of all municipalities, will have to screen the occupational structure of their territory and the potential development opportunities, gathering customized information about the learning needs of their citizen and addressing them with customizable platforms, content and technologies. Personalization is the key to life-long learning in this perspective: as far as every citizen can find services and content that respond to specific and personal need at any moment, he or she can design a personalized learning path, drawing from an existing and continuously growing knowledge base.

Among the emblematic actions identified, obviously the creation of all types and levels of educative courses in every language is the most challenging one. Other strategies are equally challenging and important, such as favoring the ongoing training of teachers as promoters of change in any educative environment and favor the ongoing training of specific groups such as immigrants, seniors and disabled persons.

4.3 Information and Communication Rights

The objectives of including citizens in the decision-making process and of making administration procedures more transparent, rely on the ability of municipalities and public actors in general to deliver complete and high quality information. The participant citizen is the informed citizen: thus information must be diversified and updated. These issues are strictly intertwined with those highlighted in the previous paragraph about accessibility: public information has to be easily understandable, delivered through adequate and differentiated technologies and platforms, personalized in its contents, according to the needs and the requests of every citizen. The ability to deliver to every citizen only the information he or she requires is crucial to the active involvement of citizens in administrations' processes and decisions. Segmenting and personalizing contents, technologies and access devices as well as services, avoids overloading the citizen with undesired and uninteresting information, and results in strong feedback and

involvement by individuals who are particularly inclined towards specific issues and topics.

The content delivered by information services are diverse in nature. The goal of public administrations is to provide every useful informative item to the citizen, from databases, registries and statistics, to policy documents and programs, studies and benchmarking. The information must be diverse also in its origins: municipalities and administrations in general will also have to provide information produced outside the public sector, for example, studies and reports produced by private firms, journal articles and the like. The diffusion of information must be performed with particular attention to privacy and confidentiality.

The emblematic actions on which TeleCities is and will be focused, refer mainly to information on administrations, which have to be the catalyst of content production. In addition, all information on available personal data has to be gathered from citizens with appropriate and sufficient guarantees of privacy, security and confidentiality.

4.4 Rights of e-democracy

As far as e-democracy is concerned, the increase in citizen participation to decision-making and policy-making processes is not only a matter of services and technologies. Providing access to digital services and content, though important, is not sufficient. E-democracy, meant as participation of citizens, regards the ease with which citizens can relate to the administration and, most of all, the accessibility of its processes and procedures. Public administrations will have to re-engineer their processes in order to make them understandable for citizens: that means that the whole administrative flow must be clear and its outcome, whether definitive or intermediate, must be public and available. In order to participate, the citizen must be aware of who is responsible for processes and actions, who works on them, how these processes flow inside the organization. Rationalization, re-engineering, transparency and access are fundamental prerequisites for the development of a participative citizenship.

Web portals, e-voting systems and platforms, content provision services are the outcome of this process of radical organizational redefinition by municipalities and public administrations. The design of effective interfaces, services, platforms and contents will be the result of an effective reorganization of the administrations around citizens and users of their services.

TeleCities believes that e-democracy will be the result of the development of other fundamental and basic rights and principles, which are: the right to a transparent public administration during the whole

decision-making process; the right to a public administration with deliberations, consultations and citizen participation; the right to a public administration actively engaged in responding to citizen participation and strengthening civil society.

Under these perspectives, the emblematic actions undertaken by TeleCities members are: the design and launch of effective systems which foster citizen participation in decision-making processes; the careful consideration of all of the technical options to ensure an effective response to citizen enquiries and to report the results of participation; the use of multiple channels (email, SMS) to encourage citizens to express opinions, suggestions and complaints.

5. CONCLUSIONS

Ten years ago, in 1993, thirteen cities willing to actively contribute to the development of the information and knowledge society, started to think about the opportunities that ICT would have brought to cities' administrations and, most of all, firmly believed in the importance of the exchange of experiences and the transfer of knowledge in a cooperative framework to ensure the rise of a European inclusive information society. The network has grown, counting up to 130 members, and still does, but its objectives remain unchanged: fostering the widespread access to digital infrastructures and services as the key for a more competent and competitive European society, with a clear focus on the role played by municipal administrations, local communities, citizens and businesses. The European Union and national governments are actively and successfully engaged in programs and initiatives oriented toward the achievement of the Lisbon goals, but their efforts require a strong enactment by local administrations, because cities and local communities are the loci of innovation. Within urban contexts citizens and businesses require new services and improved security and confidence; within cities citizens and businesses association participates in new ways and through innovative instruments (ICT) to decision making processes; local administrations, and in particular municipal administrations, represent the primary actors in creating innovative procedures, technological solutions, organizational arrangements aimed at responding effectively to emerging citizens' needs.

These beliefs drove the birth and the growth of TeleCities as a body that is a direct expression of the active engagement of cities and local public administrations in the process of creating a new Europe, within which ICT and an improved local government will allow the expression of the European social and intellectual capital at its full potential.

To consolidate the work of the last ten years, TeleCities is working on the elaboration and the launch of the Charter of eRights for all citizens, that will serve as a framework for all TeleCities' members in the creation of a more inclusive Information and Knowledge Society. The charter will represent a bridge between the results achieved by member cities and the future challenge they will have to face, that of building up European public services and make TeleCities a platform to stimulate local democracy, foster the full development of a European economy based on knowledge and contribute to the emergence of a real European citizenship.

Chapter 3

THE ITALIAN APPROACH TO LOCAL E-GOVERNMENT

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1. INTRODUCTION

This chapter describes the path towards the development of local e-government adopted by the Italian Minister for Innovation and Technologies (*Ministro per l'innovazione e le tecnologie*, from now MIT) in accordance with the system of local authorities (regional, provincial, municipal and mountain communities) that is to be followed over the next two years. This document does not attempt to provide yet another organized and reasoned discussion of the aims and goals of local e-government, which have already been amply addressed in the strategic plans on the information society¹. On the contrary, this work offers a contribution to the current discussion concerning the implementation phase, which involves all levels of government (from the European Union to small municipalities with just a few thousand inhabitants); in other words, which policies and which tools can be adopted to accomplish an effective action of innovation among local authorities through the adoption of e-government techniques, empowering specific local contexts in a unified national framework and within the European reference context. Our considerations, although developed on the basis of the specific nature of the Italian scenario, illustrate the criticalities

¹ Visit the Website at <http://www.innovazione.gov.it>. The presentation of Giulio De Petra to the “On Line Citizenship” Conference is available at http://it.sun.com/eventi/online_citizenship.

and strengths of an experiment that is still underway, but that has already generated initial results that are both original and clearly significant, and that constitute a helpful point of reference for the European debate.

The outcome of focusing attention on the methods of implementation will potentially provide a valuable contribution also for the European Commission, given that e-government is one of the fundamental themes of the eEurope2005 plan, and in respect of which the problem is not so much a matter of defining the framework but rather, and especially, defining the methods of implementation.

2. SPECIFIC ASPECTS OF THE ITALIAN SCENARIO

Many of the characteristics of the Italian experiment serve to highlight and leverage the restrictions and idiosyncrasies that distinguish the Italian reference context. Specifically, the elements that qualify these specific aspects are manifold and, as we will discuss further on, many of them are almost certainly unique and cannot be extended to other European countries, while others are more general and thus more helpful for comparison purposes.

The first element to be taken into account concerns the federal style reforms currently underway in Italy, which envisage a paradigm shift in the organization of the State. With the reform of Title V of its Constitution, Italy is gradually moving from being a largely centralized State to a State with strong federal connotations. This aspect constitutes an important and qualifying element in the Italian experience in relation to the extension of the experience and sharing it with other European partners. The new federal type of organization results in rising levels of responsibility of regional governments and local authorities in fostering the development of local economies and managing innovation in the territory. This allocation of power directly to those responsible for promoting and indeed implementing the innovation process inevitably results in an improvement in the overall efficiency of the system and improvements in terms of management.

The second element to be taken into account is that local systems in Italy (municipalities, provinces, regions) are the context wherein innovative processes have been most clearly in evidence, both in relation to public administration and, more generally, the information society. These considerations do not derive merely from a careful and detailed examination of what is happening in different parts of the country, but rather from a general awareness that acknowledges that local Italian territories and communities have the ability and potential to generate experiments and

projects that are frequently of significance on a national and indeed, at times, even international level.

The convergence of the two processes described above, on the one hand the radical reform of public administration and, on the other, the full deployment of technological innovation on a local level, underscores the importance of these strategies as two of the main engines of change. The two processes are closely interrelated and each constitutes the enabling condition for the other: in the absence of a pervasive and determined use of information and communication technology it is not possible to embark on an effective reform of the organization of the State and, in contrast, a radical break-up of the organizational structure is the factor that will make it possible to overcome the resistance to change that has thus far prevented the full development of e-government on a local level.

The final aspect, although certainly not the least important, is the shared conviction existing on a central and local level that ICT technologies are a key resource in order to ramp up competitiveness of territories and allow new methods of social and economic development to take root. New information and communication technologies do not constitute the goal but rather the means through which radical processes of change can be spawned in public administration, accompanied by new working methods, new forms of organization, and new processes. Information and communication technologies are the strategic resource that makes it possible to adopt a new approach to the problem of the relationship among local independent bodies and the need to coordinate and harmonize innovative processes on a nationwide level.

3. CORNERSTONES OF THE STRATEGY FOR THE DEVELOPMENT OF THE INFORMATION SOCIETY IN ITALY

3.1 Starting From The Local Level To Empower The Individual

In this context the Italian strategy for the development of the information society is focused, in the primary stage, on the development of e-government in the awareness that it is not possible to foster innovation in the territory unless local public authorities assume an active role in the innovation processes. Modern and innovative public administration is important not only because it improves efficiency and the quality of its services, but also

because it creates the prerequisites for social education towards innovation. In effect, it contributes in a fundamental manner to the fertilization of the territory in terms of resources, skills, and infrastructure destined to become a shared legacy for the entire local community and an enabling factor for integrated innovation processes that extend to include not only public administration but also private enterprise. In this context e-government constitutes a vital and enabling resource for the overall competitiveness of local territories.

Local public authorities are the natural front-end of the system, able to interface with citizens on behalf of the entire public sector. The decision to develop the use of ICT in order to rethink methods and times of provision of services has made it possible to identify local public administration as the natural repository of innovative processes. This is a key element in the Italian implementation policy, because the design and adoption of innovative processes within public administration, oriented towards service, does not respond solely to politically correct and shared indications that see the individual increasingly shifted towards the center of re-engineering processes, but also because it is not possible to achieve change in complex organizational systems other than by starting from the force expressed by the needs of the end user. Starting from the citizen has represented and continues to represent a core strategy of change management rather than merely reflecting the slavish application of the charter of European rights.

These important strategic considerations – to invest first in the development of e-government and only subsequently in the entire information society, to empower new technologies as a lever to re-engineer services from the front end, to focus on the individual citizen as a fully fledged strategy for the re-design of processes within local authorities – have formed the basis for the definition of a process of change whose key features can be summarized as follows:

- a) innovative processes must inevitably start from the authorities that distribute services to citizens. It has become necessary to promote the independence of local authorities, on the one hand, in order to stimulate the development of their creative potential and, on the other hand, to foster horizontal cooperation between parallel organizations (i.e. between organizations at the same level). This must be achieved while dealing with the additional complicating factor represented by the fact that this process started from the center (ministerial level);
- b) the national strategy in this context must inevitably derive from an interactive process of cooperation with local authorities in the form of a phase of induction of shared and systemic elements;
- c) cooperation between the center and local organizations is embodied also through the sharing of fundamental infrastructure created in a system-

based logic, constituted not exclusively by networks but also, for example, by digital maps for access to services, national portals, etc.;

d) to achieve horizontal cooperation the key element is to promote the reuse of solutions on a horizontal level between public authorities. This approach must therefore facilitate the crossover of solutions between bodies that provide comparable services, although in different territorial contexts.

3.2 Beyond Best Practices

Another important and, to some extent, original factor of the Italian e-government development experiment is constituted by the more or less explicit intention of bringing the best practice phase to a close. In other words, to move beyond the phase of investment in the dissemination of cases of excellence, since these are difficult to transfer as they derive from specific situations in terms of organization, technology, and professional skills, that are unsuited to replication. Attention has therefore been focused on empowering “good” solutions because while best practices are useful in obtaining official recognition, “good” solutions have all the necessary connotations for subsequent transfer. This strategy is clearly illustrated in the following diagram (fig. 3.1).

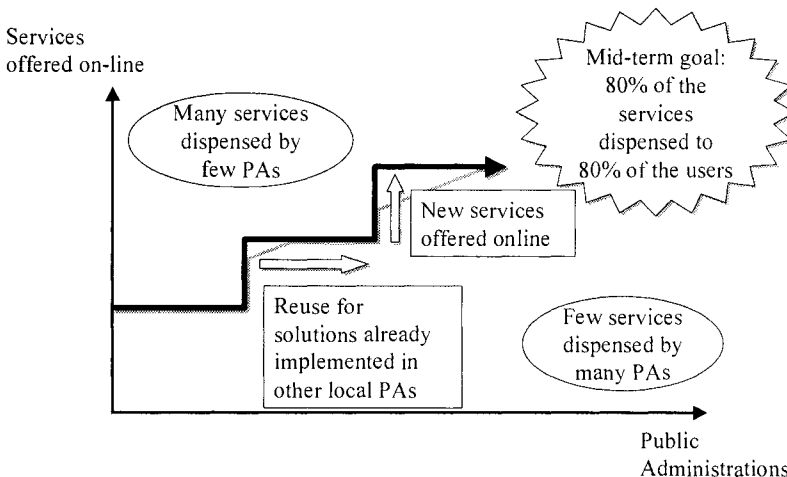


Figure 3-1. Path for the on line implementation of PA services to citizens and businesses

The top left of the graph corresponds to a highly innovative administration: this is the case of the best practices of the small number of local authorities that excel in the distribution of on line services. In contrast,

the bottom right of the graph is reserved for local bodies that distribute a single service (for example municipal registry offices): also this situation is clearly unsatisfactory.

The mid-term objective of the Italian strategy is thus located in the intersection between the two axes (top right), with 80% of services delivered on line to 80% of users (citizens and businesses). To arrive at this milestone calls for a path having a vertical section – the creation of services distributed on line (financed by the first e-government phase) – and a horizontal section – the re-use of services (financed by the second phase of e-government in the forthcoming months).

4. THE FIRST PHASE OF LOCAL E-GOVERNMENT: CALL OF 2002

The first call for the selection of e-government projects of regional and local authorities was published by *Dipartimento per l'Innovazione e le Tecnologie* (DIT - Department for Innovation and Technologies) in April of 2002 for the distribution of € 120 million in the form of co-funding for the creation of projects. The specifications of this call were agreed upon and defined with all local bodies: regions, provinces, municipalities, and mountain communities. The call focused on two basic goals: the first was that of transforming local public administration services into on line services (the call was mainly addressed to council authorities and municipalities); the second goal focused on the creation of infrastructure services on a regional level for the interconnection of all territorial authorities (in this case the natural recipients were regional authorities and other territorial bodies).

In addition to the specification of objectives, also the criteria behind the call and the selection procedures were defined, these effectively constituting the “rules of play” for the initial implementation phase that started in June 2002:

- the national network has been defined, to form a benchmark for the interconnection of regional infrastructure, identifying the reference technical standards to promote the convergence of projects in terms of technological architecture and to assure the interoperability of the solutions proposed;
- definition of a list of priority public services (40 for citizens and 40 for businesses) classified not in relation to the organization of the various administrations but rather oriented towards the needs of end users, using the “life events” communication metaphor which has already been tested successfully in several European countries;

- a reference organizational model has been defined with the aim of allowing the proposing administrations to better understand the implications of transforming a conventional service into an on line service in terms of organizational impact;
- processes of aggregation of the proposing bodies have been fostered in order to maximize the number of administrations involved in the funding. The higher the number of proposing bodies the higher the quality (and hence the score) of the project;
- incentives have been created for the inclusion of mechanisms of re-use for the solutions in order to promote the best and most rapidly available solutions and facilitate the exchange of experience and skills among administrations on a horizontal level. To this end analytical details have been requested with regard to the times and methods that the proposers envisage for re-use of their proposals;
- to achieve inter-project coherence at a national level and beyond, the convergence of individual projects has been requested with respect to regional e-government plans in order to facilitate institutional cohesion;
- moreover, to foster rapid and shared penetration (designed in accordance with shared standards) of the national services access card throughout the entire country, all projects were required to envisage a means of access to the new on line services proposed by means of said card.

In addition, the methods of funding chosen by the call (co-financing with maximum threshold of 50% of the total amount of the project) have meant that e-government initiatives receive funds not only from the local authorities proposing the individual projects but also from several regional authorities, which have expressed the desire to use their own funds (within specific limits) to cover the residual amount of project costs that are not co-financed by MIT.

The foregoing indications and criteria concern, as already outlined, the implementation plan of the first phase for the development of local e-government in Italy, although they can also represent, after suitable assessments of transferability and compatibility, and with the due degree of scaling, also the key elements of regional plans, of other national plans and of European policies.

Following this course of development, the first e-government phase has therefore witnessed the issue of the call in the Spring of 2002, the presentation of the projects (within 10 June 2002), the assessment and subsequent re-modulation of several projects that terminated in the winter of 2002, and the implementation of projects, which started in March 2003 and will come to a close by the end of 2004.

5. RESULTS OF THE FIRST CALL²

The response of local systems to the first call for the implementation of local e-government was extremely positive in both qualitative and quantitative terms. Specifically, in relation to the qualitative profile a diffused capacity for innovation among local administrations emerged throughout the whole of Italy (north and south) combined with a pronounced capability for horizontal aggregation, which, in particular, made it possible to avoid excluding smaller authorities from this critical process. Also of significance were the frequent choices of vertical type aggregation between various administrative levels, wherein larger authorities (particularly regional bodies) assumed a pivotal (non hierarchical) role, placing at the disposal of the entire network not only economic resources but also the projects and know-how that had already been developed.

Some facts and figures: a total of 377 projects were sent in for a total value of € 1,200 million, which is around 10 times higher than the budget made available by MIT. These were presented by local authorities that are globally responsible for the administration of 40% of the Italian population. The initiatives involved all regions, all provinces, and 3,400 municipalities (there are slightly more than 8,000 local councils in Italy), although it was mainly the small and very small councils that failed to apply, so the figure of 3,400 municipalities covered some 90% of the total population.

The projects inherent in services covered all priority requirements, or all the proposed life events, while infrastructure projects covered the entire national territory.

The assessment commission financed 134 projects from the approximately 400 projects presented and, in an important move that qualifies and empowers the results of this initial call, defined two thirds of the projects as “good”, thereby confirming the value and significance of local innovative capabilities. The total funding of € 120 million was divided as follows among the 134 projects: € 80 million for 94 projects aimed at setting up services for citizens and businesses, and € 40 million for 40 projects designed to implement regional or territorial infrastructure.

² For more information refer to *Primo rapporto nelle regioni di Italia* (First report in Italian Regions) published by the CRC project, April 2003.

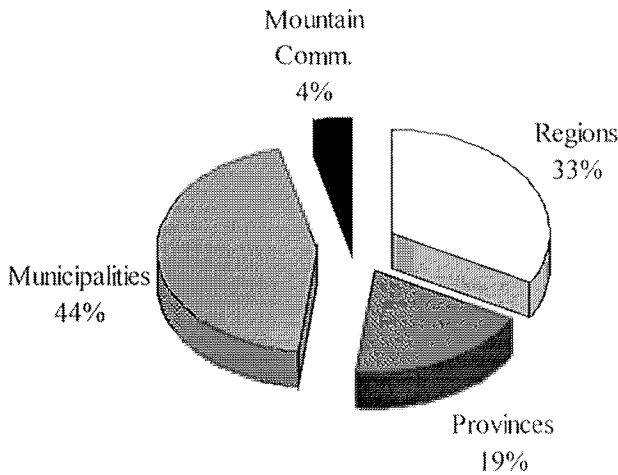


Figure 3-2. Distribution of funds in relation to type of beneficiary organization

Specifically, the bodies participating in the projects accepted for co-financing (before the re-modulation process) are distributed as follows: 19 regions, 95 provinces, 3,574 municipalities and clusters of municipalities, and 218 mountain communities. In addition to these bodies, which are direct beneficiaries of the funding, the aggregation also includes bodies which, although they are not due to benefit from the funds provided by DIT, participate in the implementation of services and infrastructure with their own resources. Specifically, these bodies are as follows: 79 health authorities and hospitals, 22 universities and schools, 16 central administrations and 8 prefectures. Figure 3.2 shows the percentage distribution of funds in relation to the type of beneficiary organization: regions, provinces, municipalities, and mountain communities.

Furthermore, on the basis of the specific nature of the Italian scenario and the importance of local communities, it is interesting to assess also the territorial capacity to create a system, frequently by aggregating around the regional administration, which assumes a pivotal role. For this purpose refer to table 3.1, which shows the percentages of municipalities participating in various capacities in the co-financed projects. Lower percentages of involvement of all local players show a relative disability of this territory to assume the connotations of a system, and the need to seek forms of

promotion and new organizational structures able to support the regional administration in the role of local pivot (also regional competence centers, discussed in detail later on in this document, were set up in view of this objective).

Table 3-1. Municipalities involved in the co-financing projects

Region	No. of co-financed projects	No. of co-financed projects that include municipalities	No. of co-financed municipalities	No. of municipalities on a regional level	% municipalities involved in the co-financed projects out of all Italian municipalities
Abruzzi	4	10	270	305	88.5%
Basilicata	5	7	87	131	66.4%
Calabria	3	11	256	409	62.6%
Campania	6	11	447	551	81.1%
Emilia-R.	8	12	201	341	58.9%
Friuli-V.G.	7	8	68	219	31.1%
Lazio	19	18	314	377	83.3%
Liguria	3	12	29	235	12.3%
Lombardy	18	19	550	1,546	35.6%
Marches	7	9	219	246	89.0%
Molise	2	3	81	136	59.6%
Piedmont	6	11	92	1,206	7.6%
Apulia	4	9	225	258	87.2%
Sardinia	3	6	240	377	63.7%
Sicily	7	13	184	389	47.3%
Tuscany	17	22	213	287	74.2%
Umbria	6	7	88	92	95.7%
Valle d'Aosta	0	1	1	74	1.4%
Veneto	10	9	105	580	18.1%
Trent-Alto Adige	3	5	27	339	8.0%
Total	134	203	3,697	8,098	46%

From the process of assessment of the projects, re-modulation of the same, and from the initial results that have emerged from the implementation phase, the following criticalities have been identified:

- frequently several projects concern the same territory; therefore, to avoid wasting resources and to support the scale economies typically associated with systems, forms of integration must be identified between individual initiatives;
- several similar initiatives (in terms of services provided) have been planned and implemented in different territories; these initiatives call for

suitable coordination to avoid duplication and economic inefficiencies. This consideration leads to a significant orientation towards the required level of re-use within the projects;

- significant shortfalls have emerged in the activities of project management both in terms of methods and tools; in contrast, the innovation projects that lead to radical changes in public organization through the combined action of several levers (training, technology, re-design of the service, etc.) call for an attentive and sensitive approach to project management. This situation leads to the support of projects through dedicated territorial structures (see § 8 in the CRCs);
- a large number of projects feature a significant technological orientation and, in contrast, place less emphasis on matters of organizational design and training; to bridge this gap, discussion is currently addressing the idea of devoting part of the remaining budget to strengthening projects in terms of organization and training.

6. THE SECOND PHASE OF LOCAL E-GOVERNMENT STARTS FROM “SHARED VISION”

The first phase saw the emergence of positive cooperation capabilities in the operational start-up of e-government processes on a local level. This collaboration has promoted and sustained the capacity for innovation of municipalities, provinces and regions, and has benefited from the activity of coordination that regional authorities exercise in their territories, thereby constituting a tangible critical factor for success in the implementation of e-government.

With the opening of the 134 e-government worksites of the first phase, it became necessary to shift the collaboration to a more advanced arena, which is indispensable for the implementation of the projects launched: in this context a shared vision must be defined for the implementation of e-government. This sharing process should not be self-serving, but should instead constitute a support element for that which increasingly appears to be the most significant and demanding innovative process in Italy: the reorganization of the State into a federal system.

The process of change of the institutional architecture of the Italian State in a federal direction has moved into the implementive stage. The achievement of federalism depends on the development of new and more efficient forms of administration that refer to the level of government expressed by regional authorities and the relative system of local

autonomies. While the transition of powers, skills, and public resources towards bodies that are closer to citizens, to businesses and to the territory empowers and stimulates the capacity for self-government on the one hand, on the other, in order to be sustainable, it calls for a new interpretation of organization, institutional relations, and “system” based cultural approaches. Without a shared systemic vision of all the institutional players – central administrations, regions, local bodies – expectations of better services are unlikely to be fulfilled and will inevitably produce significant economic inefficiency. Emerging information and communication technologies constitute a new strategic resource and a new enabling factor able to guarantee and support needs for coordination and harmonization of processes on a national level through the course of time. This potential, which is implicit in the use of ICT, has today become a requirement in the process of implementation of federalism that calls for equal-footed cooperation between the various institutional parties. It appears clear that this architecture cannot be implemented using traditional coordination methods and technology, requiring instead a radical, pervasive, and proactive use of ICT technologies.

Transformation of the State in a federal direction is therefore an extraordinary and unrepeatability opportunity for the reorganization of the majority of the Italian public administration, which can offer the full range of associated benefits both in terms of efficiency and quality of services supplied to citizens only if it is accompanied by a radical technological innovation process. This reform process therefore constitutes the implementative tool that ensures success in e-government policies.

This premise leads to the following definition of the goals of the development of e-government in Italy planned for 2003-2004:

- to empower and focus on relations between e-government and the implementation of an efficient form of federalism;
- to define a shared vision of innovation in the federal State, and a shared path for the definition and implementation of such a vision.

The subjects on which it has been agreed to define a shared point of view among the various levels of government and administrative responsibilities are the following:

1. interconnection between all public administrations and between public administrations, citizens, and businesses;
2. the access tools to the services provided on the IT channel;
3. the methods of dissemination of the services on IT channels;
4. the requirements to guarantee security;
5. architecture able to assure the interoperability of services on the national territory;
6. federated systems and re-use of solutions;

7. organizational structures for the implementation of e-government;
8. towards shared system architectures.

These topics can be developed at various different levels of analysis: the first is that of strategic vision, the second concerns the system architecture required to implement the strategic vision, and the third is that of the technological tools needed to put said architecture into place.

7. THE KEY THEMES OF SHARED VISION³

7.1 The Public Connectivity System (SPC)

Interconnection of all public administrations on both central and local levels is an enabling condition for the creation of e-government and a factor of promotion for the development policies of the information society.

This condition is currently in an advanced stage of realization both on a central level, via the combined public administration network, and on a local level, by means of the creation of regional and territorial networks. The current interactions between regional networks and the combined public administration network, and the cooperation developed between regional networks, are of particular significance.

The development of the telecommunications market and the need to supply an updated shared reference vision to the various networks currently existing and those in the process of completion, today make it necessary to define, jointly, the characteristics of the 'public connectivity system' (SPC). Among the main objectives of the implementation of the public connectivity system is that of exploiting regional experiments launched to the full, promoting interaction between regional and territorial networks and central public administration networks, achieving scale economies in the use of network services, promoting the telecommunication services market on a national and local level, supporting the development of territorial networks in the areas of the country still without such infrastructure, guaranteeing the inclusion in the system of all central and local public administrations, and ensuring interoperability and common standards of functionality and security.

³ For more information visit www.crcitalia.it and refer in particular to the document entitled "Visione Condivisa" (shared vision) approved by the joint table for the implementation of e-government.

Special attention will be paid to ensuring the quality and security of communication within the SPC. Quality and security aspects will be defined by specific regulations on a national level, prepared in agreement among all the parties involved, which will be binding upon the same.

7.2 The Portals System

The dissemination of on line services to citizens and businesses takes place primarily through the institutional sites of the administrations or through portals that provide joint access to the services. Therefore, there are currently multiple public portals at each institutional level produced in the initial phase of use of the Internet by the administrations. This multiplicity is frequently uncontrolled and therefore tends to confuse users, dissuading them from using the new services and failing to assure quality, reliability, and uniformity of interaction with the public administration.

It is therefore necessary to govern the articulation of public portals at various different levels (national portals, local portals, and sector-based portals) by means of a network of reciprocal relations that facilitate the user and promote the integration of services. This level of management must envisage the definition of a shared model of on line interaction with public administrations that maximizes “visibility” on the Internet and empowers the specificity of each service provider, while simultaneously ensuring uniform interactivity and certainty in the identification of the various service providers. The metaphor of life events utilized in the initial phase of e-government is a fundamental part of this model, but it must be developed and improved with further communication metaphors. The following will also constitute important sections of this model: the definition of levels of accessibility for all categories of users (e.g. the disabled), vocabularies of terms, processes and forms associated with the service.

In addition, the delivery of multi-organization services calls for the integration of the back office structures of public administrations: each administration, both central and local, must make its services available to other administrations to ensure the necessary level of integration.

7.3 Means Of Access To On Line Services

The transformation of public administration services into on line services, i.e. the primary objective of the e-government projects launched, calls for methods of access that are secure, easy, and that can be used for the services of all administrations.

The evolution of lifestyles and the extension of markets, also for small companies, means that citizens and businesses are potential users of the

services of several public administrations, and implies that access to said services must be assured irrespective of the digital identification means employed by the user.

At the same time it is essential to avoid the proliferation of digital identifications means for access to services (electronic identity card, healthcare card, tax card, regional services card, citizens cards for services etc.), and assure convergence towards a single standard, with broadly diffused characteristics of construction, distribution, and management, with the facility to be implemented nationwide throughout the country, and economically sustainable. This standard is designated “National services access card”, and trials of its implementation have now begun in several Italian regions.

It is important to underscore the existence of two indispensable conditions for the achievement of this goal:

- on the one hand, all the cards issued must be reciprocally interoperable, i.e. they must all comply with the common standard;
- on the other hand, the quantity of cards must be reduced and converged towards the smallest possible quantity.

The debate concerning the activation and deactivation of service cards should award a position of absolute pre-eminence and priority to the interests of card users (citizens and businesses) rather than the administrations that produce them.

7.4 Security

A public e-government system cannot disregard the concept of security. The promotion of the use of e-government services implies a high level of trust placed by users, citizens and businesses in the new services distributed by the administration.

An interconnected system of e-government services, distributed nationwide and driven by a plurality of players, automatically leads to the need to ensure the safest possible level of operation. It is common knowledge that the security of any given system depends on the weakest link of the chain, or network in this case.

It is therefore necessary to define a set of minimum shared safety standards for each actor in the system and to promote the accomplishment of said standards by means of actions of support on a national and local level. The main rules for the secure use of e-government services can be summarized as follows:

1. the coherence and confidentiality of information traveling on the network must be assured;

2. the sources from which the services are provided must be reliable and certified;
3. information of a personal nature must be available for consultation solely by the legitimate owner of the data;
4. in interacting with e-government systems, the user must supply the smallest possible number of details of a personal nature, and such details must be utilized solely to verify the entitlement of the user to gain access to the services;
5. it must be possible to grant authorization to access the services in accordance with the specific characteristics of the user (citizenship, membership of professional bodies, etc.) as attested to by the competent authorities.

7.5 Interoperability Of Services In Federated Systems

The federalism process transfers skills and powers to regions and local administrations. In many sectors, this implies the reorganization of existing central information systems and the development of new information systems on a local level.

Development towards a model of federal state therefore often involves the decentralization of information systems that were previously centralized:

- central administrations must re-address their systems, shifting from operative management to a decision supporting function;
- regional administrations must develop systems for decision making and addressing;
- provincial and local administrations must implement systems to support the dissemination of the services.

The networking of this new configuration of the information systems of the various authorities requires:

- a guarantee of coherence among different information platforms;
- the construction of an “interchange channel” between the systems of different administrations;
- the definition of a “shared language” to allow information to transit on the foregoing channel;
- the definition of a common management system able to assure the secure and efficient operation of the channel.

7.6 Federated Systems And Re-Use Of Solutions

The second e-government implementation phase will have as its main objective the creation, on a nationwide level, of the most important “federated systems”. The term “federated system” is used here to define the

information system supporting the service processes relative to a sector that is radically involved in the administrative reorganization arising from the implementation of the federalist reform. Examples of federated systems include the systems of employment, health, taxation, culture, the environment, and training.

The unrestricted realization of these systems calls for the involvement of central administrations, regions, and local authorities, each of which would be engaged in the process at varying levels of responsibility of implementation and management. The full implementation of federated systems implies:

- completion of all the services that each type of administration must implement to make the system fully operative in its territory;
- the diffusion throughout Italy of solutions through the re-use of existing projects and adaptation to meet the needs of each specific organizational context.

7.7 Organizational Structures For The Implementation Of e-Government

The implementation of e-government in the context of a radical reorganization of public administration in a federal direction calls for intensive and effective cooperation between all the different types of public administration. In order to be effective, this cooperation must not be limited to the level of political coordination, but must be transferred in the implementation and management processes by means of the constitution of specific shared organizational structures. Currently active structures of cooperation are as follows: on a central level, the permanent commission of regional presidents and MIT; permanent committee with UPI (*Unione Province d'Italia*), permanent commission with ANCI (*Associazione Nazionale Comuni Italiani*) and the joint table for the actuation of e-government (composed of representatives from the regions, municipalities, provinces, mountain communities, and central administrations involved in the implementation of the plan).

In contrast, the following structures are active on a local level: committees for coordination between region and local bodies and the networks of regional centers of competence for e-government and the information society. Specifically, this latter organizational structure calls for further analysis because it constitutes a national network of centers with significant territorial bonds with a regional base, with the aim of supporting and accompanying the development of local e-government: an experiment that is probably unique on the European panorama.

8. THE PROJECT OF REGIONAL COMPETENCE CENTERS FOR E-GOVERNMENT AND THE INFORMATION SOCIETY

Regional competence centers for e-government and the information society (CRC) constitute a new structure for cooperation, derived from the joint initiative of MIT and the regions, in order to support the system of local authorities in the implementation of e-government projects and, more in general, of the plans for the information society. In as much as they are mixed bodies composed of resources made available by MIT and regional and local administrations (largely co-managed by the parties involved and significantly biased towards the exchange and collaboration on an inter- and supra-regional scale), CRCs and their national networks constitute an initial example of a new organizational model emerging from the currently ongoing federalist process.

The idea of setting up the CRCs dates back to the end of 2001 during the phase of preparation of the 1st call for e-government, when the need for coordination structures emerged on both a regional scale able to support the regions in the execution of their natural role as a pivot of the entire regional system, and on a national level with respect to the activity of MIT. These converging requirements and the desire to respond to them with a joint solution are recognized and formalized in the protocol of intent that established the permanent commission for innovation and technology on 21 March 2002. Simultaneously, *Dipartimento della Funzione Pubblica* (DFP) and DIT agreed to address the “Project for training, information, and project assistance for local autonomous bodies in relation to e-government projects” – the subject of a specific assignment awarded by DFP to Formez (a DFP agency), by means of an initial convention subsequently extended until 31 December 2005 – towards training and consolidation of CRCs.

The objectives initially identified for the network of CRCs can be summarized as follows:

- a) to support and strengthen the competences of local authorities in the development of initiatives for e-government and the information society, in accordance with the objectives established by the government guidelines;
- b) to increase the attention and level of qualification of public decision-makers with respect to the problems to be dealt with, in relation to the driving role that they can assume in relation to change and the importance of operating as a system;
- c) to disseminate the models, approaches, and shared tools concerning critical aspects (organizational, management, cultural, etc.) of innovative processes in the public administration;

d) to develop cooperation on these themes in regional systems and on an interregional scale.

In practice, from the spring of 2002 two parallel and closely coordinated processes have been set in motion. On the one hand, an investigative activity started region by region, with the aim of arriving at the signing of the convention for the start-up of the CRC between MIT and the regional president. In parallel, the organizational and logistical requirements were verified, and the professional resources to be made available within individual CRCs were identified and selected in accordance with the regional referents.

The CRCs were thus designed as an instrument primarily dedicated to the organizational and functional aspects of innovation processes – problems related to training of human resources, reorganization of activities, management of change within and among the organizations – that are complementary to more strictly technological problems, which are better handled by specialized personnel from the public administrations and/or ICT companies. This contribution is provided by approximately 50 personnel operating in 18 local teams (as shown in fig. 3.3), made available by MIT by way of the national project, and a slightly higher number of personnel made available by individual regional administrations.

It is important to underscore the intention of the project to promote a national network between CRCs, construed primarily as a means for collaboration and exchange of know-how in a horizontal direction between CRCs, and also to facilitate the sharing of languages, tools, and professional identities, emerging thanks also to the services and activities managed at a central level. To facilitate this level of evolution and development of a network between CRCs, an important role has been identified in the progressive specialization of each of them with respect to one or more themes connected to local strengths of the innovation processes of the Public Administration.

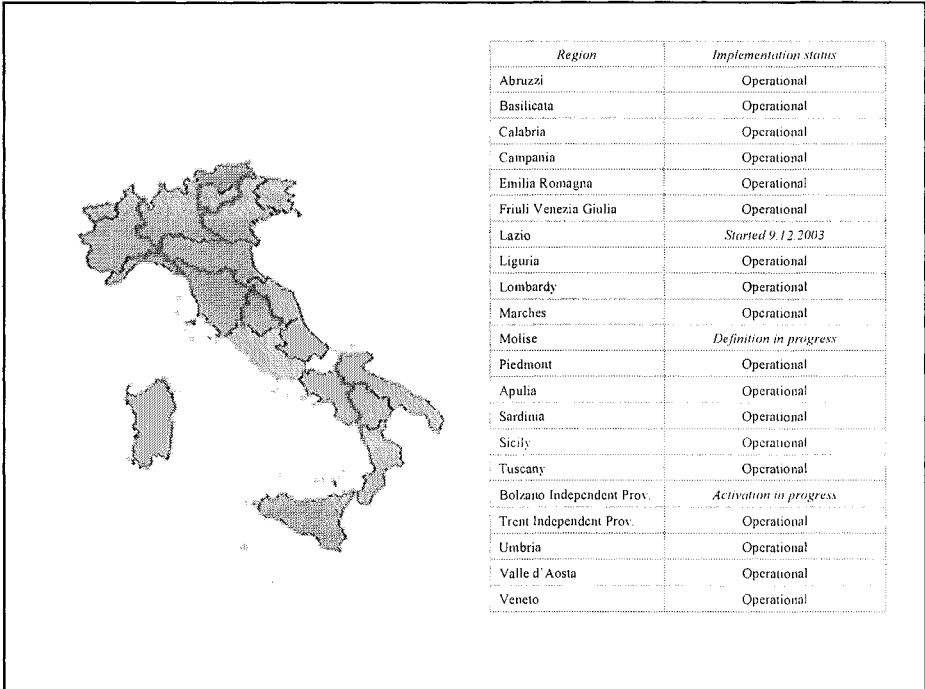


Figure 3-3. CRC implementation status

9. CONCLUSIONS: E-GOVERNMENT REQUIRES APPROPRIATE GOVERNANCE

As emerges clearly also from the experiment described in the previous pages of this document, the e-government development process, or the tangible implementation of e-government following the definition of strategic policies, calls for appropriate governance. It therefore requires a management model and structures in a format that can be broadly defined as 'governance'. The definition of the models and the constitution of new governance bodies is necessarily dependent on the specificity of the process to be supervised and guided. Since e-government employs network technologies as a basic and indispensable lever for its success, our experience leads us to affirm that, in parallel, the governance of e-government must also utilize the organizational model of the network. Rather than being a mere lexical simile, this is a fundamental need, the origins of which lie in the specific institutional and territorial characteristics

of the Italian scenario. The principles of implementation of Italian and indeed European federalism can be identified in the independence of the administrations and cooperation between them as equals in the context of a federal system of shared rules. The organizational model of the network enhances the independence – both in relation to decisions and competences – of each individual node, within the context of variable cooperative dynamics, or reciprocal adjustment processes that take place between individual nodes through the course of time in order to provide a fitting response to requests arriving from the surrounding environment. In practical terms, in order to provide an increasingly well-matched and efficient response to input from the external context, the network tends to modify its configuration: developing new relations, modifying the type of links existing between individual nodes, activating new links and freezing others resulting in a radical change in the basic profile. This capability to provide a dynamic response to external changes by modifying its system of relations means that individual nodes of the network are not only able to survive but to actually grow and develop.

E-government implementation processes also require a model of governance that respects the specific characteristics of individual administrations while simultaneously being able to create a dynamic network through time in order to gain access to and maintain the benefits deriving from “network economies” in the broadest sense (sharing of experience, re-use of solutions, benefits of scale, etc.). Two of the basic founding principles underpinning this model of governance are independence and cooperation. On the one hand, as we have seen above, these two values are at the core of network-based organizational models, while on the other they constitute principles of good governance that are widely recognized and shared. In accordance with our experience, it appears that a governance model applicable to e-government must be based on the independence of individual local administrations in terms of creative planning and exploration in the context of powerful and durable cooperative dynamics that are indispensable in order to share common strategies and resources. And it is clear that rather than pursuing solely the goal of innovation, such a governance model must also take steps to ensure that all administrations and social agents are able to fulfill their institutional role in an unrestricted manner.

II

EXPERIENCE AND INITIATIVES IN EUROPE

Chapter 4

E-DEMOCRACY: THE PARTICIPATION OF CITIZENS AND NEW FORMS OF THE DECISION-MAKING PROCESS

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1. E-GOVERNMENT AND THE NEW FORM OF CITIES

Discussion of e-government at the urban level is rooted in a dynamic scenario that is not solely based on turbulent technological innovation processes but is also influenced by the evolution of cities. Cities have seen an extraordinary level of transformation of their fundamental characteristics over the past decade, with the emergence of a new paradigm – the knowledge economy – impacting significantly on urban landscapes. More specifically, ICT was considered to have a substantial influence on the nature of cities. As powerful tools for connecting people and for transferring information cheaply world wide, network technologies seem to reduce the importance of space and location, in opposition to the tradition of cities built around the concept of agglomeration (Mitchell, 1996; Marvin, 1997; Le Galès, 2002).

Such discussion can be viewed in a more general framework of political and economic analysis that considers the impact of ICT on local agglomeration and physical proximity (industrial district, cities) as sources of competitiveness and growth (Becattini, 1998). On the one hand, with regard to the relationship between ICT and territories, studies focused on how information and communication technologies can increase opportunities of local economic systems to open and extend to a wider dimension, by

redesigning their economic and social connections globally (e.g. Antonelli, 1998; Sproull and Kiesler, 1991; Rifkin, 2000). On the other hand, departing in to some extent from this perspective, a second level of analysis considers the way through which electronic networks can transform forms of citizenship and leverage democracy.

These two issues usually refer to different geographical levels, the former more oriented to local contexts (cities), the latter more relevant on a national level (State). In particular, within the broader framework of e-government, the debate on electronic democracy was specifically considered to be a national issue to be managed and solved centrally (Snellen, 2001). However, as the experiences of the Greek *agora* or the Italian “*Comuni*” have taught us, an effective sovereignty of people is not achieved only by voting (formal elections), requiring rather a deeper process of direct participation of citizens in decision-making processes firmly embedded in urban contexts (De Cindio, 1999) (see chapter 2).

Following a brief overview of this complex debate, we will focus on e-government by means of a specific discussion of the issues related to the development and management of emerging forms of electronic government at the city level, in which the e-democracy perspective lies at the core.

1.1 New Technologies And Digital Cities

During the ‘90s, a lengthy debate on the future of cities in the digital scenario developed on the alternative hypotheses that cities would have change their roles: on the one hand in terms of global cities (a new hierarchy of cities world wide) and on the other hand by promoting the creation of networks of cities (Sassen, 1994; Knight, 1993; Dematteis, 2001). The contraction of physical distance gained through the use of network technologies opens new issues in relation to the real benefits of physical proximity, from a social as well as an economic perspective (Marvin, 1997; Castells, 2000).

The opportunities for people to engage in comprehensive interaction on line in a new dynamic environment increase the opportunities for experimentation and for a completely new form of social agglomeration, based not on traditional urban sites (the city square), but on an electronic arena (Mitchell, 1996; Turkle, 1995). With respect to the urban physical locus, an alternative concept of “cyberspace” was proposed to highlight the new social and economic arena where revised forms of business activities, information exchange and social experience can take place. As a consequence, some scholars have also predicted the rise of a new form of citizenship, related to the participation in electronic environment instead of

qualifications based on residence within specific physical boundaries (Mitchell, 1996).

In such a context, cities were expected to decline in their role as primary places of aggregation because of the reduced importance of distance. During Fordism, the centrality of location (Christaller, 1933) was a structural source for achieving gains in competitiveness for both businesses and towns and cities, as a basis for the specialization of the city and of its capability of offering high added-value services. With respect to the model of city developed around large companies (Esser and Hirsh, 1994; Mumford, 1999; Hall, 1997), network technologies have led to the dematerialization of economic processes and products, with associated impacts on their links with physical locations.

The recent rise and fall of the new economy has highlighted the pitfalls of considering information and communication technologies as the propelling force for a revolution in business organizations and economic activities (e-commerce) and in organizations towards an exclusively virtual domain (Tapscott, 1996; Kelly, 1998), while embeddedness in local contexts still appears to have a role to play in the process of value generation (Porter, 2001). The significant expectations on the potential of ICT in terms of value creation and economic renovation within a new paradigm – the *new* economy in opposition to the traditional economy - have failed to materialize (Porter, 2001). More specifically, the limits of the new economy were related to a marked focus on the supply-side of ICT, while, on the contrary, the importance emerges of the context of use and the experience of users for the development of effective ICT-based solutions (Hagel and Armstrong, 1997; Hagel and Brown, 2001). To sum up, rather than inputs able to foster radical change, electronic networks become enabling technologies for business improvement and for a more pervasive transformation of economic and social activities (Porter, 2001).

From an urban perspective, such a transformation of the economic (and technological) scenario also has major consequences in relation to the future role of cities. Alongside this general and intensive debate on the impact of ICT on territories as economic systems, attention focused on digital cities, especially during the '90s, has emphasized the interest in the wide variety of experiments aimed at redesigning cities through electronic networks (Graham and Marvin, 1996; Le Goff, 1991; Marvin, 1997). In its communication aspect, ICT provides cities with significant opportunities to both reorganize the internal fabric of social connections and maximized their openness to the outside and level of connection with other cities and communities world wide.

In this scenario, emerging e-government initiatives progressively attract increasing levels of attention both as a new form of ICT-based social

expression (civic networks) and as processes for the redesign of public services. As discussed in this book, ICT can have a positive impact on citizenship within the framework of e-government as opposed to a vision of administrative efficiency proposed by the new economy, as a source of tools to be used specifically to leverage the involvement of citizens in the democratic process. However, the urban level as a key layer in which to manage relevant e-government processes – primarily e-democracy – should not be taken for granted, because of the significant role played by central and European authorities.

Cities have traditionally developed social and economic relationships within their borders by exploiting physical contiguity and face-to-face interaction. Cities have always been identified as the place of generation of collective memory, where knowledge and experience expand, develop and are shared. In the emerging paradigm of knowledge economy, such a connection between distributed innovation processes and specific contexts leads to the identification of a new model for value creation (Von Hippel, 1988, Brown and Duguid, 2000). This new model is built on dynamic interaction and rich communication between supply and demand, based on shared languages and common systems of certification and risk sharing (Rullani and Romano, 1998). A model of this nature requires a firm connection with context as well as linkages between places in order to empower distributed specialization and embedded knowledge.

It follows that cities can continue to be or become an important source of innovation and a laboratory for social and economic experimentation or renovation, in the field of consumption, culture, environment, social activities, business, and so forth. Even more centrally, cities can view network technologies not as a threat for their internal cohesion, but for as new tools able to generate value by exploiting urban competencies and forging connections with parallel urban contexts. In the new scenario of ICT, the digital city increasingly becomes an emerging urban form that overlaps the physical city (Rullani, Micelli, and Di Maria, 2000; Dematteis *et al.*, 1999). From the standpoint of electronic management of government processes, this perspective offers new opportunities to broaden the scope of e-government initiatives and empower the contribution of citizens – as a new form of on line citizenship.

1.2 Three Perspectives Of e-Government

As a consequence of the frenzy that accompanied the emergence of the new economy, the urban approach of e-government, i.e. the implementation of electronic technological solutions for managing government processes on a local level, has particularly stressed the efficiency benefits provided by the

use of ICT. By placing public administration (PA) and local authorities at the core of e-government initiatives, the focus of ICT within cities is reflected primarily in the desire to improve administrative procedures and practices and address the problem of integration between front office and back office of governmental bodies. From this standpoint, the primary goals were the achievement of the advantages of reorganization in bureaucratic structures through the adoption of innovative technological solutions – namely Web service portals - and process re-engineering (Hagel and Brown, 2002). Consistently with the new economy approach, the accent was placed on technology and the radical benefits it was expected to produce and in the supply side in relations between the public administration and citizens.

However, in a broader perspective, we might query whether such approach is really appropriate (rather than simplistic) in relation to the potential associated with the radical changes underway in cities in the knowledge economy. The most important element of the emerging model of the city is related to the revision of the concept of citizenship, its characteristics, dynamics and means of expression. In the new paradigm, the role of bottom-up contribution, of active participation of people in shared projects, and the empowerment of experience, and knowledge from a range of places, persons, and sources is a key engine in the process of value creation (Rullani and Romano, 1998; Pine and Gilmore, 1999). Therefore, developing ideas about e-government based on the still relatively flimsy framework of the new economy increases the risks of promoting an underestimated and incorrect approach to the use of ICT within cities. Cities are complex entities in which the municipal administration is just one of the players, where specifically citizens (and also businesses, associations, and no-profit organizations) should be considered as vital contributors in the drive to improve the quality of life and promote urban development, construed as general objectives which should form a fundamental part of each e-government strategy (see chapter 3).

In this scenario, the three main topics presented to the attention in the “On Line Citizenship” conference held in Venice as discussed in the following chapters, can be explained specifically in the attempt to broaden the scope of e-government: from the use of ICT to achieve efficiency gains, to the empowerment of the contribution of citizens to the administration of cities and as a tool for organizing collective action. From our perspective, the core of such an interesting and challenging scenario is found in the identification and promotion of firstly the economic and secondly the technological conditions for sustainable e-government initiatives.

As regards the first topic, analyzed in this chapter, the development of e-democracy calls for a strong political commitment and a favorable national and international background in terms of integration and protections of

rights. Nonetheless, the promotion of e-democracy means, above all, a reverse approach in the relationship between Administrations and citizens, with a shift of power towards the latter and the consequent problem of how to re-organize and instill coherence throughout a distributed source of inputs. As in the case of business enterprises in their relations with customers and communities of customers (Hagel and Armstrong, 1997; Sawhney and Prandelli, 2000; see also chapter 7), the time, effort and resources required to launch and sustain a co-design-based form of e-government are the key issues to be solved by the administration and the key drivers for success.

The same benefits and problems are related to the opportunities for administrations in re-using technological solutions developed by other governmental bodies within their urban contexts. The extensive literature on open source techniques has attempted to outline the strengths and weaknesses of a distributed approach to innovation, with a special focus on ICT (see chapter 6). The aspects of interest for administrations are related to the economic advantages of re-use, access to open standards and easy integration, also by exploiting public-private partnerships, even though the main issues concern the control and exploitation of solutions with respect to a variety of contexts of use.

E-government considered in terms of the development and offer of Web-based services (see chapter 5) might appear to be the most linked to and influenced by new economy dynamics. On the contrary, an innovative e-government strategy arises from a revised vision of the city, in which the mobilization of citizens, the empowerment of their experience of the city and profound knowledge of the city, serve to transform the way in which public services are designed (co-design) and distributed.

Only from an integrated strategy based on a new perception of the city and its resources in all three directions, are we able to arrive at the stage of implementing e-government initiatives in which technology becomes a prime mover to improve the quality of urban life for citizens and thereby sustain renewed urban growth.

2. E-DEMOCRACY: EXTENDING THE PARTICIPATION OF CITIZENS THROUGH ICT

Network technologies are breaking down the barriers between citizens and government authorities both at a central and local level by overcoming traditional forms of connections and by offering new areas of civil expression managed electronically. Considering the e-democracy issue means understanding the potential transformation in democratic processes and in the political landscape of countries as a consequence of new way of

experimenting with the participation of citizens in technology-based contexts.

2.1 Towards e-Democracy: Introductory Remarks

In his provocative article *Capitalism, Democracy and Ralph's Pretty Good Grocery* (1999), John Mueller reminds us that democracy is the product of human nature. His argument is clear and rests on the assumption that citizens tend to display their contentment or discontentment in the way rulers administrate the society in which they live.

According to his reasoning, democracy is popular "because complaining is pervasive and apparently universal". Freedom of speech and organization is stressed in any democratic context as a fundamental principle on which democracy is based. Governments thus become democratic when citizens are allowed to make demands on those who are elected as representatives to govern them. Contrary to what some democratic liberals have stated, the cornerstone of most e-democracy initiatives is not an idea of *minimal citizenship* (i.e. the belief that people in a democracy merely need to calculate their own best interests and, if so moved, express them) (Milbrath, 1965). The confidence of citizens in all levels of government has fallen over the past few decades in both Europe and in the US. The reason for this is not merely related to a lack of awareness of political issues or how governments work. What seems to be required is a moderate level of involvement wherein citizens balance the currently conflicting roles of actors and participants: this can contribute to the maintenance of States that are more stable and responsive.

Fostering a better understanding alone is relatively ineffectual unless an accent is placed on the opportunity that people can exploit to influence the democratic process more than ever before. Participation in the democratic process therefore becomes the key to appreciate the value of the numerous attempts being made today to develop e-democracy as a tool and make the foregoing ideas more tangible.

Over the past years we have all been witness to a wide range of predictions about how the Internet and new technologies would impact on our lives as citizens and on societies more in general. Many have actually speculated about the extent to which the way people interact with one another or elected officials will change. Predictions have been both very optimistic and very negative. On one hand are those who believe that virtual communities are capable of assisting citizens to gain a more deep-seated experience of democracy (Beamish, 1995; Rheingold, 1993). The Internet's contribution to the political process may be that of accelerating and facilitating participation and making it less geographically constrained when

compared to traditional forms adopted thus far. For individual politically aware citizens, the net provides new opportunities to gain access to a higher quality of information, eliminating a range of different kinds of barriers. On the other hand, others fear that new technologies would tempt people to endorse “appealing packages” rather than engaging in a genuine process of democratic discussion. The positions of both promoters and critics are to some extent supported by various reasons. In this chapter, we intend to answer some of the questions listed below, attempting to understand and assess the political importance of e-democracy as a new form of involvement of citizens in the democratic process through the use of electronic tools.

More specifically, reasoning about e-democracy makes it possible to evaluate a series of relevant issues, highlighted during the conference, which can be summarized into few key questions to form the basis of the present debate:

- What kind of citizen participation is necessary in order to achieve a healthy democracy?
- How much do we actually need to know as citizens to be able to vote more responsibly and hold our representatives accountable for their actions?
- What should we expect from our local, regional or national governments?
- Will e-democracy yield higher levels of participation by better-informed people, altering well-established socio-political practices and processes?

The questions call for answers that depend on the way in which we manage to address issues and the many challenges that e-democracy has to overcome. As pointed out by Leda Guidi from the municipality of Bologna (see box 1) building an e-democracy framework calls for the appropriate management of the transformation and harmonization of procedures and services so that they can be accessed in an interactive manner on the one hand, while remaining coherent with the evolutionary trends of technology (diversification and specification of communication means) on the other. Still more centrally, the possibility of e-democracy taking root and becoming a tangible reality depend on a progressive detachment from traditional and consolidated forms of participation as well as on the modernization of forms of citizen involvement, thereby combating the current risk of an increasing deficit in the level of democratic representation.

2.2 Dual Level e-Democracy: National And Urban

On a broad perspective, e-democracy refers to the use of information and communication technology in the relationship between citizens and political/administrative bodies to encourage active and aware participation of

citizens in the decision-making process and in political life, both at a central and a local level.

The development of electronic technologies improves information sharing and diffusion. It also supports innovative forms of social participation, creating opportunities to increase the number and different categories of people (citizens) potentially involved in the political processes. Together with re-organization of administrative bureaucracies, government bodies have viewed ICT as a powerful infrastructure to better reach citizens as well as improve and intensify the level of interaction with them. Specifically, in the e-democracy scenario, for the first time citizens are presented with the facility to use technologies to render their role in the political and administrative dynamics more important and more active. Indeed, e-democracy is based upon a more direct participation of citizens in the decision-making process *ex-ante* (i.e. definition of needs) as well as *ex-post* (i.e. consultation).

As Teresa Serra pointed out (see chapter 2), democracy is a form of government “of the people, by the people, for the people”. Accepting the definition of what good government should be implicit in these famous words of Lincoln, we might notice that one of the defining characteristics of democracies is the fact that they can be thought as being responsive to the preferences of people. It follows that also e-government should be ‘of the people, by the people and for the people’, and e-democracy is expected to play its part in making this more tangible. In our perspective however, attention towards e-democracy cannot solely concern the citizen construed as a player in relation to the State-wide context, but must instead empower the contribution of individuals in relation to the surroundings in which they are most intimately involved, i.e. the local context.

E-democracy can be observed and analyzed in terms of general processes at a central level (central government – country) and at the local level (municipalities – cities and urban context). On a national level, developing an e-democracy approach makes it necessary to face major challenges in terms of the scale of the project to be promoted, putting considerable efforts into designing efficient infrastructure for citizens’ participation at the national level. In such a perspective, the main complex problem - and biggest opportunity - is that of achieving the wide involvement of large social groups, benefiting from the advantages of a top-down approach (i.e. national regulation). E-democracy is perceived, in this way, as a method of accomplishing goals of social inclusion, where the benefits of pressing for the adoption of technology by citizens for democratic purposes impact also on issues of the digital divide.

Instead, considering e-democracy at the local level, and specifically within cities, is associated with the concept of the new “*e-polis*” (De Cindio

1999), involving a shift that places power more directly in the hands of citizens. In this scenario citizens would be able to take advantage of ICT facilities (interactive tools, multimedia, network-based infrastructure, process management, etc.) to improve and control local policies on the basis of distributed access to the decision-making process.

The two previously mentioned levels at which e-democracy takes place can be perceived as naturally integrated because they refer to government authorities managed on a complementary basis (in this context, consider the principle of subsidiarity – strongly encouraged by the European Union). However, the promotion of e-democracy initiatives may lead to the emergence of critical issues in terms of the effective integration between the central and local level of political and administrative institutions of this type. The problems of integrating the two levels efficiently and effectively may be primarily related to the identification of the most suitable political approach to be adopted in managing such projects (top-down vs. bottom-up) and, secondly, to the relative technological issues.

As numerous authors remind us (e.g. Le Galès, 2002), the dynamics at work today in the global economy have proven able to undo the particular form of intersection of sovereignty and territory embedded in the modern state and the modern state system. A new geography of power has emerged within states together with a new way of distributing it (Le Galès, 2002). From a political standpoint, the process of decentralization, which many governments are currently obliged to deal with, increases the autonomy of the local level with regards to the promotion of new initiatives to be carried out locally – also stressing the variety of situations to be managed from a national standpoint. With respect to these challenges on a national level, local authorities could benefit from greater participation of citizens because of the direct link between citizens' lives and the local level of administration (proximity to political representatives, problems of the civic community, etc.). Thanks to this closeness between administrations and city dwellers and to the different feedback, proposals, and requirements expressed by the residents of different cities, embedded in different urban contexts, experimentation on e-democracy can take place in many forms.

E-democracy, therefore, also becomes a stage on which two alternative approaches may play an important role when properly interconnected: the top-down and the bottom-up approach to e-government (see below).

From a technological standpoint, central government could offer a relevant contribution to the development of e-democracy by defining a set of standards and procedures (national critical mass). On the contrary, public administrations at the local level may face more serious problems. Local authorities may either have insufficient resources to support sustainable e-democracy strategies based on experimentation, or they may be unable to

develop a replicable infrastructure that can be easily integrated with legacy systems and with other administrations. However, as stressed above, urban public authorities in particular may benefit from the commitment and enthusiastic involvement of local players, as many experiences of civic networks have shown in the past (Beamish, 1995; A.I.Re.C., 2001).

2.3 E-democracy: Enhancing Democracy Through ICT

Both representative and direct democracy are excessively one-dimensional for the type of society in which we currently live and work. Social contexts are increasingly complex. A higher level of inter-dependency calls for improved levels of mediation. In this context technology can play a key role, as suggested in this work. Direct democracy is seen as a fitting solution to the democratic deficit affecting all societies resulting from falling levels of direct citizen participation in decision making. This is a problem in terms of the quality of the decisions taken and the decision making process itself. This situation, coupled with the repeatedly stated awareness of public authorities of the importance of embarking on the proposed process of change amounts to a partial justification for the increasing interest in deliberative and participatory democracy through the use of ICT. The current system of government must change. More specifically, new more adequate tools must be developed to increase the understanding of policy makers of new demands emerging in the context of “rule by the people” in the information society we are shaping.

We need to assess the contextual role of ICT and reach an understanding of the extent of the potential role of this type of technology in democratic practices. Modern societies rely heavily on technological tools of mediation. It follows therefore that such tools can be used to build a new democratic system in which the “rule by the people” principle becomes more tangible. E-democracy can therefore be interpreted as an attempt to create improved mechanisms that can be used (by citizens and administrations) to transform demands into legitimate political and socio-economic outputs more effectively and more efficiently. In this context one of the key concepts to be considered is that of interaction. The Internet has provided a totally new perspective on the concept of interaction and that of communication, and it is perfectly reasonable to believe that technological convergence and mobile communications will foster increasingly high levels of interaction, giving room for further developments.

It is anyway true that computer mediated communication and information networks exert a positive influence: they have shown that they can offer a relevant contribution in increasing both transparency and pluralism (De Cindio, 1999). Some believe this should be no more than an introductory

phase, leading us to a broader e-transformation of society. It is certain however that we are witnessing an acceleration of the informationalization process that touches increasingly on our every day lives, in a context in which it appears perfectly plausible to consider that this will result in an increase in the diffused level of awareness of the democratic process.

When designing or evaluating e-democracy projects, we should always bear in mind that the importance of technology must be measured in accordance with a broad perspective. By itself ICT can produce both positive and negative effects, depending on its ability to effectively change habits and mindsets of all the players involved. ICT must be incorporated in intentional, controlled and institutionalized activities within a democratic system. Only in so doing can we ensure that citizens will experience the potential sustainable benefits offered by technologies for those who are keen to exert an influence on public affairs. We need to pave the way carefully in order to avoid a situation wherein technological mediation tools develop faster than the institutional arrangements in which they can be applied. At the same time, if we fail to develop technological and institutional solutions that are reciprocally complementary, designed for the people and by the people, we are unlikely to achieve satisfactory results. In any event, all these considerations taken together cannot diminish the capability of ICT to foster change and transformation. The future of e-democracy therefore remains open.

The idea of a European information society was introduced in 1993 (in a meeting of the European Council, held in Copenhagen) and its goals were defined in 2000 by the European Council. Promoting the development of the information society became a key priority, and as a consequence, also promoting e-government and e-democracy practices. Steps ahead have been made. As the analysis of the case studies presented at the conference will show, a common approach to e-democracy at the European level is still lacking. The most important divide among the alternative European approaches to e-democracy refers to the degree of electronic control applied to citizen's access and participation in the on line environment.

On the one hand we have countries like Italy (see also chapter 3) where e-government strategy has marked connotations of centrality (i.e. the role of the Italian Minister for Innovation and Technologies). In such countries e-democracy – considered as one of the tools in the e-government framework – is conducted by developing projects such as the electronic identity card. The identity of citizens is carefully checked, managed and protected on a national level, and stored on sophisticated electronic devices. Through innovative means which are actually not unduly futuristic, such as the Java identity card based on biometric authentication – similar to the card currently being tested in Cologne (Germany), Newcastle (UK) and Grosseto

(Italy) thanks to European funded pilot projects (see chapter 1) – governments intend to improve the efficiency of fruition of public services by citizens and their interaction with administrations. Such devices are the main tools through which citizens can gain access to political actions and administrative processes, but they call for profound re-organization of governmental rules and procedures as well as considerable investment in technological research and infrastructure. The underlying hypothesis of such initiatives concerns the need for high levels of security and certification in the on line identification process to avoid problems of privacy violation or unfair election procedures and results.

On the other hand, countries as Iceland support a more technologically flexible approach to e-democracy, based on more friendly solutions for citizens' participation in the on line environment (i.e. by giving citizens a PIN number as a single logon password to enter the e-government environment). In these cases the emphasis is on the potential that can be developed by adopting a bottom-up approach related to specific projects, where shared vision among citizens concerning needs and goals enhances spontaneous interactive participation (see also chapter 7). The main hypothesis behind this strategy is that the risks of unfair access and falsification of on line identity are remote, in consideration of the types of process that would be managed electronically – for instance consultation. At the same time those who support this type of e-democracy solution stress the fact that citizens in general express greater interest in participating within a user-friendly electronic environment (see the Tampere experience described in box 5).

ICT and electronic networks are seen as enabling technologies in supporting the access of citizens and the reduction of barriers between administration and citizens. Applications of technology to e-democracy have been implemented in many directions, characterized by different degrees of involvement of citizens and differing levels of potential impact on the political and administrative processes. In brief, technologies used for e-democracy purposes focus on three directions (A.I.Re.C., 2001; Watson and Mundy, 2001; Grönlund, 2001; Casapulla et al., 1998):

a) information diffusion and transparency of administrative goals and procedures

E-democracy is based on developing improved Web-based access to political and administrative structures. The aim is that of increasing the awareness of citizens with regards to the background of the officials responsible for political and administrative actions and with regards to the practices adopted (phases, goals, results, etc.). In this context, the main technological tools employed are Web service portals, which are promoted on a local and national level (see chapter 5 for a detailed analysis).

Transparency of decision-making processes is one of the main purposes of e-democracy and the Web is a powerful tool that can be exploited in this direction (see the Gdansk experience presented in box 2). Through Websites administrations can also provide up-to-date information on public affairs, at lower cost and with higher levels of penetration than possible when using traditional communication media (Gustafsson, 2002).

b) e-participation

On line participation of citizens in the decision-making process through active involvement based on interactive technologies is at the core of the e-democracy strategy. Technological solutions as *fora*, electronic forms, bulletin boards or e-polls offer citizens the opportunity to become actively involved in political life by sending in comments and suggestions, and by expressing opinions that must be taken into account by decision-makers. Those technologies open up the decision process to citizens at the early stages, since administrations can stimulate the acquisition of proposals, suggestions or new ideas coming from the many social groups contacted. By exploiting aggregation capacities and the characteristic capabilities of technological networks such as Websites and mailing lists, citizens are placed in a position wherein they can organize independent projects and generate proposals based on shared requirements, and submit them to administration authorities. Those tools are also useful in the final stages, where pervasive consultation using multi-channel opportunities (see the Parma projects in box 3) can help achieve the democratic goals of participation of the population. The most important aspect to consider is that citizens would be consulted before final decisions are taken, hence avoiding negative consequences (Orr, 2000).

Strongly interdependent on information sharing and transparency of processes, participation of citizens through electronic networks can be seen as one of the first experiences of the involvement and interaction of people using IT as expressed by on line communities and specifically civic networks (Beamish, 1995). By exploiting network technologies, community networks grew rapidly in many cities, developed thanks to the efforts of promoter institutions such as Universities (Casapulla et al., 1998; Hauben and Hauben, 1995). Based on pioneering U.S. experiences of freenets, these initiatives were mainly aimed at facilitating interaction among citizens through shared technological infrastructure. In recent times, local administrations are awarding significant emphasis to the advantages of efficiency derived from information and communication technology (ICT). While the first use of ICT focused on supporting spontaneously developed communication processes among people, projects carried out by local administrations are focused more directly on implementing fully-fledged e-government trials.

Those two approaches seem to refer to alternative models for the use of electronic networks within the context of cities. On the contrary however, from the perspective of e-democracy, those two paths are actually complementary, since they can be viewed as major opportunities for the development of cities as urban social and economic places made possible by the innovative use of civic networks. Civic networks have all the necessary potential to become powerful tools to promote new public and private services customized around the demand of citizens and businesses with the direct participation of all the players involved (links with Web service portal initiatives). Moreover, local communities could greatly benefit from electronic spaces of this type, where they would be able to build points of aggregation and discussion of shared problems, thereby entering actively into the decision-making process.

c) e-voting

Remote electronic voting can be defined as “an election process whereby people can choose to cast their votes over the Internet, most likely through a Web browser, from home, or possibly any other location where they have Internet access” (Rubin, 2002, p. 40). E-voting is one of the most controversial aspects of the debate concerning e-democracy. It is considered as the final important goal to be achieved in e-democracy strategies. It is an example of how network technologies can offer new opportunities to improve the way in which the will of citizens (the vote) can be expressed, by increasing the efficiency and effectiveness of consultation with citizens.

There are both advocates and opponents of this practice. Those who believe in the potential of Internet voting warn us that we will miss an invaluable opportunity to foster the development of democracy if we fail to consider its advantages (convenience, long term cost savings, 24-hour availability over several days, enhanced management of results). Voters could be freed both from wasting time – queuing to exert their right to participate in the decision-making process – and from the trials of road congestion, adverse weather and postal service issues (Hoffman and Cranor, 2001). Disabled people could vote unassisted. E-voting could help re-energize an electorate that appears less inclined to exercise this important civil right year by year. It could also greatly increase the overall turnout rate (McCullagh, 2003).

Although ICT appears to have massive potential in this direction, the negative experience of the new economy boom should make us think twice before relying on it too heavily. While skeptics acknowledge the possible benefits we could enjoy by adopting Internet voting, they also warn us. They are concerned about how effective the net would be in boosting the turnout, for example. Voters – they argue – could just as easily be inhibited from taking part in the process, even though for different reasons. Lack of

technical expertise perhaps the primary reason although it is not the only one. Security and privacy of on line voting are important matters (that must be addressed carefully) as is the potential that this new practice could disadvantage those who do not possess computers or who do not have Internet access at home.

Governments and officials are debating about the readiness of the technological landscape to support voting activities. Caution is the key word. The technology has begun to prove itself and has given cause for hope that we could use it still further to implement revolutionary practices, helping us to build a democracy that is more firmly based on the expression of the will of citizens. A phase-in process might be of some help: it would perhaps be preferable to bring in Internet voting gradually, thereby avoiding problems already experienced in electronic (non-Internet-based) voting. Proceeding too fast implies running the gauntlet of a range of serious risks, especially in the domain of security (which is not to be underestimated). The same properties that make PCs vulnerable as a secure e-commerce platform make them vulnerable as secure voting platforms (Mohen and Glidden, 2001). This, according to opponents, represents one more item of proof that, since the Internet is an open architecture that was designed without contemplating the issues now assailing the Web, it is not unlikely that it will prove to be an inappropriate environment for the casting of votes by citizens.

Vote selling, vote solicitation and vote registration are other issues raised by those who do not believe we are ready to implement such an instrument. Following this train of thought, both researchers and practitioners acknowledge the importance of defining universal guidelines to exert much needed controls and best govern political election practices. We need grounded third-party analysis, improved detection and blocking of intrusion and code migration and standard software (plus a range of other factors). And these are not the only issues to be dealt with. We believe Internet voting could mitigate disparities in citizens' access to power and participation in government, though we are doomed to fail if certain key political and social issues are not addressed correctly. E-voting brings a range of exciting opportunities, but it also raises many doubts.

In this respect a phenomenon deserving due consideration is the issue of the digital divide. Affordable access to the Internet becomes vital: it is a key issue to address if governments wish to rectify the divide between the "info-rich" and the "info-poor" in a more equal information society. Given current inequalities in terms of access, it can be justifiably argued that remote Internet voting represents a new-millennium test (Philipps and Von Spakovsky, 2001). Equity of access is therefore matter requiring urgent solution. New policies need to be properly designed and adopted to overcome difficulties that could impede the achievement of further results

and obstruct e-democracy as a means to improve the quality of the decision-making process in our societies.

Because of the relevance of this process for the future of local and national government, e-voting systems are currently under evaluation and experimentation to solve identification problems (security, privacy) related to this use of technology. Different sets of functional requirements for e-voting systems have, thus, been produced in numerous countries. They integrate the requirements imposed by existing (traditional) general election systems. However, the scope for action is wide and there is much to be done. Many people believe that the use of electronic voting systems must be considered more as a being complementary to traditional voting systems. In other words traditional systems are a long way from being completely replaced. It is expected to remain the principal instrument for conducting a general election process, supported by an e-voting capacity that is to be introduced only gradually (Phillips and Von Spakovsky, 2001, Mohen and Glidden, 2001). In the near future the most likely and valuable use we could make of e-voting will be in smaller local elections (municipal and school district ballots), because the majority of those elections are relatively risk-free.

2.4 The e-democracy revolution

To sum up this initial analysis of electronic democracy, the key questions to be addressed when considering the scenario refer not only to technological issues, but also to the political domain.

First of all, the Internet and the Web have been the subject of considerable attention as strategic technological tools able to increase the participation of citizens in democratic processes on the basis of the associated user-friendly interface and broad level of diffusion. However, we must be well aware of *alternative or complementary technology solutions* (already available on the market or still in the development process) that could potentially be used to strengthen e-democracy processes. In addition, the Web may not be the only useful technology supporting success in the development of citizens' participation and involvement, because of technological problems (electronic identification) or social issues (the digital divide, sharing of a common vision or project).

Secondly, flooring a debate on the subject of e-democracy means analyzing how to achieve radical change in established political models (forms of central and local government). From this perspective the role of the Internet should be considered as a breakthrough technology able to tangibly change political organizational forms of central and local bodies in terms of decision process dynamics.

Thirdly, we should analyze whether the presence of enabling technologies and of e-democracy processes at the central, and, more importantly, at the local level, are relevant *drivers for the transformation of the background of political actions*. When considering the European experiences of e-democracy cities are currently promoting and the related projects they are managing (see below), the impacts of such processes can be significant in terms of re-engineering of administrative procedures. Clearly, computer technology has significantly eased the way in which administrators reply to constituent inquires, which varies greatly from country to country. However, a further step has been taken on the road to implementing technologies with the goal of improving communications with constituents (Cavanaugh, 2000).

To sum up, the hypotheses that must be verified in order to promote an effective and efficient e-democracy process can be briefly described as follows:

- a) better distribution of resources among citizens;
- b) extending participation by involving all groups of citizens at the level considered (city, region, country);
- c) improving transparency of the e-democratic process (improving accessibility);
- d) ensuring the results of the participation process (in terms of opinions given by the local community and by individual citizens);
- e) institutional support within an open technological framework, able to sustain revised political models.

The use of electronic solutions to support and enhance the democratic process around Europe – both at the national and local level – is at the core of EU strategy as well as that of local authorities as a means to reduce the gap between citizens and government and for increasing the effectiveness of policies. On the one hand, initiatives promoted within cities and related to community and civic networks developed in the past twenty years are based on the idea of citizens' participation carried out electronically: these offered numerous opportunities for the experimentation of ICT on a local level. On the other hand, e-democracy can achieve its goals precisely by coupling the local and the national level in collaboration (and also the European level) to ensure the respect of citizens' rights and to reduce inequalities.

3. ALTERNATIVE APPROACHES TO E-DEMOCRACY: LEARNING FROM EXPERIENCE

European cities are showing significant vitality in the experimentation of e-democracy initiatives. The relevance of citizens' participation, in many

different forms, in urban life, is perceived as a primary goal for local administrations. The international conference held in Venice offers an invaluable opportunity to gather several of these projects promoted by cities around Europe with the aim of launching an initial phase of comparison. The e-democracy initiatives presented at the conference are Bologna and Parma (Italy), Gdansk (Poland), Ronneby (Sweden), and Tampere (Finland). The presentation and discussion of the case studies aims at providing an initial answer to the hypotheses described above, which should be able to provide suitable conditions to promote an effective e-democracy scenario. The main insights gleaned from an analysis of the different experiences are investigated in this section, while details of individual case studies are provided in the specific boxes.

3.1 From The Web To Smart Cards: How European Cities Promote e-Democracy

The case studies presented at the Conference reflect a range of alternative e-democracy strategies. Cities do not consider the Web as the primary technology to use to bring citizens into government processes. Instead, they emphasize the role of other technological devices as smart cards to develop an integrated approach to the participation of citizens in the many fields of the e-government framework

Moreover, most of the initiatives promoted by cities stress the social experience of citizens' participation and involvement as the fundamental bricks and mortar of the e-democracy building. While technology is at the basis of any e-democracy project, the ability to convince citizens to enter actively into the decision-making process on a systematic perspective is a crucial point. The social dimension of e-democracy is of key relevance if the relative goals are to be achieved. It is also possible to observe this intersection from the opposite angle. Technology becomes a "Trojan horse" that can be used to extend social inclusion and increase urban cohesion.

The Italian experience of Bologna stresses the positive impact for the city related to the shift from a 'broadcasting' approach to ICT (in which the municipality is the primary source of content) to an interactive use of electronic networks (bottom-up perspective in stimulating citizens' participation) (see box 1). The municipality of Bologna is well aware of the importance of considering the needs of all the players in the urban context. E-government should not be seen in the narrow perspective of the internal efficiency of public administrations. Instead, promoting e-democracy within cities is a fact of interaction and knowledge-sharing among administrations and citizens by developing the capacity of public authorities to listen to the voice of the community.

Hence, in the e-democracy framework, on the one hand administrations and policy makers must ensure transparency of the decision-making process by providing feedback to local communities. On the other hand, local communities must make a significant contribution to the design, planning and creation of contents to be shared on line.

Box 1 – From broadcasting to on line interaction: the case of Bologna¹

The issues discussed in the sections of this chapter have been addressed by the municipality of Bologna through projects and initiatives of a different kind. This serves to favor the transition from a representative democracy (chosen as the main form of governance) towards a more concrete form of direct democracy. There can be little doubt that the use of new technologies in governance can provide an opportunity to increase the quality of life, foster economic growth and help citizens in their daily life. Bologna is in the front line in Europe, being one of the most active municipalities engaged in the drive to implement solutions to achieve the goals outlined above.

The main aim of the municipality of Bologna is to promote and foster present on line e-democracy tools such as discussion *fora*, message routing, and newsgroups, in a simplified language to increase participation in the decision-making and consensus building process. A set of sub-goals has been defined to arrive at the concept of e-democracy. Through a range of different initiative the administration is attempting to improve technological e-democracy tools (new media, mobile telecommunications, etc), involve citizens and the services sector to set up on line communities. Other objectives include: natural language processing applied to Web resources and development of European projects concerning e-democracy.

Thus far this has been achieved through a series of activities:

- publishing, on the ‘Iperbole’ civic network, of documents together with abstracts and glossaries;
- CSS (Customer Satisfaction Service) for the municipal offices;
- self-managed virtual election sites (Digital Electoral Boards and Virtual Telematic Squares);
- on line discussion *fora* and guest-books;
- bridging of the digital divide by increasing free Internet access points.

¹Box based on the presentation of Ms. Leda Guidi, Iperbole/Internet Civic Network project manager, Information-Communication Department, Bologna City Administration, to the “On Line Citizenship” Conference. The video of the address by Ms. Leda Guidi to the Conference is available at http://it.sun.com/eventi/on_line_citizenship.

The municipality of Bologna worked on an EU project called DEMOS (Delphi Mediation On line System) concerning e-democracy applications, and is currently working on EDEN (Electronic Democracy European Network).

DEMOS

The purpose of DEMOS is to develop a new method of participation based on the approach of sociological resolution of conflict. The project is expected to help involve large numbers of citizens in the discussion of European (and local/regional) political topics. The project is planned to make a substantial breakthrough in on line consultation where currently no acceptable means exist to handle large scale discussion processes and deliberative opinion formation. The first prototype was tested in Bologna from 10 January to 20 February 2002. The chosen topic was transportation (private and public) in Bologna.

The results of the first user trial in Bologna are:

- 362 registered users and 713 messages posted;
- Large-scale participation in terms of the quality of contributions from citizens, with a large amount of innovative proposals on how to improve traffic flows in the city;
- Very low opinion scattering and lack of abusive language: general fairness from citizens;
- Very positive reaction from politicians: feedback from the deputy mayor and local councilors involved;
- Press article in “e-government” magazine about this trial.

From 3 to 25 February 2003 the second DEMOS prototype was tested in Bologna, exclusively among experts (associations, trade unions, cultural centers) and politicians (councilors, department heads, etc.).

The chosen topic was immigration: “Con-vivere la città” (“Living alongside in the city”). The most hotly debated topics, especially in terms of the number of messages posted, were: healthcare, the role of the school and the integration process. The result of the investigation led to the conclusion that possible causes for low participation in e-democracy initiatives, like on line moderated discussion, are:

1. incorrectly chosen topics;
2. no direct decision/outcome expected;
3. community either too large or too small;
4. no moderation or improperly conducted moderation (without fostering the formation of opinions);
5. incorrect invitation mechanisms (e.g. top-bottom mechanism when politicians are involved);
6. unsuitable use of invitation medium (e.g. only via e-mail);
7. unfriendly user interfaces.

EDEN

The EDEN project will contribute to supporting citizens' participation in the decision-making process, specifically in the area of urban planning, through the development of Natural Language Processing (NLP) tools to facilitate and increase the effectiveness of communication between citizens and public administrations. EDEN will address the issue of shifting from the prevailing paradigm of "broadcasting" (one-to-many information release) to the paradigm of "interactivity".

Within this debate, the possible modes of public-private management, if arranged in relation to a wider public interest, are to be taken in consideration and the following points must be carefully considered:

- Converging more subjects on the city and management targets
 - Involving resources, coupling different interests, missions and programs
 - Using the opportunities offered by new technologies to the full
 - Promoting and widening perception at a local level
 - Fostering a debate aimed at identifying new frontiers of innovation and socio-cultural invention.
-

As pointed out previously, an e-democracy scenario is based on transparency. In the Polish experience (see box 2, city of Gdansk) network technologies play a fundamental role in fostering the democratic process of the country. In this context, ICT increases the level of transparency of both political and administrative processes. The case of Gdansk is a successful example in Europe of how electronic networks can sustain and enhance the evolution of urban (regional and national) contexts by promoting the aggregation of communities around shared values and projects.

Box 2 - e-democracy in Gdansk: Together in Gdansk Again (TIGA)

Democracy is a relatively new experience in Eastern Europe, and was introduced in Poland only in the early '90s because of contingent geopolitical conditions².

Steps have since been taken to ensure greater and more active participation of citizens (enabled by new technologies in today's representative democracy as well as through more direct forms of involvement of citizens in addressing public challenges).

² Box based on the presentation of Mr. Wieslaw Patrzek, Representative of the Mayor of Gdansk for IT, Head of the IT/GIS Unit, to the "On Line Citizenship" Conference. The video of the address by Mr. Wieslaw Patrzek to the Conference is available at http://it.sun.com/eventi/on_line_citizenship.

The Government's effort to promote e-democracy is reflected in two separate acts concerning data protection and access to public files: the personal data protection act (Dz.U. 133.883 - 29.08.1997) and the access to public information act (Dz.U. 112.1198 - 8.10.2001). The aim was to increase transparency of both the government and interaction between the latter and civil society (breaking new ground in Polish legal history) to support activities against corruption in public administration and to favor obligations to secrecy (in the interest of an individual or the state).

During the presentation of this case, Mr. Patrzek underscored how the matters outlined above found a level of pragmatic expression in different initiatives, including the Bulletin of Public Information. Among other initiatives the municipality promoted activities of different kinds to combat corruption in the public administration: one example is the publication of statements of assets on the Internet for over 500 local administration employees in Gdansk (including 200 City Hall workers), giving clear information about their accounts, savings, credit positions, properties etc.

This decision involves all decision-makers rather than just politicians.

Part of the strategy to foster e-participation involved building a site comprising a section dedicated to facilitating the debate with politicians through *e-fora*, a section where complete information is published on all public tenders with the option of downloading documents, plus another site where questionnaires are used to address matters of vital importance for the city (e-consultation, e-surveys, e-panels, e-dialogue, e-petitioning, etc). Citizens are asked to participate in shaping the development of Gdansk, to make it a better place to live. An example of this is the attempt to improve the safety of the city through the participation of inhabitants in decisions taken in the drive to make Gdansk a safer place.

The municipality also launched a project to promote the idea of e-democracy more actively: TIGA (Together in Gdansk Again). This project – the finalist in the Stockholm Challenge Award 2002 (in the culture category) – aims at preserving the original historical and cultural environment of a specific region of Europe: the city of Gdansk. It is also an excellent example of how to unify the efforts of the local community and friends of the city around the globe in the process of returning to their roots (<http://roots.gdansk.pl>).

The city of Gdansk has been at the center of many historic events with an international profile during the previous century; it has been a melting pot of many nationalities, cultures and religions, which has engendered economic prosperity and growing importance among the port cities of that part of Europe. The main aim is the integration of the multinational community of people scattered all over the world (people who have ties with Gdansk) via the Internet to preserve the ties of the cultural and historical heritage of the

city itself and the Gdansk region as a whole. Discussion *fora* enable communication between users of the portal. This contributes to the preservation of the local cultural environment and the specific, multicultural and multinational climate in Gdansk. Anyone who wishes to become a citizen of Gdansk or whose roots can be traced back to Gdansk can enter their records there.

The publication of information on names and other historical information helps people to find their roots. The site is also useful in helping people in their search for friends, neighbors, school-mates, work colleagues, etc.

Another initiative conceived to foster the idea of e-democracy is called "Ring the new century". This was designed as a way to bring people together to greet the New Year by ringing the bells of the churches of Gdansk as the title of the project suggests. Citizen participation in this project was very high.

In the other Italian case of e-democracy presented at the conference (Parma, see box 3), the municipality promoted a concrete project of re-organization of the internal processes and procedures to increase the quality of interaction and reduce the level of bureaucracy.

The Parma experience is associated with the top-down approach to e-democracy. The electronic card offered to citizens is also the national card for accessing on line public services, provided by a public service center. From this perspective, the case stresses the relevance of promoting shared technology as well as unique organizational protocols and standards to reduce barriers and to support integration at the local and national (and European) levels. Large amounts of resources and considerable commitment are required to implement projects of this kind, which must be included in a broader institutional framework (central government). Smart cards represent a very valuable tool that can help citizens and administrations to interact in respect of specific objectives. However, there are limits. There are obvious risks and pitfalls related to either possible misuse or to external abuse. Considering these problems aids our understanding of the breadth and impact of such initiatives on one hand, and what municipal administration has yet to accomplish to make them effective tools to promote democracy, on the other.

Box 3 – Parma and the electronic card experiment

The main aim of the municipality of Parma is to build a new model of organization. The idea behind the project that of reducing bureaucracy and time wasting by citizens. This implies the will to maximize the availability of services and information both at a local and national level. In doing so, the municipality aims to reduce costs and improve the transparency of the

procedures currently used. Parma achieved results implementing a strategy that led to a complete re-engineering of the processes, a more consistent use of ICT and the deployment of innovative schemes of workers organization³.

This effort was mainly aimed at giving citizens more comprehensive access to documents and information directly from home, without having to rely on physical attendance at the administration's offices. A second goal, related to the first objective already illustrated, is that of stimulating direct interaction between citizens and professionals involved in the administration of the city in order to gather more precise information about citizens' satisfaction and obtain feedback for the improvement of practices and procedures. As said, all this relies on more extensive use of high technology. The idea is to deliver services (and the information linked to them) through a multi-channel infrastructure, in order to sweep aside barriers between citizens and the administration, fulfilling the citizens' requests in every moment and in every situation. As mentioned above, one of the imperatives is to reduce the cost of services. A number of initiatives have been promoted to achieve this. Splitting the organization into front-and back- office, integrating different platforms, OS, databases and applications used by all the departments or defining processes and procedures in greater detail are among the examples we could give.

The municipality of Parma participates in the electronic ID card experimentation proposed and sustained by the government. The card is designed in such a way as to hold personal data and information about the possessor. Supplied only to resident citizens, the electronic ID card can be used to access on line services provided by the city administration. A similar card (city card) was given to people who do not reside in the city and who do not need to access services constantly. The services to which the city card provides access are as follows: payment of municipal taxes and fines, auto-certification, download of the city technical map. Other services are currently under development. Payment of national taxes, on line educational and scholastic management and subscription services are just some examples.

The municipality of Parma has thus registered a successful experience in the realization of the electronic ID card project. ICT and democracy – as Mr. Castellani emphasized in a speech given during the Euro P.A. conference – are not naturally intertwined. The problem is that there is a concrete risk of excluding citizens who do not know how to use new technologies:

³ Box based on the presentation of Mr. Stefano Rusca, ITC Alderman Consultant, City of Parma, to the "On Line Citizenship" Conference. The video of the address by Mr. Stefano Rusca to the Conference is available at http://it.sun.com/eventi/on_line_citizenship.

developing and deploying a new structure to improve administrative processes and develop a new type of relationship with citizens is in itself insufficient. The real essence of democracy is the opportunity for every single citizen to enjoy direct relationships with the administration in order to fulfill their needs. The positive impact of the new technologies on the activities of city administrations is therefore represented by the powerful incentive towards internal reorganization. In this specific case, the effect to be hoped is a positive impact on the organization of the back office in a more effective and more responsive manner.

The creation of the municipality Web portal and the design and implementation of services and platforms saw the involvement and collaboration of a different range of players. A major role was played by the city administration through the center for citizen's services.

The portal (www.comune.parma.it) is developed around a fully multi-channel design, to be used by citizens in different situations and with different access devices. The services – some of which are delivered completely on line⁴ - offered on line are divided into two groups: information (mainly access to the administration's deeds, documents and reports) and interactive services.

Smart cards must be tamper-resistant devices that pose some questions of security linked to the cryptographic keys that they can generate and store. They can perform calculations and generate processes designed to produce credentials to be exchanged (between host and server) (Rubin, 2002). What are the limitations of this kind of device? The most important one is the lack of a deployed base of electronic card readers on PCs. Even if all citizens had such a reader connected to their personal computer, there would still be other security matters, not to mention the related issue of tampering with security and access codes (in electronic vote processes as well as in Internet-based transactions). These electronic systems can also be duplicated illegally. Another set of risks arises with respect to the potential for abuse of the supporting databases and communication complexes required to support electronic cards, together with problems of privacy infringement. In some contexts the card is publicized as a voluntary measure. If this is the case, some argue we could risk discriminatory treatment for non-card holders. We have noted that technological solutions entail risks; they have the potential to foster processes of democracy, but they deserve careful consideration and

⁴ Subscription to public schools and kindergartens, ISE certification, payment of fines and administrative penalties, payment of taxes, and automatic on line production of certificates.

must be identified and understood before they can be profitably deployed on a wider scale.

The outcome of projects like those presented in this work must therefore be able to solve the problems outlined above and also those linked to the proper structuring of both internal and external processes, procedures and organizational protocols. The risks could be significant, linked to a slowdown in various forms of interaction that could be activated on a public level. In particular, cooperation with citizens could otherwise be a source of value in terms of greater service quality, thanks to feedback received from local administrations.

Other technological tools could play a role in assisting administrations in overcoming these difficulties. Mobile phones for example could help to solve and overcome problems of security connected to the use of the network via PC. However, this could have the side effect of introducing even greater digital-divide issues (even though in many countries as in Italy mobile phones are more widespread among citizens than PCs).

Moreover, from a technological standpoint, emphasis must be placed on the development of a large variety of solutions (as in the case of Parma) able to support access to an electronic context of interaction that exploits the advantages of multi-channel technology (Web, SMS, local points of access, etc.). Administrations should balance the benefits of multiple access with the challenges of managing several different technologies (devices, standards, software, etc.), which is not an easy task.

The Swedish experience (Ronneby, see box 4) highlights the benefits that e-democracy can bring, as it reflects a deep belief in the process expressed by the administration. In 1993 the Swedish Parliament established literacy – as a fundamental right of the population – as one of its primary strategic goals, plus the diffusion of Information and Communication Technologies throughout the entire country. Network technologies not only increase the amount of information on politicians that citizens may have access to, they also improve the participation of citizens in the elections (active participation in the electoral process). As a case history, Ronneby deserves careful analysis. In fact, it does show how powerful ICT tools can be. It does give proof of how their use can benefit society, from both perspective of both administrators and citizens. We see modern public servants as having at their disposal a series of means able to help them to deliver a better service while simultaneously able to strengthen their position in relation to a series of other parties, including politicians. New Information and Communication Technologies make them more readily aware of the real world of the electorate. At the same time, politicians can rely more than ever before on feedback received and on their expertise, while bureaucratic structures can benefit from these contacts through the development of technological

solutions (Jackson, 2003). Effectiveness and efficiency must be achieved as complementary aspects of the democratic process. The interaction between the various parties is vital. Citizens experience the possibility of assuming a more active role and enjoying greater awareness in the decision-making process. On the other hand, learning how people live, talk, think, and work is crucial for anyone concerned with the revival of formal democracy (public authorities).

Box 4 - RONNEBY OPEN 24– Sweden⁵

Ronneby city council has been a partner of Telecities since 1995. The city of Ronneby has long experience of using ICT for democratic purposes. Sölve Landén (information manager of Ronneby) has headed a number of projects with such ambitions. The city has recently carried out two net-based efforts to support local debate and dialogue. The aim is to make e-democracy more tangible, defining new ways of bringing democracy closer to people and a process through which everyone involved can participate in a more direct manner.

One of the projects aimed at stimulating the involvement of citizens in local politics, especially before the election of the local parliament last September. The second project developed during the year 2003. The objective of the municipality is to promote appropriate levels of communication between the administration and citizens when creating a long-term development plan for the city and its surroundings. The resulting dialogue is expected to improve the quality of the basic data, subsequently assisting the forthcoming decision-making of the local parliament. Blekinge Technical Institute is another partner of the project, which is partly funded by the EC.

Several years ago the administration adopted the motto “Bridge the gap! Engage the citizen!”. Certainly the presence of Soft Center (a science park for IT and telecom companies) and of a rising IT specialized university in the same park has helped to develop the required mindset, directing efforts and shaping policies in a more suitable manner. During recent years in fact the administration set specific priorities on which to work. These can be concisely expressed by the following three key concepts: availability (pursued by extending the optic fiber network, modernizing libraries, investing in schools, promoting private investment), competence (which implies designing strategies and implementing them through initiatives of

⁵ Box based on the presentation of Mr. Sölve Landén, Information Manager, Ronneby Municipality, to the “On Line Citizenship” Conference. The video of the address by Mr. Sölve Landén to the Conference is available at http://it.sun.com/eventi/on_line_citizenship.

different kind: training of pupils, citizens and employees - projects like 'New ways of learning'- IT workshops and IT fairs) and democracy.

The presentation given by speaker Sölve Landén at the conference provided a comprehensive overview of the kind of activities carried out by Ronneby municipality and currently still underway to encourage the spread of e-democracy. There are two main initiatives that could be considered in the present context:

- the "Election 2002" project;
- the "Citizens' Comments" project.

The aim is that of testing new forms of information, questions, and debate and to encourage involvement and stimulate interest in local politics.

Election 2002 was the brainchild of the city council. The preliminary work was carried out during the spring and summer of 2002.

The objective was to build a Website focusing on the forthcoming elections to support knowledge and stimulate debate between citizens and politicians. Planning and preparation were important; meetings with students, politicians and focus groups, and interviews of citizens were all means designed to give the municipality knowledge about how to achieve the matters on the agenda. The involvement of a private partner was needed for the actual Website design stage. An agreement was entered into with YourVoice – a software company – based on the desire to build a site able to satisfy specific needs and answer questions such as: "How can we enable dialogue?" or "How can we administer it?".

With the aid of the Website <http://val2002.ronneby.se> the inhabitants of Ronneby could thus glean information about the political situation in the municipality, where to vote, etc. Some of the information provided was translated into several languages. As stated in the pdf file illustrating the project, in accordance with decisions taken on a political level, all parties with candidates for the municipal Council must be treated equally on the Website. This led to the inclusion of links to the Websites of nine political parties, including the extreme right-wing executive (the Swedish Democrat Party). All candidates were invited to publish information about themselves and to provide a photograph if they so desired. Many candidates took advantage of the opportunity. The project and the Website attracted considerable interest from the media, particularly during the initial weeks.

Many questioned the wisdom of providing a link to the Swedish Democrat Party's Web pages. The political majority in Ronneby were, however, of the opinion that the links should be allowed to remain. The project group also produced a brochure about the election. This was sent out to all households by the municipal authority. Much importance was attached to producing printed material and a Website that were to be easy to read and understand.

The Website was well received. People expressed satisfaction that a debate had been started and that it was Ronneby Municipal Authority that had taken the initiative. The project did not result, however, in an increase in the number of people casting their vote. The number that voted in Ronneby was much the same as in the rest of the Country. In this respect it seems logical to assume that repeated campaigns of different kinds are probably required to increase interest in municipal democracy. The question panel of YourVoice's Open 24 system will probably be used also in the future. The same applies to the idea of public debates over the net. The information manager has been given the task of suggesting how the idea can be developed without specifically linking it to an election. It is a question of making the best use of the lesson learned from the project. Many questions and requests have been received through the Website. Many of these were aired in the in the debating panel before the election; most suggestions and requests, however, materialized in the weeks immediately after the elections. By that stage the Website had been redesigned in order to illustrate the election results and encourage people to express their opinion about the project and e-democracy as a whole.

When the project was finalized, the speaker informed the conference that approximately 30 people answered an invitation to express their opinions about the initiative. The majority were in favor of the project and anxious to ensure that the municipal authority should continue the process. Personal interviews with politicians and individual members of the community were also included in the evaluation. A number of interesting points of view on e-democracy were received, many of which could be useful in the future both in Ronneby itself and in other cities in Sweden or perhaps abroad.

The second project presented by Mr. Landén and run by the municipality of Ronneby was "Citizens' comments" as mentioned earlier. Here, citizens are invited to express their opinions on how to administrate, design and promote the city and its management. The site is to be designed in accordance with principles of the maximum user-friendliness (both in relation to citizens and municipal employees). The important thing in this context is to define how to handle the contributions and requirements of users and how to implement the actions to which a commitment has been made. This second project is still in its early stages of development and much work remains to be done.

The Finnish project developed in Tampere ("Participation Palette") (see box 5) is another interesting way of promoting the participation of citizens in the political life of cities through the use of ICT. By extending the points of access to the Internet and exploiting the advantages of multimedia, the Municipality aims to increase the offering of on line services and extend

them to a wider group of citizens as well as promoting participation in the decision-making process in respect of key urban issues (e.g. road traffic flows). Many citizens would most likely take advantage of Web services to conduct business and pay minor fees, obtain tickets, download government documents or exchange useful information. In this way citizens acquire the right to become “legislators” relative to issues of importance to them concerning agendas, priorities, planning and policies (Becker, 2001). However, an increase in the accessibility of citizens and their level of participation is required in order to develop the effectiveness of representative systems.

Box 5 - e-democracy in Tampere – Finland⁶

The municipality ran a program called eTampere, a five-year development project involving an investment of 130 million Euro. The general objective was to make Tampere a global leader in the research, development and application of issues related to the information society. The program focuses on three themes. Public on line services will be developed and made available to all residents. The knowledge base for research and training will be strengthened, and new business related to the information society will be generated. The eTampere program is intimately linked to the business strategy of the Tampere urban region and the provincial development strategy. The program will be carried forward in close cooperation with the Tampere expertise program regional center.

A sub-project was designed specifically to address and develop e-Democracy solutions: Infocity. This project aims to make Tampere a model city in the development process towards an information society. This goal will be achieved by developing practical on line services for citizens and by ensuring that all citizens also have the opportunity to use them. At its core, Infocity is a project for developing Web services in the city of Tampere. It is also an open cooperation project for public administration, the services sector and private parties. Cooperation takes place in Tampere, regionally, nationally and internationally.

A site has been designed to give information about the implementation of the project and the initiatives that the administration is trying to implement. The site is subdivided into different sections to aid intelligibility for visitors. The sections are: mission, background information, sub-projects and e-cards.

⁶ Box based on the presentation of Mr. Päivi Kuusisto, Editor in Chief Internet Services, City of Tampere, to the “On line Citizenship” Conference. The video of the address by Mr. Päivi Kuusisto to the Conference is available at http://it.sun.com/eventi/on_line_citizenship.

In the information society it is important to ensure that every citizen has access to public services. Digital literacy prevents exclusion from the information society. The opportunities of digital participation should be available to all. Infocity brings digital services closer to citizens. The bulk of the material on the Website is still of a purely informative nature, but the potential for participation opportunities, interactive services and formal correspondence with local authorities is increasing. The principal target group of the services comprises the resident population of Tampere - some 200,000 in number. An extensive range of ordinary services provided by local authorities are already available on the Internet. Two out of three of all Finnish people have used the Internet. In Tampere, 73 % of citizens use the Internet at least sometimes. When asked about their usage patterns, most users mention entertainment, e-mail, 'what's on' information and banking services. Some already use the Internet for shopping or political participation. In a user survey conducted among the visitors to the Website of the city of Tampere, the principal reasons for entering the site were to communicate with the authorities and to obtain services. In addition to free access for schools, the city of Tampere offers free Internet connection to the public at more than one hundred and forty terminals in libraries, hospitals, sports centers and several municipal offices. The local authorities also run a cyber cafe. There are connections available for senior citizens at day centers and community centers, and in the suburb of Hervanta an EU funded project is running a project to fight social exclusion with the help of Internet skills and opportunities. A service point for the visually disabled was opened in 2002. Initial training in computer and Internet use is available to citizens ranging from kindergarten children to senior citizens, at schools, adult education centers, libraries, clubs and other NGO networks. All Tampere schools are on line, with each pupil having their own e-mail address and the facility to use the Internet at school. The Internet education of the inhabitants of Tampere will be even further intensified during the eTampere program.

The Infocity Program implements its different functions by improving services of the information technology center of the city, by increasing the number of personnel producing Internet content by leveraging and enhancing the Internet skills of municipal staff, and by acquiring databases, publications and other programs in order to provide services on line. Many projects are conducted in cooperation with public and private partners.

Key projects to be implemented within Infocity are as follows: electronic identification for official business, on line democracy, e-learning, access points and computer and Internet skills.

More in detail, we could say that Tampere - as well as other municipalities - are seeking a solution to the problem of electronic identification. The goal of the eTampere city card project is to develop a

card that combines several smart card technologies and applications. The card will offer both private and public sector services for citizens. In addition to generating digital services, it is important to focus on the level of availability and the skills of citizens in using them. The Internet education of the inhabitants of Tampere will be intensified during the eTampere program. There is already a wide range of courses available provided by the local authorities, church parishes, NGOs and private businesses. One initiative on which the administration is working is the e-Card project (part of the eTampere program as an Infocity module). The aim of the eTampere city card project is to develop a multi-application, dual interface smart card system that provides a key to information society services. The project is coordinated by Access International Consulting Oy Ltd. VTT (the Finnish technical research center) is providing additional technical consultancy support. The pilot project was started at the beginning of 2003 for local students and the smart card will be gradually offered to all citizens. The distribution goal for the city card is 100 000 units or 50% of the city's population. The possible applications are numerous. The e-card could be used as a travel card, an e-purse, or to obtain PKI certificates. It could also be used access libraries, for access control, as an e-ticketing tool or as a city bonus.

The various e-democracy initiatives promoted by local municipalities highlight the relevance of an innovative approach to electronic technologies by exploiting not only their efficiency in information management (i.e. databases) but also, and more importantly, their significant potential for interaction. The Web is no more than an initial easy-to-use technology that must be coupled with other technological devices in order to increase the opportunities of citizens to participate in decisions covering a wide range of topics, no matter where they are. In addition, the technological aspects of e-democracy projects bring with them also organizational issues especially concerning public administration processes. As highlighted by the Bologna and the Parma experiences, the reorganization of internal procedures is a first important step in the move towards e-democracy, but it must be coupled with a learning process concerning how to communicate and interact with communities by using their languages and practices (see also chapter 3).

Above all, e-democracy should be considered as being at the top of e-government initiatives. It should also be promoted by taking into account synergies with all government procedures and actions in order to achieve a more cogent and integrated use of technologies and, in so doing, to better manage relationships between citizens and administrations.

4. OPPORTUNITIES AND THREATS RELATED TO THE ELECTRONIC DEMOCRACY

Hitherto the presence on the Internet of European Public Administrations has mostly been focused on Websites. Public Administrations' Websites have generated a huge quantity of differentiated and non-integrated e-content, and a small number of interactive ICT applications/services (see also chapter 5). The prevailing model is based on "broadcasting": even today interactivity continues to play only a marginal role. As already stated, today a significant proportion of e-government is focused on elections. Frequently the attention of governments on line is limited to polling and voting. If, on the one hand, such a perspective is no longer sufficient as the e-government framework becomes more complex, on the other hand however, interesting and potentially useful input for the management of e-government projects can be found by starting from the opportunities and problems of e-democracy.

The efficient, cost-effective and validated provision of services is above all an organizational issue. But e-governance is also a political, cultural, and social issue. The key concepts are interaction, sharing of knowledge and contents, developed through the real participation of citizens. Public administrations should therefore focus on the needs and expectations of all the players involved in civic life at all levels in the decision-making processes so that they can manage, directly, and in a shared and negotiated manner, the potential conflicts that would have far greater financial, political, and social costs if managed after the relative decisions have been taken.

The potential of the Internet in building a shared on line environment must be strengthened, specifically by empowering on line citizenship. As the different experiences of e-democracy presented show, the Internet and more generally the electronic space of interaction assume a decisive role as a source of value for democratic processes. Cities are promoting the idea of building and sharing a new social agreement based on the digital experience and infrastructure at a European level, where e-citizens are provided with real guarantees in terms of the principles of equality of rights, duties and opportunities.

The speaker at the conference in Venice reminds us that electronic democracy is to be considered as the participation of citizens in the entire decision-making process under their own validation and control. This approach is still in its infancy, although partial steps have been and are being taken in this direction as a useful testing ground for further implementation of more complex processes.

In conclusion, the strategic impacts of an e-democracy approach within governments and specifically at the urban level are multiple. In the e-democracy scenario, decision-makers can exploit interactive tools to improve *discussion and comparisons* among opinions before the decision is taken or the vote is cast, and hence they can increase the efficiency and quality of decision-making processes.

Moreover, e-democracy requires a profound *reorganization* of administrative and political processes while also improving the transparency and reliability of administrative procedures, decision-making processes and political actions in terms of steps and results. In this context the key role of central governments and local authorities in the promotion of e-democracy as an absolutely essential public and collective goal becomes starkly evident.

Another impact concerns the social sphere of cities, since e-democracy stimulates the development of a *sense of community*, wherein technology for e-democracy makes it possible to create or strengthen the process of construction of local communities. In this regard an important issue concerns the level and the degree of moderation that may be applied in the management of e-democracy processes (level of control, problems of discrimination, etc.). In the first experiences of community networks spontaneous social dynamics benefited from the leading role of moderators or community-managers, able to increase community advantages in terms of knowledge sharing and organization of interactive flows. In e-democracy initiatives a role of this nature is specifically important in order to ensure transparency and equality in accessing the on line environment and decision-making process.

To sum up, based on the experiences of e-democracy projects conducted in European cities, the necessary conditions to be able to support an effective and efficient e-democracy process refer to both the technological and political (institutional) domain.

1. Considering the alternative approaches adopted by different European countries – i.e. the electronic card vs. PIN solutions – a process of convergence has started concerning the need to ensure *easy accessibility* to the electronic environment and its features, as a pre-requisite for successful e-democracy processes.

2. Citizens are not only assured by the fact that they are granted easy and open access to the tools of e-democracy, they must also be reassured on the matter of *safeguards protecting of the opinions and ideas* they communicate in the on line environment. This issue is closely linked to the question of privacy, i.e. the fact that all the information provided by citizens must be kept and managed safely (in order to prevent potential improper use by other parties).

3. The *re-organization of the political and administrative processes* is a key step in the success of e-democracy. Government bodies – and specifically municipalities – should effectively undergo a transformation in accordance with a bottom-up approach to the decision-making process as well as in the way that the efforts of citizens are genuinely taken into account in decision-making and management activities.

4. It is necessary to promote *real interaction* between citizens and government, where knowledge sharing and distributed information sources are coupled to a real capability of administrations to dialogue with local communities.

5. E-democracy is based on a *learning process* wherein government authorities acquire new knowledge about the needs and desires of citizens as an important first step in the drive to satisfy the requirements of all the interest groups involved.

6. As demonstrated by the Polish trial, the e-democracy approach is extremely useful in order to *promote and share the values of democracy* by exploiting network technologies.

7. Projects based on e-democracy developed within an urban context stress the *role of on line services as civic services* rather than services of a commercial nature. As Cavanaugh points out (2000), we must avoid the development of a technology-based democratic environment as a way to reconnect the citizenship and the government, built on an oversimplified view of citizens as customers of on line services. The e-democracy approach should be focused on promoting experimentation concerning the use of technology for the provision of services and citizens' participation within an institutional framework and not for profit, where citizens become the co-designers of on line services (see also chapter 5).

Chapter 5

WEB SERVICE PORTALS: TRANSFORMING LOCAL ADMINISTRATIONS THROUGH ENABLING TECHNOLOGIES

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1. WEB SERVICE PORTALS: THE NEW IDENTITY OF E-GOVERNMENT AND E-DEMOCRACY IN MODERN CITIES

As repeatedly stressed in the previous chapters, the goals of e-government are linked to the need to establish a new type of relationship between citizens and public administrations. This end is pursued by focusing resources on the following issues: increasing efficiency, active participation and democracy; offering better service to people; increasing awareness of responsibility of both citizens and public administrations, and also freeing management from specific activities and aiding its arrival at a global view of public services and a more rational definition of public workflows. Indeed, the goal is not only to provide citizens, economic organizations, companies and institutions with a range of excellent and effective services, but also to create a new form of citizenship based on the participation of all individuals in the provision of services and the decision-making process thanks to the intensive use of new Information and Communication Technologies (ICT).

Web service portals can constitute a useful means of offering the services needed by all users, both current and future. At the same time, they embody a new opportunity for the deployment of ICT after the disappointing results of the new economy and the unfulfilled promise of a revolution in business and economic activities. Today, electronic networks can become “enabling

technologies supporting improvements in business and a more pervasive transformation of economic and social activities” (Porter, 2001).

That’s why e-government constitutes a chance for new technology to improve the quality of life of city dwellers and participate more proactively in the governance of the city in which they live.

Web service portals are based on a relatively complex set of technological devices (see § 5) organized in such a way as to provide a simple and friendly interface for end consumers/users. Public organizations offer assistance to citizens and businesses by presenting the full range of available services in the context of a Web portal. These services are effectively provided through the networked collaboration of a large number of public and private organizations retrieving any information of use in the provision of services to citizens from their specific databases (see chapter 3). To sum up, users can search for the service they need in a simple Web portal and obtain it with a simple click.

This means that Web service portals can constitute a valuable tool for the improvement of the potential of public information and transparency towards citizens and businesses and also the participation of end users in local government issues and the design of services. In this context, the Internet can be used by citizens to keep track of their governing bodies, rather than by governments to keep track of citizens (Castells, 2000).

Nevertheless, it is essential to enable not only communication and collaboration between different public administrations from a central to a local level, but also communication with the demand side for matters related to the creation of services. As asserted by European Commission member and Enterprise and Information manager Erkki Liikanen during the e-government 2003 conference held in Cernobbio in Italy, the public sector should provide all-inclusive services because governments cannot choose their clients: they have to serve the entire population and listen to their needs.

In the framework of the knowledge-based information society a large number of changes from a social, economic, and political standpoint have occurred throughout the world and in Europe in particular. The traditional model of central state has been weakened, while the local dimension is becoming fundamental for economic development and social growth. In addition, cities are slowly becoming a strategic locus for this development and for the growth of local identity.

Cities have always played a key role in the arena of government, but that role is more important today, as their position is defined as a hub of aggregation and participation in local government and development through vertical and also horizontal networks (Perulli, 2000). Cities can play a new role in the accomplishment of self-government and can offer a means for far

wider local participation in order to share a major resource that is absolutely indispensable in a knowledge-based society: social awareness (Di Corinto, 1998).

In an innovative e-government strategy, cities and the participation of citizens and business regain a central role. In addition, experience, knowledge and the communication and greater focus on the nature of needs are an indispensable and an enabling factor for local growth and enhancement of the quality of life. This evolutionary process is unfolding gradually. In the 2003 report on the annual e-Government research "Leadership: Realizing the Vision", Accenture identified the tendency all over the world to treat citizens and businesses in a similar manner and to introduce customer relationship management techniques to the delivery of government services. In this context, a research study by The Economist (Economist Intelligence Unit, 2003) found that "e-transformation has become the silent revolution".

Moreover, cities and municipalities can also play a crucial role in technological development through the offering and implementation of interactive and user-friendly on line services for the local community and for others who use cities, through the promotion of technological initiatives at a local level that aggregate the parties involved around a common project with a long-term vision¹. Those involved in community planning are interested in achieving, within their closer environment, an effective method of generating wide participation, common understanding, and approval to spread the socio-economic benefits of involving stakeholders through the whole process of government.

City governors need to gain an understanding of the massive changes caused by technological developments in terms of new methods of communication and information sharing, necessary for the creation of a new language for a new world. In addition to the economy, these changes touch on society, communication, politics, and also the very meaning of citizenship. It is impossible to sharpen public interest in the democratic debate or implement on line services and participation without a substantial increase in the level of competence and organization of government. It has therefore frequently been necessary to reshape processes to accommodate new goals and methods through the use of IT applications.

¹ See the full text of the talk by Stefano Visalli, senior partner, McKinsey Europe, presented during the "On Line Citizenship" Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

2. WEB SERVICES: THE “NEW IT STRATEGY”

In the opinion of many authors, Information and Communication Technology can generate useful solutions to improve efficiency and effectiveness of the Public Administration (PA) in relation to citizens/businesses and local stakeholders and can also function as a driver promoting local technological development.

A “new frontier” has recently been identified in the management of IT resources utilized to obtain services over the Web. The “new IT strategy” consists in purchasing and sharing information technology from broad-based service providers, rather than owning and maintaining proprietary hardware and software. Web service architecture is open and developed on the Internet so that, instead of creating and maintaining stand-alone internal systems, companies can lease the functions they need from external service providers.

These tools provide a common language for Web services, enabling different applications to be freely interconnected (Hagel and Brown, 2002).

These standards can greatly simplify and streamline information management: with Web services architecture, the process of information provision becomes far more flexible, automated, and efficient. It can assume a modular approach using specialized Web services supplied by an array of providers.

This strategy can probably offer much far more benefits than traditional IT architecture, which is based on the opportunities provided by internal systems. It can provide significant cost savings that will lead to immediate efficiency gains because it is an efficient method of managing information technology. And the technology is able to incorporate new capabilities because, as the infrastructure becomes more robust and stable, it can offer new opportunities for collaboration among companies, stimulating adoption and hence sharing of the same standards for data description, applications, and connection protocols (Hagel and Armstrong, 1997).

In addition to technology, providers have made large-scale investments in the offering of a range Internet-based on line services that display significant cost savings when compared to traditional internal systems, not to mention higher quality of the services in question. This strategy can allow companies to focus on opportunities that will bring immediate efficiency gains and allow new capabilities to be incorporated, substantially benefiting companies as a whole.

According to Hagel and Brown (2002), Web services architecture should be initially viewed as an adjunct of current systems through a process known as “node enablement”, which is systematic and driven by near-term needs although shaped by a view of longer-term opportunities. In implementing the new architecture, adopters are in general concentrating their initial efforts on

the “edges of their enterprises” i.e. on the applications and activities that bind their companies to customers or to other companies, but also several traditionally internal functions can be pushed outside the boundaries of the company as a result of outsourcing techniques (Hagel and Brown, 2001).

Hagel and Brown claim that the greatest advantages available thanks to Web service architecture are likely to be the openness and modularity of the services in question. Unfortunately, managers have recently displayed a certain skepticism in relation to the perceived benefits of new technology because of the negative experiences of the end of the ‘90s, when vendors of Internet applications and platforms were proclaiming the imminent arrival of major benefits and incomes for enterprises although the results of the consequent major investments either failed to materialize or were far more modest than anticipated. So, in the view of many experts, the sacrifice in terms of financial resources, flexibility and opportunities, has led to disadvantages in modern markets. The solution proposed by John Hagel is to “deliver more value with fewer resources in Web Portals characterized as “the new generation of technology”.

Web Portals are interesting and, at least theoretically, highly profitable because, as already noted, they make it possible to achieve major savings in operating through connection with existing IT platforms using methods that are more automated and flexible. Web services can provide a valuable source of assistance for businesses: to obtain bottom line savings with relatively modest investments, to make leverage investments in existing applications, to create greater flexibility, to identify target areas that can help to reduce short-term costs, to set up or re-design business relationships more easily and at lower cost, and finally, to create platforms of growth and support of long term competitiveness.

It follows that Web services can constitute a useful tool not only for private companies but also for other sectors such as public administration through the implementation of e-government. In particular, Web services are functional and can deliver significant benefits on a local level for cities and their inhabitants through the Web Portals of local administrations. Web services offered by municipal portals can deliver all the economic benefits mentioned and, apart from stimulating user participation, they can generate a series of benefits connected to collaboration between different partners and stakeholders.

3. WEB SERVICE PORTALS: A CLASSIFICATION OF SERVICES, USERS, GOALS AND RESULTS

In the opinion of many experts, e-government initiatives and the use of Web networks in the urban context are linked to the evolution of e-cities (see A.I.Re.C., 2001) in a process composed of two distinct stages.

The first stage started in the early '90s and was characterized by the use of technology as a means to empower spontaneous interaction between citizens (civic networks). These were bottom-up type initiatives wherein the contribution of citizens assumed a central role while the role of the public administration was to ensure the participation of citizens and guarantee democratic and pluralistic contents.

The second phase of the process is still underway, and it is primarily directed and regulated by institutional parties such as central and local public administration authorities whose objectives are to guarantee the offering of high quality, efficient and effective for citizens, business and the wider local environment using technological means to foster integration. These projects are essentially top-down in nature and they are centered on the problem of satisfying the different needs of local citizens (Micelli, 2001).

Today, digital cities offer a wide range of e-government services to their citizens and users. As many experts have highlighted, the implementation of a valid assortment of on line services requires the fulfillment of at least two starting conditions: users must understand the security level of the service and the services must be really useful, i.e. they must be able to generate value for users through new electronic channels (Hagel and Brown, 2002).

There are two different kinds of services that can be supplied to citizens through Web Portals: horizontal services and vertical services. *Horizontal services* are addressed to generic users and offer generic and broad-referenced content, while *vertical services* provide more specific content related to a clearly defined area of interest.

The analysis of numerous examples of different citizen services provided by many European city administrations through Web services shows that they are constructed and implemented through collaboration with technological providers, but also by exploiting collaboration with other institutions, such as law enforcement agencies or private institutions such as banks.

Other examples of Web services designed for citizens, professionals and companies that are contained in the pages of official Websites of the city, appear to be innovative and useful. These include, for example, the facility to take part, with live contributions, in city council meetings transmitted live by Webcast (in application of techniques referred to, in some contexts, as "city government session information systems"); access to registries of city

government documents; information systems for financial management; information systems concerning social issues; land and property registry office deeds and geographical information systems; information system for regional territory, economy and the environment; expressly business-oriented services; the use of digital signatures and electronic identity cards or other specific citizens' electronic service cards.

Recently, some cities (such as Siena) are following the path of implementation of interactive services on a wide scale to allow citizens to use services offered through the use of widely available devices such as TV-sets and computers. The use of television allows a wider section of the community to access interactive services such as real-time information, e-commerce, home banking, the transmission of information of relevance to specific communities, healthcare services, and so forth.

In addition, most of cities have plans linked to renewed development of e-services. In particular, many digital cities aim to increase the number of e-services available for citizens and the number of users of such services, increasing also the number of ID-card holders so as to be able to improve services as a result of the scale economies deriving from the larger user group. They also aim to reconsider existing business processes and procedures so as to organize services and business in a more flexible manner, thereby generating time savings for citizens, etc.

With regard to targets and users, these can vary widely from generic to highly specialized. This means that the services can be addressed to the broader public, i.e. unidentified users visiting the site, who could be local citizens or business, tourists, foreign organizations, and so forth, or they can be addressed exclusively to specialized users such as professionals or other users (net surfers) who have registered with specific services in order to exploit the benefits made possible by personalization of the service in question.

There are also services addressed specifically to public partners such as schools, universities, urban communities, or to private partners (primarily suppliers). Finally, there may be specific services designed exclusively for an internal user group made up of those connected on an intranet, who need access to a range of highly specialized services the exact nature of which will depend on their specific role within the administration.

Public services can be provided through different channels: intranets, the Internet, and extranets. According to several experts taking part in the conference, different channels are interwoven with the different users of services and respective functions. Web services are usually the result of lengthy experience in the use of these technologies, of a process of evolution and growth in the offering of services to a large number of citizens, as is the

case, for example, in Rome or Barcelona, where integrated databases have been created starting from call centers.

The goals of these projects and investments are not to create a technical project, but to create a *project of progressive evolution of the concept of citizenship* in such a way as to improve the quality of life of citizens and raise awareness of the new opportunities on offer and the possible results that can be obtained. Like all e-government projects, the final objective is to achieve an increase in the level of effectiveness of the administration, to foster active participation in the democratic process, to improve the quality of service, to facilitate decisions in terms of the installation of services, and to enhance the general image of the city in an indirect manner. Projects of this type can have several radical impacts on the life of users, especially because of the large-scale use of emerging technology.

In many cases, technology can have long-term consequences on the cultural identity of citizens and on the global position of the cities involved, on the quality of life of citizens, on infrastructure and assets, on the budgeting and accounting practices and overall transparency and accountability of public administration, on the management of communications and information flows, and also on competitiveness, regional development and investment, the collection and analysis of revenues, and, last but not least, on the representation and participation of citizens.

Thus, in order to accomplish integrated development of the local environment through Web services, certain attendant conditions must be fulfilled: an increase in the mobility of citizens, reduced budget costs for operation demands, higher levels of security in each network-based transaction, reduced times for the provision of services, pressure to increase the quality of service delivered to citizens, to increase administrative efficiency, and to adopt “invisible” infrastructure.

With regard to the observed results of such initiatives and investments, some citizens have noticed a higher level of transparency in the actions of the public administration, especially in terms of workflow monitoring and feedback. Stimulating the use of these services has enabled increasingly significant cost reductions for transactions and a progressive lowering of the digital divide. Moreover, since these services are the consequence of a certain amount of re-organization and re-engineering within the public administration structure, it is frequently possible to observe increasing improvements in the internal public organization, workflows, and, ultimately, in the overall management of cities.

4. MODULARITY, PARTNERSHIPS AND IMPLEMENTATION PROBLEMS

As noted above, the central idea of Web service portals is linked to evolution of the offer of services in terms of modularity.

Today, citizens appear to be far more aware of their requirements and needs, while modern city life is becoming increasingly complex and chaotic so that citizens need more comprehensive and straightforward services to be combined in relation to their personal needs.

The idea of modularity of services is related to the complexity, difference and heterogeneity of the needs of each citizen. The solution lies in being able to offer a broad range of different horizontal and vertical services from which citizens can select and subsequently use their personalized package of services to meet their own needs. The Web and Web service portals can constitute a robust platform, a valuable support, and a showcase to display the service opportunities and offer them to citizens.

Initiatives linked to Web service portals have been set up and managed thanks to several partnerships of a technological nature between city governors, software houses and hardware manufacturers, and also other providers of the equipment needed to implement these projects and to offer complex services to their final customers: citizens and businesses.

The aims of technological partners are generally to deliver productivity and value-added applications and to develop and motivate e-government practices by improving services, efficiency and effectiveness and hence the overall level of competitiveness.

As for every generic business and Web service, building a Web services portal can constitute an excellent opportunity to attract new professional figures and also investments, people and ideas and to profit from the exchanges of different ideas, points of view, capabilities and skills. Indeed, redrawing the boundaries of cities as a consequence of the creation of service portals can represent a good opportunity to increase participation in and access to local government, to enhance the development and growth of local society, or to attract local or foreign businesses, new residents, tourists, and other potential new city stakeholders.

A city portal constitutes an infrastructure resource for active cooperation among different departments of the public administration and among various different stakeholders. It can offer a coherent point of access for on line interaction with public authorities and simplify relations between citizens, professionals, companies and the city councils. It may be enormously beneficial to define a national network of services able to link together different local infrastructure and promote solutions of re-use in various

different public areas that could benefit from a higher level of coordination, integration, and uniformity of standards and solutions (see chapter 3).

The modularization of public services thanks to technological development, plus the experiences, partnerships and opportunities offered by Web portals generates a range of different problems of both a technological and economic nature.

Technological problems are related to the achievement of the best possible use of ICT tools, dealing with the need for high capacity infrastructure, to build an appropriate and effective Web service portal. In contrast, the economic problem is related to the need to monitor and predict, in terms of the necessary monetary and temporal resources, each individual service to be offered by the public administration on the Web.

A further problem relates to the management of services of this type: which are the best types of projects and procedures to select and follow in order to obtain the best economic results? Many experts on e-government policies and projects claim that in this phase of evolution of Web portals and e-government it is critically important to disseminate the services in the largest possible number of cities and local environments. In effect, public administrations should invest in the diffusion of a large number of “average practices” rather than a small number of best practices (see chapter 3). In this context, account should be taken of the objective importance of sharing knowledge and solutions in such a way as to create a platform of services of use for citizens and businesses throughout a wide network of public administrations, which collaborate among themselves and with their users.

5. TECHNOLOGICAL DEVICES

To aid understanding of Web service portals, it may be useful to discuss their organization from a technological point of view.

In general Web portals use multi-layer software architecture (“n-tier”) wherein each tier or layer must be as far as possible isolated and independent from its neighbors in such a way as to assure the necessary degree of independence.

This kind of solution features an end user connection framework designated ‘presentation layer’, whose task is to cover the overall data processing system and its implementation through the use of a standard interface that is suitable for the specific application and sufficiently user-friendly. The level of accessibility implemented allows all citizens to use the portal with no discrimination in relation to their specific level of skill, thanks to the adoption of standards such as, for example, W3C, and the use of

multi-channel tools such as SMS, e-mail and WAP, which are familiar to citizens and companies.

This idea and these criteria, which are adopted in order to promote and increase practical and effective access to the services, are described in detail also in a circular published by AIPA (*Agenzia per l'Informatica nella Pubblica Amministrazione* – the Italian agency for computing in public administration), and municipal authorities can gain certification attesting to the observance of these criteria in their applications. The Venice city portal, for example (box 6), possesses AAA certification (WAI-AAA WCAG 1.0) as prescribed by W3C.

The second tier, called the ‘business logic layer’, contains the actual specialized services, generally implemented by using Web service technology to offer key services and utilities.

The third tier, or the ‘data layer’, creates the link-up between the various databases required to offer the various services that the municipalities, institutions and public organizations offer on their Web portals. Such databases contain all the necessary information to provide the services that citizens and businesses call for. Each institution and public organization involved maintains and manages its own databases and provides access to the data and information through the Web services from which the Web portals will subsequently contain the information and resources they need to offer the requested services. Finally, connections between the various different layers are achieved by means of resident software known as middleware.

With regard to the operating mode of Web services, this is designed so as to make the relative service available in a standard manner with the utmost ease of access. A Web service is created through the use of SOAP protocols that make it possible to send and receive XML messages over the Internet using the http format. This procedure enables cooperation between data processing systems that use diverse hardware and software structures, which are otherwise mutually incompatible. Moreover, it makes it possible to separate private databases and information from infrastructure as to make them independent from legacy systems such as Microsoft, Sun etc. In other words, this technology supports the use of languages capable of interpreting and bridging the gap between different technologies, above all XML.

Security is another fundamental problem that must be addressed and acknowledged in every step of the service offer. There are many devices and tools, such as secure connections and smart cards, designed to provide high levels of security and to build trust in this type of architecture. The choice of the most suitable devices and tools to make Web services more secure is strictly dependent on the specific features of the system.

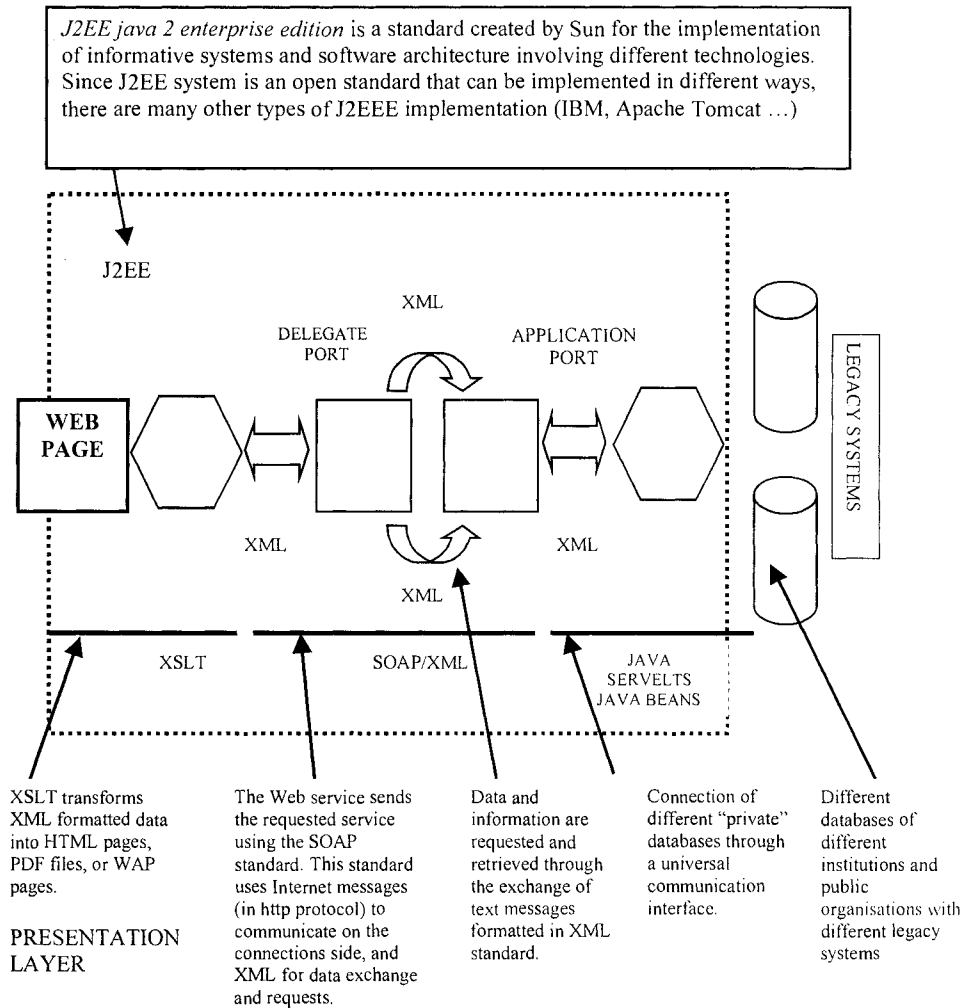


Figure 5-1. How a Web service portal works (adaptation from Venis S.p.A.)

It is important to stress that Web service portals do not have their own database. Instead, they retrieve the data and information they need for the presentation of services by means of Web services. In fact, thanks to this technological architecture, the portal infrastructure "can collaborate and dialogue with application services without requiring any data replication or

database mirroring” (Hagel and Brown, 2002). So Web services aid dialogue between information systems, constituting a universal medium that is able to link the different programs.

A Web service can also be interpreted as a black box containing databases and all the possible data handling processes. The databases and processes can be arranged in the way that individual institutions prefer, but externally they must present a W3C standard SOAP based on XML, which is the Web service to all effects. Each Web service can be different from the others, but it is constructed using a standard that makes it compatible with its peers and enables different applications and organizations to work together through electronic systems.

Figure 5.1 shows an example (loosely based on the experience of the municipality of Venice) of open Web service portal architecture that is widely applied in a variety of different contexts. The architecture considered is based on multiple layer software that makes it possible to separate the presentation layer and the client interface from the data source and exploits Web services to allow different applications and services to communicate so that they can be made available on a single point of access that uses html pages and the Internet as a communication standard.

6. CO-DESIGN IN PUBLIC ADMINISTRATION

As discussed earlier, marketing policies in private companies have recently started to acknowledge the importance of virtual consumer communities instead of basing their activities on traditional one-to-one marketing techniques (Micelli, 2000).

The question is: is this occurring also in public administration management? Are we witnesses of a kind of co-design of public services? The answer is not, and cannot be, unequivocal, but it is anyway certain that today’s Web portal users provide a substantial contribution to the definition of services.

In the information society, people are far more aware of their needs than in the past. In addition, the current post-Fordist production system makes it possible to make highly complex goods and services, thereby ensuring the highest possible level of customer-suitability.

But in order to achieve this process of progressive personalization and specialization of goods and services production, customers must be radically involved in the planning, design, and production stages, and the considerations, opinions, appraisals and recommendations of users springing from their direct experience in using the relative product or service must be examined with the utmost care.

In fact, users constitute a valuable source of information and suggestions for the producers of goods and services, and it is not only useful, but also absolutely essential to take care of these primary relationships (Von Hippel, 2001). In this way the product, whether a tangible or intangible asset, is not only more effective and user-suitable, but also more efficient and economical because the collaboration between producers and users makes it possible to avoid much wastage of time and money, can improve the image of the producer on the market, and also aid the achievement of a competitive advantage in the sector.

In the administration of cities in this stage of evolution it is essential to move beyond the traditional offer of services to citizens and to local economic systems, based on a vertical type relationship in which the authorities decide the type of service to be offered and how to provide it, attempting to second-guess and forecast the needs and desires of citizen users. In contrast to such a traditional approach, it is now becoming increasingly important to involve citizens and stakeholders of the local economic system directly in the definition of the goals of municipal administrations and in planning the actions to be undertaken.

The central idea is to regulate the relationship between the public sector and citizens through co-participation rather than through top-down type initiatives and relationships. Citizens are completely immersed in the life of their cities and the local social and economic fabric, so they can provide civic institutions with the right kind of feedback to improve the level of local administration. As mentioned above, a new kind of citizenship is developing, more aware and more active, and able to collaborate intensively with city authorities.

The co-design of municipal e-government services connected to Web service portals constitutes a major example of this trend and, at the same time, it represents one of the aims of the new phase of evolution of e-government: that of the broad-based diffusion of best practices construed as shared practices, or “average practices”.

In any case, the co-design of public services through on line communities, as is the case in other more “conventional” sectors, is rather difficult to accomplish in the short term because it obliges public administrations to meet citizens head-on, measuring up to their ideas, recommendations and needs and identifying new professional roles falling between citizens and the public sector, with the task of aiding and developing the pace of change and innovation. In fact, even if the public sector has changed greatly over the past decade and has been broadly modernized both in its organization and in the activities that are administrated, it is still extremely difficult to revolutionize its mindset and methods of intervention from the ground up. Despite this inertia, municipal

governments are the component of public administration that lies closest to citizens and the life of the local economic system, so it may prove beneficial to apply the precepts of co-design to the creation of services. This strategy could represent the first step of a far broader revolution in the planning and design of services of the public sector, and in the role assumed by citizens in the local level of state governance.

Today the effective and fully successful co-design of city services is extremely difficult and relatively poorly diffused. There are, however, several interesting experiences on the European level that it could prove helpful to study in the near future. In any event, interactive co-design can be extremely interesting and helpful and, more importantly, far more simple and risk-free in areas in which citizens are more skilled or are in possession of the abilities, competences, or knowledge of the local context (such as security, public hygiene, etc.) or in services linked to local welfare or social services wherein many non-profit organizations are active and have been offering a number of extremely effective high-quality services for many years (see chapter 7).

7. EUROPEAN CITIES AND WEB PORTALS: DISCUSSION OF CASES

A large number of large and smaller European cities have already seized the opportunities provided by Web portals to move closer to their inhabitants more rapidly. In the “On Line Citizenship” conference we examined six different experiences that confirm the importance of Web portals for the correct management of public administration and for the improvement of relationships with citizens and other Web portal target groups. Also in these cases, the pervasive attention of the cities involved in Web portal projects was focused on widening, as far as possible, the e-government and e-democracy processes already started during course of the past ten years; for example the cases of Gardabaer (box 2) and Tallinn (box 5) experiences are clearly initiatives styled on the concept expressed by “of the people, by the people and for the people”.

However, for a public administration to be e-democratic does not mean only to be open and willing to receive external requests for documents; there are many other functions and topics that are deserving of interactive implementation, which should always be generated on the basis of a serious and systematic analysis of the needs and desires of citizens. In this direction, the Bordeaux portal is a case of excellence (box 1). This is probably one of the most important experiments of the method to understand the needs and priority of citizens thanks to a radical and specific analysis implemented by

the SOPRA group, the private sector partner of the municipality of Bordeaux.

Box 1: The Bordeaux portal²

Bordeaux is the capital of the Gironde region and the prefecture of the Aquitanian area (the sixth largest French city). There are 218,948 inhabitants (600,000 considering the entire urban community).

This project aims to give citizens (and other user groups) a wide range of on line services offered by the city Web Portal, which are chosen according to “city directions”. Indeed, all city management areas are expected to express their needs.

The main goal of the Bordeaux Web portal is not the creation of a technical project but rather a project of the citizens who want to improve the quality of their lives in a more suitable setting. This means increasing the level of efficiency of the administration, developing active participation in democracy, increasing the quality of services and improving the overall image of the city of Bordeaux.

The Web portal is designed to meet the needs of various target types (general public, registered users, professionals, public partners, private partners, internal public, and specialized public). The primary target is represented by the anonymous members of the public who visit the site. These are followed by net surfers who register on the site in order to be able to exploit personalized services. Public partners are, for example, schools, universities, urban communities, and so forth. Private partners are mainly suppliers, while the internal target group concerns intranet users, with a degree of specialization in relation to individual roles or type of administrative services.

A process of needs analysis was implemented by the city council and a consulting company, resulting in the emergence of 45 directions expressing the various needs identified by citizens, this team thereafter decided to design the Web portal of Bordeaux around 15 topics (civic life and local democracy, urban projects/transport and town planning, society, families and school, administrative information, environment-cleanliness, road system, security, public health and hygiene, sports and leisure, cultural life, history and heritage, tourism and city animation, everyday life in Bordeaux, economy and employment, working in the city, and internal management of services).

² Box based on the address to the “On Line Citizenship” Conference by Pierre Laurent from SOPRA Group, e-government consultant for the city of Bordeaux. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

There are 154 cases of use within the foregoing 15 thematic areas. The cases are divided into 400 functions, serving the inhabitants through three channels (the Internet, extranet, and intranet) and two portals (a case of use can give rise to an unspecified number of functions, and a function can be served by an unspecified number of modules, modules representing the technical capabilities of the portal). Finally, a module can be involved in an indefinite number of functions. The analysis identified 16 modules (i.e. technical groups of solutions): content management, management of contacts and requests, secure transactions, multimedia resources, groupware, management of rights and entitlements, navigation & search engine, internal services, profiles management, communication, process and workflows, external services, dedicated services, geolocalization, hyperlinks and mailing lists.

The transition between needs expressed by means of cases of use divided into functions and technical modules allows the project to forecast the different versions of the portal. Two portals, an intranet portal and an Internet portal, supply their respective users with services. Some functions, such as on line reservation of books in the municipal library, are handled by the Internet portal and are then transmitted towards the internal application, thereby creating a level of dialogue between the two portals.

The major tools implemented for this project are portal software running on an application server, professional content management software, a professional geolocalization system and professional workflow software, which underpin all the Web procedures, including the publishing of contents.

The main scope of this initial analysis is to facilitate the decisions concerning the choice of services to provide. On the one hand management areas express their priorities, while on the other the management of the information system expresses its analysis of the relative complexity. This leads to the definition of the versions of the portal, with the aim of achieving a useful result rapidly without neglecting essential services.

Obviously the benefits deriving from the Web portal are mainly exploited in a large city (such as Bordeaux), although the usefulness of interactive services has also been observed in smaller urban centers; in example, Gardabaer (box 2) is a very small town (8,500 inhabitants) in Iceland, which can be considered to be a model in view of the services supplied and because of the organizational characteristics of the city portal project.

Mainly focused on e-democracy and e-government goals, this project benefits from the input of GoPro (a leading consultancy group in the e-government sector) in relation to strategies, services, and technology; in this context, it should be noted that "GoPro My Case" is the main technological tool that connects citizens, local governors and administrative employees.

Box 2: My Gardabaer³

Gardabaer is a small town to the south of Reykjavik, Iceland, a country that boasts a long democratic tradition dating back to 930 AD with Althingi. The town has around 8500 inhabitants (the entire country has a population of just 280,000) forming a small community with a full range of infrastructure in place.

The “My Gardabaer” project is designed to enhance the provision of e-government and e-democracy of this Icelandic city by improving services and their efficiency and effectiveness. The consultant for this e-government project is GoPro, in whose view in order to become a valid e-government tool the Web portal must become a co-producer of the services (the citizens play an active role in designing the production environment by participating in the decision-making process) rather than simply a governing power or a service provider.

The main goals of this project are therefore: to increase the efficiency of public services, to provide citizens with a global view of the activities of their local government, to increase the sense of responsibility among citizens and governors, to define the internal workflow in public offices, to facilitate the management of physical documents, to increase active participation of citizens and democracy processes, to give better services to the inhabitants of Gardabaer (40% of the local population are of the opinion that the provision of services is the main driver in the implementation of e-government).

The general understanding of e-government is that it has two main areas: the supply of citizen-driven services (back end), and the participation and information of citizens (front end); in the opinion of project consultant GoPro this view is flawed, since e-government is a two-sided coin that does not permit the implementation of on line services and participation of citizens without appropriate preparatory organization of the local government. This requirement calls for the redesign of the relative processes in accordance with these new interpretative methods.

The “My Gardabaer” project is a powerful tool to link citizens and the local public administration, although the portal was not created exclusively to supply interactive services to individual citizens; indeed, other significant targets of the project are businesses, local professional figures, and other institutions present in the area.

³ Box based on the address by Asta Thorleifsdottir, GoPro e-government consultant, Gardabaer, to the “On Line Citizenship” Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

The principal characteristic of the Gardabaer Web portal is the interactive nature of the services offered, which connect private residences and public offices in real-time. The main interactive applications are: the notification service, access to all documents both deposited with central government and those held at local government level; the diffusion of internal working practices, laws and regulations, the registration of clients (digital signature), citizens log-in to reserved access areas of the site, the provision of on line pay-to-access services, measurable and auditable services (components for benchmarking).

The Gardabaer Website was implemented to create a personal cyberspace for citizens; in this context, it allows registered users to access all the services on offer and the take part in public municipal life. For example, "My Case" is an on line follow-up service for individual citizens situations; here citizens can communicate with the community and authorities in such a way as to become active members of the e-government process.

The next steps for Gardabaer will be to facilitate public access to town planning through the use of IT, the use of real interfaces for citizens (not merely fanciful technology), the assurance of feedback to participants, and the involvement of political figures to ensure their access and participation. The Gardabaer portal is thus poised to become an efficient tool enabling participation in public life and the production of socio-economic benefits deriving from the involvement of stakeholders throughout the entire process, which must be easily understandable and ready to use.

Although Siena and Livorno are both medium-size Italian cities just a short distance apart, their projects are very different in many aspects: while the Livorno municipality project (box 3) mainly aims at optimizing its internal documentary flows, also by providing citizens with valid and efficient e-services, the "Siena Cabled City" project (box 4) focuses on services supplied by new technologies (PCs, mobile phones, TV with digital decoder, smart cards) to improve the quality of life of citizens and also to make it easier to address the information needs of tourists.

Perhaps the point that these two Tuscan cities have in common is the high level of commitment demonstrated by the two administrative authorities; in this context we will be able to see how the local governors of Livorno and Siena invested a large quantity of human resources, time, and capital, both for administrative employees and citizens, to accomplish their goals.

Box 3: “Documents workflow”⁴ project of the municipality of Livorno

Livorno is a medium size city in the middle of Italy, near Florence, with a population of 160,954. Livorno town council has 1,572 employees (781 administrative personnel) working in 20 departments (headquarters and decentralized offices).

The re-engineering process of the activities and procedures of the information system of the municipality of Livorno started with the “Documents workflow” project in 1998, which sought to exploit the opportunities offered by the Livorno civic network, launched in November 1995, and Labronet, a local corporate network which, in 1999, connected 20 local offices of the city council, by establishing a document and information management system used by all departments in a bid to create a paperless office as a prerequisite for the development of on line services.

The process was also accompanied by a diffused computer literacy process within the institution, with internal tutors and computer classes, with the aim of creating the necessary background culture in relation to the new method of working. There were also courses to aid understanding of the importance of the organization and management of documents.

The main goals of the Municipality of Livorno, which are relatively advanced, can be summed up in three main points: 1) to set up an information management system starting from a computerized protocol; 2) to create an information and document management system utilizing the integration facilities offered by the network; 3) to provide the facility to consult and update digital archives via the Internet.

In consideration of these objectives it should be noted that citizens are not the sole beneficiaries of the project undertaken by the Municipality of Livorno. The interactive services also allow the Web portal to be used by different categories of recipients (such as public or private organizations, institutions, and municipal employees).

The “Documentary flow” project performs several functions: for example, the function of information protocol, management of workflows and procedures, digital archives, institutional intranet, civic network, and on line services. Since March 2002, the project (information protocol, computerized management of procedures and workflows, and digital

⁴ Box based on the address to the “On Line Citizenship” Conference by Paola Jarach, Councillor for computerisation and telecommunication - the civic network - policy of resources and investments - heritage, with duties of deputy mayor of the Municipality of Livorno. The relative video is available at http://it.sun.com/eventi/on_line_citizenship.

archives) is based also on use of digital signatures and electronic identity cards.

Two Web portals have been set up for the “Documentary flow” project; the first is an intranet, i.e. an internal site utilized by staff to manage information within the council offices in order to improve the information flows from the back office to the front office and to manage access to internal on line services of general interest. In contrast, the second Web portal is the civic network, a public Website created to simplify and increase the transparency of the procedures by supplying comprehensive and easily accessible information, facilitating access to public information, providing the facility for reserved access, allowed by law in a secure manner by using digital signatures or electronic identity cards, and, finally, to deliver interactive on line services. Public archives are accessible and consultable using the same application via the institutional intranet or over the Internet.

The main interactive public services guaranteed by this project are an on line registry office, e-procurement (with on line tendering), and on line commercial and administrative procedures. Using digital signatures or electronic identity cards this project makes it possible to initiate administrative procedures, obtaining a receipt with an official protocol number via e-mail, correcting errors or supplying any additional data requested (via e-mail) by the cities municipal offices. For example “*Anagrafe on line*” (a restricted access service) allows the compilation of on line services (self-certification, retrieving data from the registry office database via the Web) using a password and PIN or electronic identity card.

In the future, with the diffusion of electronic identity cards, it will be possible to dispense with the use of PIN and password for the on line services available (for example, local council taxes or registry office data).

The most important results of the Livorno project have been the positive feedback received from council employees (850 work stations connected on a local network) and the fact that it has increased the confidence of the workforce in relation to administrative innovation based on new technology in order to re-engineer office procedures.

Future development of the on line services platform envisages greater diffusion of electronic identity cards. During the first experimental phase some 2,500 cards were issued, while in the second phase, which is now beginning, a further 30,000 electronic identity cards will be issued over the coming twelve months.

For this purpose the Municipality of Livorno intends to issue cards to all citizens as soon as possible, in such a way as to promote their perception not as merely identity cards, but rather as a means to access the platform of on line interactive services.

Box 4: Siena Cabled City⁵

Siena is a medium size city in Tuscany in the central area of Italy near Florence, famous across the world for the “Palio” historical horse race. It has 56,798 inhabitants.

The history of the city of Siena’s computing and telecommunications activities is long and eventful, dating back to 1994 (ISA – Automatic Service Information); the main technologies utilized for the current project are a fibre optic network, a cable network, and the ‘Head End’ wireless broadcast system.

The project focuses on the creation of broadband interactive services. The entire city was equipped with a fiber optic network, which supported the creation of a new series of services. Thus, through the use of a series of basic devices (PCs, mobile phones, TVs with digital decoder, and smart cards), citizens, businesses and tourists are provided with access to a large offering of information and services. In May of 2002 the Siena city council set up a public enterprise called “Siena Innovazione” to manage local television and interactive services.

There are several satellite projects connected to “Siena Cabled City”, such as Siena card (to provide access to services, transfer data, and make payments for services received), or an electronic identity card with digital signature (an identification tool for e-government policies by means of a smart card offering different services). Finally, there is also PALIO (Personalized Access to Local Information and services for tOurists), which provides tourists with access to a huge store of information about traveling to and spending their holidays in Siena.

The main aim of the project is to allow citizens to use the proposed services by using widespread technology such as TV sets and computers. Through the use of cable TV and interactive services (via PC, TV, mobile phones) Siena municipality plans to achieve three main results of relevance to the lifestyle of the city’s inhabitants, improving the level of social inclusion, communication between citizens and public administration, and the quality of services rendered.

This is probably the project characterized by the greatest diversity in terms of target groups; in Siena the key users of the portal are not only citizens; a far wider range of categories (including companies, public employees, and tourists) will be able to enjoy the benefits of these interactive services.

⁵ Box based on the address by Miranda Brugi, IT Manager of Siena municipality, to the “On Line Citizenship” Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

Siena municipal authorities supply a large number of e-services. For example, depending on the technology used, television allows a large number of local residents to access information in real time, to engage in e-commerce transactions, home banking, and e-government functions, accessing information on specific communities, e-learning initiatives, and healthcare services.

With regard to the services provided over the Internet, these can be divided into three main areas: demographic services (intelligent self-certification, on line addresses, on line certification services), authorization and license services (several services offered by the one-stop-shop for businesses and citizens will be included in the electronic identity card) and other services available to private individuals (requests for maternity allowances, registration with the revenue department, requests for family allowances, requests for child day-care service costs, requests for school transport payments, enrolment in schools, etc.).

The electronic identity card, featuring smart card technology and providing access to both standard and specific services, is a valuable identification tool for e-government policies; thanks to the characteristics of the cards (cryptographic co-processor and sufficient memory to store the relative security certificates) the electronic ID card can be viewed as a tool for the provision of signatures that are compliant with the specifications of authorities. In addition, the electronic ID card can be used to forward requests and receive legal and administrative documents since it is a reliable means of identification for both individual citizens and private organizations, recognized by the public departments to which requests are addressed.

In the near future, the forthcoming objectives of the Municipality of Siena will mainly concern interactive service users. In this context, Siena Municipality considers that in order to create a comprehensive set of on line services it is essential that users gain an understanding of the relative security level and that the services offered effectively respond to the needs of potential users.

Although the projects of Livorno and Siena are excellent examples of how a municipal administration can bridge the gap towards its citizens by using new technologies, perhaps the best example is represented by the case of the Estonian capital, Tallinn (box 5).

Tallinn, a point of contact between different cultures and economic environments (the city's population is 50% Estonian and 41% Russian) has become a meeting point for the business community and also for tourists from all over the world. The consequences of this role are the need to improve the level of services available to all those who visit and live in the city, and offer the most comprehensive possible access to municipal

information, the personal data held in civic databases, and on the decision-making processes of the public administration.

Box 5: E-Tallinn⁶

Tallinn is the capital of Estonia, a youthful republic on the shores of the Baltic. With many centuries of history as a major port, the city of Tallinn is seen as a bridge between East and West because of its geographic location. The city, which is divided into 8 districts, has a population of 381,389.

Tallinn is an ideal place in which to implement modern technologies. The city has all the necessary infrastructure, including modern ICT networks, needed to develop new products and services. Against this background, the local government decided to accompany this historic city on a course of transition into an e-city developed on the basis of the capabilities of new technology.

These ideas are outlined in the Tallinn city development plan, which also describes the new role attributed to information and communication technologies, especially in supporting major business operators; the main processes of municipal administration will be implemented through the use of these new tools, which offer enormous opportunities for citizens, authorities and all other local stakeholders.

The main projects launched on the local level include the city's official Website www.tallinn.ee (a virtual information center for citizens), the city government session information system (including a description of mobile office solutions for members of city council and other city employees), the city council and government document registry, the financial management information system, land registry office, social care information system, and, finally, the municipal intranet.

Each part of the portal provides either a link to another portal or to a Web page concerning the specific topic and related projects, via a series of sub-portals and pages offering a broad range of information and tools.

The main goals of the e-Tallinn project are to improve access to information for local citizens, others, and institutions, and to increase active participation in public life and democracy through new technologies. It follows that the e-Tallinn project is mainly focused on local players such as citizens, local companies and professionals residing in the Estonian capital.

All e-services implemented by the Tallinn Web portal are aimed at involving citizens and local organizations as much as possible in local

⁶ Box based on the address by Olev Vaino, IT Manager of the Municipality of Tallin, to the "On Line Citizenship" Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

affairs. For example, the Tallinn city government sessions information system was developed as a part of the municipal IT system, and it carries a full range of information concerning current and past city government sessions. All the information is freely accessible by all visitors to the site. Other services available on the Portal for citizens and local companies include the register of legal acts and the management system of city council proceedings and deeds.

Other tools used to give citizens access to information consist in various sub-projects such as the Tallinn city digital document processing information system, or DDPIS (including the city legal acts register), the Tallinn city government sessions information system (developed on an HTML platform and integrated with DDPIS, notebooks, Wave LANs and cable LANs), the city council legal act management system and the city government document register.

The first short-term objective for the Tallinn Web portal will be to increase the number of e-services available for citizens. Another aim is that of revising existing economic and administrative processes and procedures: through the use of ICT several economic processes can be performed without the direct participation of citizens (information systems will be accessible anytime and in anyplace), business documents can be validated anywhere and certain employees will not be obliged to physically attend a fixed office-based workplace. Associated with this concept, another crucial topic for the future will be business meetings, which will be organized in a more flexible manner to allow time savings. Finally, also in the Tallinn project an increase in the number of electronic identity card holders is seen as a crucial step in the process of achieving an increase in the level of activity of the portal.

As in the case of Tallinn, the Venice project (box 6) is primarily focused on citizens. Designed mainly to facilitate tax payments and provide users with useful information, the Web portal created by the Municipality of Venice assumes a leading position in Italy because of its standards and services.

Indeed, the site was developed in accordance with the detailed recommendations of the Italian ministry of technology and innovation, and, in particular the guidelines provided by the department of public functions for institutional Websites (communication metaphor, accessibility according to the W3C standard and interaction), thereby becoming a genuinely effective tool in simplifying the life of citizens.

Box 6: The Venice city council services portal⁷

Located in the North East of Italy and famed for its gondolas, historic canals and bridges, the city of Venice currently has 305,617 inhabitants. Because of its unique geographical location and composition (divided by the lagoon and subject to major logistic difficulties) the importance of digital public services for Venetians is particularly critical.

The main aim of the project is to provide innovative services for citizens, professionals and companies. Venice Web portal is an infrastructure designed to increase the level of cooperation among different departments. It also provides a single point of access for on line interaction with the public administration and it simplifies relationships between the target groups of private citizens, professionals, and companies and the city council.

There are many aims linked to the Venice Web portal, the most important of which is perhaps to implement increased levels of transparency in relation to the actions of the public administration and to monitor the feedback on workflows. In fact, the services can be used by different local and public administrations using the same architecture. Other objectives include a drive to reduce the digital divide among the population, reduce costs connected to physical transactions, and improve the internal organization and workflows of the city council.

The main services provided by the Venice civic network concern the consultation/payment of traffic offence fines, the consultation/payment of COSAP taxes (COSAP is a tax for the use of public land for commercial purposes), the consultation/payment of CIMP taxes (tax for the use of advertising in public areas), access to files and records related to building and trade, calculation and payment of ICI (municipal real-estate tax), start-up of the implementation phase of the one-stop center (SUAP) and, finally, the reception of SMS messages informing users of events of general interest.

One of the most significant project features discussed by Marco Bettini was the method of authentication employed; Venice city portal is specifically designed for the use of electronic identity cards, national services cards, and digital signatures, as authentication tools. While awaiting the distribution of these smart cards various other methods have been tested including the association of personal data, PIN numbers and passwords (transmitted asynchronously) and the use mobile phones.

In the association of personal data, users enter a range of confidential information the correct combination of which provides an acceptable level of

⁷ Box based on the address by Marco Bettini, project manager of the Venice municipality Web portal to the "On Line Citizenship" Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

security. In addition, the data provided are not explicit and are of significance exclusively for the individual user in question. This authentication method has been used for the payment of road traffic offence fines and COSAP and CIPMP taxes.

The use of a PIN number has been experimented by suppliers of the city council to display invoices and the associated payments. These users receive, in an asynchronous manner, a PIN number via email and a password by regular mail for authentication purposes.

Authentication via mobile phones (the system employed is called Keyphone) is available for professional users and business to access records and files. This method is based on the use of the mobile phone SIM card and it works without generating telephone traffic (i.e. it is free of charge). The caller's number can also be used for to address SMS news messages.

The architecture adopted grants a high level of security and makes it possible to use multi-channel tools (SMS, e-mail, WAP, etc...). Furthermore, this technology allows the use of languages capable of interpreting and bridging the gap between different technologies: the Portal makes use of XML messages to communicate with the back office, while communication is based on the SOAP standard protocol. This three-tier architecture divides the Portal into three totally independent blocks: Front end (Web portal), transportation, and back office/legacy systems.

One future aim of the Venice municipal Web portal is to increase the technological level of services provided; this goal is reflected, for example, in the implementation of new payment services, the transmission of documents and certificates over the Internet, SMS information on the status of various transaction records, access to internal databases and the use of digital signatures.

After this brief introduction to the six civic portals presented at the conference, we can define several key points in relation to strategy, implementation and the future of these new types of public services projects.

With reference to strategy, it appears evident that there are at least two types of macro objectives that guide the subsequent planning stage and the strategy of operative implementation; while the first goal is principally dedicated to the openness and transparency towards citizens of public sector activities and information, placing them in a position to embark on a process of co-design of public affairs and issues (as in the case of Gardabaer and Tallinn), the second macro objective is mainly focused on the provision of interactive services, not only for citizens and other local stakeholders, but also tourists and foreign organizations (see the Livorno, Siena or Venice projects).

Despite this relative clarity, it is far harder to understand when a civic Web portal is of the first or of the second type. If we consider the above-illustrated cases, none of them are totally devoted to the pursuit of a single category of objectives. The Gardabaer project, for example, is simultaneously a useful tool for involving citizens in the public decision-making process, and a Website offering a large number of e-services for its target user group.

However, irrespective of the goals, it can be perceived that the idea of certain authors (Hagel, Brown, 2002) whereby the trend of the purchase and sharing of IT technology as services provided on the Internet will tend to prevail over the direct ownership of the necessary hardware and software, finds a certain level of practical application, as demonstrated by the cases of Livorno and Gardabaer.

Another area of interest is the effective technological implementation of Web portals of this type, which must first overcome at least two problematic issues: the digital divide, and the question of accessibility to the portable that may arise from the creation of an excessively specific and poorly user-friendly civic site, the primary obligation of which is to be as democratic as possible. Sensitivity to these issues is shown by Venice's Web portal (which has been awarded AAA - WAI-AAA WCAG 1.0 - certification by W3C), which provides easy and indiscriminate access to all citizens. Also in the case of the Bordeaux portal, complexity management is a significant issue, with all versions of the portal designed taking specific account of the abilities of the potential user group.

The critical area is that of security. All the projects presented in this work recognize the criticality of this problem. In the words of a representative of Siena city council "users need to be aware of the level of security of the services" before it is possible to arrive at a truly satisfactory level of operation. Even though the current situation is far from bad, all the methods, infrastructure, and procedures aimed at guaranteeing security of citizens' data and information (such as electronic identity cards, PIN numbers and passwords, digital signatures, the SOAP protocol, smart cards, and so forth) must improve their ability to reassure citizens with respect to the security of digital services and transactions (following the steps already taken in this direction by private commercial portals).

Finally, the main objective that has clearly emerged from the current discussion concerning the future of civic Web portals will concern the increase in the numbers of the population in possession of an electronic identity card. This e-development calls for supporting actions both at a national and local government level, as in Livorno, where the municipal administration has set up free public Internet points in public offices and libraries.

8. CRITICALITY AND FUTURE DEVELOPMENTS

8.1 E-service Implementation Problems

From the observations and analysis of the various experiments presented, it is fairly clear that even though these digital cities are very different from each other in terms of geographical, social, political, cultural and technological features, and even if the projects and services provided can be very different, in order to meet the needs of end users more closely several points of convergence can be defined in relation to implementation difficulties.

Analyzing the effective implementation of Web service portal projects, it is frequently possible to identify a gap between the initial objectives, projects, ideas and promises and the effective results, applications, uses, and changes actually accomplished.

These differences are related to difficulties encountered in the creation and implementation of the projects as a consequence of the emergence of problems of a financial, economic (costs and benefits, rates of use of products, etc.), organizational, and technological nature. Other difficulties concern the level of cooperation with partners, the participation of citizens and companies, the differences between the potential level of diffusion and use of specific tools and their actual diffusion and utilization.

The most common problems are related to limits in terms of the endowment of availability of resources, e.g. in the budgets of certain cities or local administrations or in the limitations in terms of human resources, plus difficulties in the organization and employment of resources, or in the organization and control of collaborative relationships and partnerships.

The problem of organization, coordination, and collaboration between different parties and resources in terms of expertise is absolutely central. It is no simple matter to launch projects, even when aided by expert consultants; this complexity leads to the point in which the period of maturation of the project is seen as being excessive with respect to the expectations and needs of its potential users: citizens and business.

This kind of project calls for concerted support from all levels of authority and all stakeholders in order to arrive at completion, in addition to the support and participation of users. This is even more evident in the fact that it is frequently necessary to set up, implement, and manage a large number of multidisciplinary teams (focusing on content, design, navigability, technology, re-engineering, and so forth), making it difficult and complex to integrate all the organizations involved in the creation of a shared project.

As has been pointed out by some of the spokespersons of the cities that took part in the conference, in order to translate these propositions into reality, a strong and clearly defined political intention and stability must be displayed and constantly improved, starting from the principle of clear and explicit guidelines in relation to how to design and implement the projects, how to act, and how to set up relationships of collaboration. Another essential ingredient is the presence of significant capabilities concerning how to best use and invest public and private funds and also how to achieve the broadest possible involvement and participation of all stakeholders.

In any event, most speakers agree with the claim that re-engineering is sometimes required not only in relation to certain public administration departments and organizations, but also certain specific service structures.

When a service is offered and implemented it is necessary to create a corresponding and properly organized back office with the necessary degree of effectiveness and efficiency. It is also helpful to attempt to neutralize the sense of disorientation that many users frequently experience as a result of the large number of different public administration portals available. The aim is to achieve a level of use such as to allow application to function with the required degree of involvement, and to enhance the participation of citizens and businesses.

The influence of technology in the implementation of e-services is linked to the gap between the potential offered by technology and the effective use and diffusion of the services themselves. Digital city experiments are often plagued by problems of an unsatisfactory rate of use. The reasons for this apparent failure are mainly to be sought in the digital divide issue and problems related to the sharing of standards and technological infrastructure (see broadband).

As already noted earlier in this chapter, another fundamental problem concerns the guarantee of security. The services provided on city portals are often of an extremely sensitive nature and personal data must be protected. Unfortunately many administrations have as yet failed to solve their authentication issues.

8.2 And For The Future?

In the future we will need to focus more strongly on economic effects in terms of a more in-depth consideration of the costs and benefits of each project and initiative in such a way as to define them as accurately as possible, while taking into account also financial, technological, and organizational issues and matters of cooperation.

Studies and improvements are required not only in relation to projects for on line services, in order to promote them and streamline them to the

greatest possible extent, but also the consequences of each of the parts. Enthusiasm and good ideas are seldom sufficient to ensure high quality on line services.

Another important requirement is that of investing in the involvement of citizens, considered in the broadest possible terms. In this context it should be considered that civic Web portals will only be able to identify the correct directions in which to improve their services in both numerical and qualitative terms by stimulating citizens and providing incentives for them to switch to an electronic type of interface with municipal authorities.

European cities, which have taken the first tentative steps only in the past ten or twenty years, must now aid this transition by improving the digitalization process in order to leverage all the opportunities offered by the civic networks to their best possible advantage.

Obviously this transition must be economical, or at least it should only have a minimum impact on social costs. Indeed, in the words of Hagel and Brown (2002), Web portals must “deliver more value with fewer resources”. One possible answer to this issue is to personalize the services offered as much as possible (in line with the actions taken, for example, by the city of Bordeaux). This approach makes it possible to save significant resources that can be used more profitably in the development of better solutions.

In compliance with this point of view, the co-participation of public administration, co-design, and modularity, become not merely the sole tools able to facilitate processes of e-government and e-democracy, but also strategies to avoid wasting public money.

Chapter 6

RE-USE OF SOLUTIONS AND OPEN SOURCE SOFTWARE IN PUBLIC ADMINISTRATIONS

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1. INTRODUCTION

Over the past few years the re-use of solutions and open source software have assumed a key position in the political and scientific debate regarding e-government strategies. Administrations of large cities such as Vienna and Munich, entire departments of national governments such as the US defense department and the department of culture and communication in France are planning the migration of their information systems towards open source technologies. Large companies in the information and communication technology industry are reshaping their competitive strategies, focusing on the provision of services and consultancy on open source software implementation and customization in the private sector and public administration markets. National e-government strategies, including those of the Italian government, are focused on the re-use of solutions as a tool to foster the standardization of IT infrastructure, administrative procedures, and organizational solutions, while several pioneering municipalities, such as that of Liverpool, are entering into partnership with IT companies in order to develop solutions that can be re-used by other administrations on payment of a license fee.

Initially, a powerful incentive for the adoption of approaches based on the re-use of solutions and the adoption of open source products came from the widespread assumption that these strategies would be effective in lessening the dependence of public administrations on software vendors and creating significant financial savings on the management of information systems. It was argued that practices of re-use would allow the

rationalization of expenses in the development of e-government solutions by drawing from the existing national stock of solutions developed in specific contexts but presenting suitable characteristics for broad based implementation in other administrative contexts within the same country. Since it is essential a no-cost option because of the absence of license fees and the freedom granted to users in distributing and replicating the applications, open source software was seen as the key to achieving significant reductions in implementation, maintenance, and update costs with respect to IT systems based on proprietary technology.

Despite this substantial absence of costs in the adoption of re-usable solutions and open source software, analysts and practitioners soon started to point out that there were other specific costs associated with solutions of this type. In this case, the cost structure is determined by adaptation, customization and learning costs that could sometimes be on a par with those of traditional proprietary software. Re-usable solutions are developed in specific contexts to respond to specific problems and needs and they can not be immediately implemented in other organizational contexts, even when these are similar to the original setting, without a process of customization, updating of professional skills, and adaptation of the solution to contingent organizational processes and structures (or adaptation of the organization to match the capabilities of the software). Another aspect is that open source applications are frequently marred by their substantial incompatibility with the installed base of public administrations' proprietary software, which constitutes a *de facto* standard: the integration between open and proprietary solutions often calls for large-scale investments in programming, management of legacy systems, user training, and similar.

On the basis of these findings, the initial enthusiasm gave way to more concrete and pragmatic decisions and comparisons between open and proprietary solutions, based on considerations of quality/cost ratios, with costs being considered over the entire lifespan of a solution (adaptation, customization, training, and so forth).

The evidence emerging from the first attempts to implement reusable and open source applications and solutions in businesses and public administrations has not discouraged further exploration of the related opportunities and potential. Analysts and practitioners changed their vantage point, shifting their evaluations from simple considerations concerning cost and convenience to issues of innovation and effectiveness. This means that rather than merely low cost alternatives to proprietary software, open source and reusable solutions must be seen as a new framework in which to innovate the ways in which information systems are managed and the ways in which organizations can improve the applications they need. In particular, as many pioneering experiments in the field of public administration are

showing, open source and reusable solutions represent two ways of enlisting the assistance in the innovation process of several players hitherto excluded from the generation of innovative knowledge: local public administrations and their social and territorial contexts (citizens, businesses, organizations and institutions). For example, in the case of re-usable solutions, logic suggests that by building suitable platforms for information exchange and communication between administrations it should be possible to exploit on a wider scale the innovative work carried out in a specific context (i.e. a city): the solutions developed by one administration can be transferred implemented in almost every local situation characterized by analogous problems and needs. This means that cities and local public administrations can be valuable contributors in the drive to create novel solutions and accumulate innovative knowledge that can be extended within a national or European context through adequate communication and corresponding efforts made by national governments or European institutions. Although it may be costly and difficult to transfer an application and adopt it rapidly, innovation processes occurring at the local level do produce valuable knowledge that can be re-used elsewhere, such as innovative organizational solutions, new workflows, and new technological architecture, regardless of the actual replication of the software itself. Even if the specific software produced by a local public administration cannot be re-used in other contexts, it will help to generate a knowledge base at different levels that can be re-used by other administrations in the development of solutions. In this way, the exchange of best practices and knowledge emerging from specific innovation processes can help achieve the important goals of standardization and interoperability.

The distributed nature of open source development projects constitutes a second important field in which local public administrations, businesses and citizens can experiment with new ways of contributing to the process of innovation in the provision of administrative and public services. By liaising with open source software developer communities, local public administrations can adopt a specific application and contribute to its evolution while enjoying the benefits of full access to a global pool of experts and developers ready to fix problems and suggest solutions. Assuming legacy systems do not present problems of interoperability, open source software can help reduce the dependence of public administrations on proprietary software vendors. Moreover, because they allow total freedom for users in adopting, copying, and distributing applications, open source licenses foster re-use practices and hence standardization and interoperability among information systems and administrative procedures:

all valuable enablers assisting in the emergence of a more mobile and integrated Europe.

This chapter aims to analyze the opportunities associated with the introduction of reusable and open source solutions in public administrations. It will consider both the advantages and difficulties associated with reusable and open source solutions, illustrating various instances of advanced experimentation and initiatives currently under development throughout Europe, with a particular focus on municipal administrations.

2. RE-USE OF SOFTWARE SOLUTIONS IN PUBLIC ADMINISTRATIONS

For public administrations, the re-use of software solutions is a valid approach to the extension of innovative knowledge created within a specific context, e.g. a city, to other contexts experiencing similar needs¹. In practical terms, the re-use of solutions and applications means reproducibility, in numerous contexts, of innovative knowledge created in a specific setting. There are several advantages associated with this approach. In the first place, the diffusion and adoption of best practices allows general improvement of processes across all the administrations that adopt one particular solution or application.

In the second place, in a European perspective, the replication of knowledge, competences and products resulting from effective and innovative action makes it possible to rationalize human and financial resources: the availability of a library of knowledge and solutions ready for use means that resources can be freed from design and development projects already successfully completed elsewhere.

¹ The concept of re-use was introduced for the first time in computer science literature designating the re-use of existing software modules in new applications (Lynex and Layzell, 1998; Sherif and Vinze, 2003). In the public administration debate, it denotes the re-use of solutions (technological and organizational) implemented for the provision of a service (CNIPA, 2003a; Pizzicannella, 2003). The breadth of the second meaning, which includes both the software and the practices of workflow management, technological architecture, and the definition of detailed specifications in relation to technical and organizational aspects, makes it possible to prevent artificial separation between products (the software) and organizational and managerial issues. Indeed, even considering simply the adoption of application building blocks, re-use impacts on the methods of management and creation of knowledge and on the processes existing within a given organization (Lim, 1998).

Thirdly, and partly as a consequence of the previous point, rationalization of resources on a Europe-wide level increases the variety of the resulting solutions adopted in relation to a vast range of problems. Without a clear re-use based policy, each administration, local, regional or national, would have to embark in the ground-up design of all the solutions needed in relation to its operations and the drive to implement improvement in its processes. The possibility of utilizing knowledge and solutions already developed by others and the presence of a network that keeps the administrations informed, makes it possible to expand the range of requirements fulfilled by specialized development processes.

Finally, re-use practices, through the generalized adoption of solutions and processes of diffusion, support the emergence of technological and organizational standards, promoting interoperability between solutions and standardization of the provision of services to European citizens. Numerous European e-government projects emphasize the importance of the re-use of software and technological solutions in order to develop technological infrastructure capable of supporting rapid, efficient, and rational development of the information society.

In this context, the approach to the development of administrative solutions changes radically. For example, the information system of employment center or an innovative structure of the workflow for the distribution of services, developed by an administration to address a specific need, can be transferred, if suitably promoted, to other public administrations potentially interested in re-using the relative solutions.

2.1 Re-use Of Software Or Re-Use Of Knowledge?

Focusing excessively on the transfer and re-use of applications and software modules (see note 1) within e-government projects risks diminishing the potential benefits of re-use strategies in public administrations. The transfer and re-use of a software product can, in fact, be hindered by organizational *inertia* in the recipient administration. The adoption of a new application often involves a process of adaptation and modernization of organizational procedures. Moreover, a software product created and developed for a specific local context cannot always be easily applied to other contexts. The adaptation and optimization of a software product in a new context often requires financial resources and considerable efforts in terms of planning, reorganization, and training, in order to match the product more closely to the characteristics of the new context (Lim, 1998; Sherif and Vinze, 2003).

In developing a solution – a technological and organizational platform for the distribution of a service – an administration creates an innovative knowledge base that can be re-used at various levels and in numerous ways. On a preliminary level it can be argued that an administration that develops a new solution generates three types knowledge that is potentially reusable in different contexts and in different ways:

- organizational knowledge (inter- and intra-organizational procedures and relations);
- knowledge related to the service (workflows, interfaces, delivery channels);
- technological knowledge (software, technological architectures)².

With reference to the first point, specific organizational solutions, ways of interacting with other administrations, and redefinitions of internal organizational processes found to be effective in specific contexts, may be re-used regardless of the technological choices involved in their implementation. On the second point, the design of a solution can be the result of new configuration of the workflow supporting the distribution of a service, which is potentially applicable in other contexts, once again irrespective of the technological background. Finally, in relation to the third point, the value of a software product or specific technological architecture may reside not only in the program code or individual building blocks, but also rather in the detailed specifications and requirements that guided its development. That is to say that the detailed specifications driving the development of a specific software solution in one administration may provide a useful frame of reference in the development of similar software in other administrations.

To the extent in which the service or the need addressed by a specific application are standardized and uniform in a given area, such as a country or the whole of Europe, the transfer of software products is simplified and the costs of adaptation are restricted to because only a handful of minor changes are required (e.g. language localization). Another valuable approach, in the case of standardized services and needs, is represented by ASP (Application Service Provisioning) strategies, wherein the application is not physically transferred to the re-using administration wishing to implement it within its own information system, but it is used remotely by

² These types of knowledge generated in the processes of development of new solutions follows the classification of the components of a complex e-government solution set up by the Italian government presented by Pizzicannella (2003): service component, technological component, and organizational component

accessing the information system of the administration that originally developed the software.

The cases of the Portuguese government and of Liverpool city council, illustrated in the following boxes, are emblematic of how strategies of re-use can affect the different components of a solution.

The Portuguese government project (see box 1) aims to coordinate a network of innovative districts scattered around the country in order to accelerate the development of the information society in Portugal. The basic idea is that of stimulating the creativity and the entrepreneurial spirit of various clusters by setting up innovation networks – organized around universities and city administrations – composed of private enterprises, public institutions at all levels, and citizens. In this context, the role of universities is to act as catalysts of innovation, supporting and guiding the players in the territory (individuals, businesses, and public administrations). The Portuguese government will act as an interface between the various clusters by promoting the re-use of innovative solutions developed in specific contexts, supplying information relative to the projects under development throughout the country, allocating resources, and supporting the creation of partnerships and collaborative relationships. Rather than starting from the software, the Portuguese government plan focuses on the re-use of approaches to problems and on the organization of local authority and business networks in the drive to promote economic growth on a nationwide level.

In contrast, Liverpool city council (see box 2), in partnership with British Telecom, has developed a complex technological architecture for telecare, which has been experimented and optimized in the city of Liverpool and is ready to be re-used in full in other cities in the UK with only minor modifications. The solution of Liverpool is based on a multi-channel platform designed to monitor the behavior of disabled or elderly citizens. The system is made up of intelligent sensors that provide feedback to a call center and that can trigger a range of different actions in the event of emergencies. The aim of the partnership between the Liverpool city administrative authorities and British Telecom is to generate revenue during the rollout phase, in which other cities will be offered the solution on a turnkey basis.

2.2 The Benefits Of Re-Use Strategies

The re-use of applications has a number of positive effects on public administrations at different levels:

- a) Investment. Re-use makes it possible to maximize the effects of the initial investment. In European countries, for example, national funding for the development of e-government solutions sees re-use as a key factor in terms of investment rationalization, since it increases the scale economies of single solutions, which are developed for a specific context and subsequently re-used nationwide, thereby avoiding expensive replication.
- b) Standardization. Re-use of applications favors the creation of standards in the distribution of services, in organizational structures, and in technologies, both nationwide and on the European level. For citizens, the standardization of services and methods of distribution represents an important step towards the realization of the tangible concept of European citizenship in a context of increasing mobility of people, goods and ideas.
- c) Interoperability and cooperation between public administrations. The re-use of software fosters interoperability between public administrations – at the national and European level – facilitating the interchange of data and information, and cooperation in planning and delivering added-value services.

2.3 Coordination And Cooperation In Re-Use Strategies

A re-use oriented approach to the development of solutions represents an important opportunity to empower the contribution of local administrations towards the development of the information society in Europe.

An administration that has developed a solution for a specific problem generates innovative knowledge, the value of which can be exploited in various ways: new approaches to solving particular types of problem, new organizational solutions, new software and technological platforms, new procedures for the delivery of services. The European Union promotes and diffuses strategies of re-use as a driver of efficiency and multiplication of solutions and approaches in the solution of a problem. The role of local communities and cities as areas of experimentation is crucial.

The presence of “innovative” city administrations is however in itself insufficient. In order to exploit the value delivered by strategies of re-use national governments, European institutions and other players, plus municipal networks (such as TeleCities), must act as facilitators and coordinators.

The cooperative strategy adopted by the Italian MIT in the development of e-government services is an effective example of how to empower the innovative ability of regions, city administrations and local institutions. The second phase of development of e-government in Italy is focused on the

realization of “federal systems” (see chapter 3). Sector-specific federated systems, and, more in general, e-government solutions, have “a high degree of reusability in various general territories, [...] it can be claimed that the solutions implemented within one administration can be transferred to another administration of the same type” (Commissione Permanente per l’Innovazione e le Tecnologie³, 2003, p. 28).

The re-use of solutions constitutes an important strategic lever for the involvement of all public administrations in the design of e-government strategies. The MIT acts as facilitator by defining an approach able to facilitate processes of re-use (Pizzicannella, 2003). In short, activation of a process of re-use calls for the characterization of methods that allow:

- administrations that have developed a solution to state the conditions and methods of re-use;
- administrations interested in reusing solutions to assess the options available and decide whether or not the relative offer is adequate (MIT and Pizzicannella, 2003).

These methods constitute the basic steps to allow developers and potential users to define the types of solution available, the problems to be solved, and accordingly, how to acquire and re-use a given solution. This information represents the fundamental content of a database that makes it possible to achieve a perfect match between supply and demand and comprehensive exploitation of existing solutions.

Supplying tools to aid understanding of the needs of potential re-users and promote convergence towards existing solutions makes it possible to assist smaller municipalities, and, more in general, less aware users who lack clear and in-depth understanding of e-government and the related solutions, in the choice of the most suitable solutions to adopt (MIT and Pizzicannella, 2003).

Another interesting example of a national government engaged in enabling processes of distributed innovation and in exploiting the value of re-use strategies can be seen in the ‘Portugal Digital Nation’ project. The Portuguese strategic plan, in fact, is based on the activation of “innovative districts” composed of local administrations, enterprises, research centers and universities, in order to produce innovation in sectors of e-government and e-business. Such innovation is ideally suitable for re-use on a nationwide level through government actions of interface and coordination.

³ A commission composed of the presidents of regional administrations and MIT.

Box 1: Portugal digital cities & regions: a Portuguese government project

Anancom⁴ has recently provided a statistical overview of the development of technologies in Europe. To aid the arrival at an understanding of the corresponding situation we provide the following information on Portugal⁵:

- The country occupies the sixth place in Europe in terms of the number ISP connections with a total of 4,717,965 (45.60%).
- Portugal is in the seventh place of the ranking of countries with the highest number of mobile phone users with 8,343,700 consumers (up to 80.70% of inhabitants).

In Europe, over recent years, a large number of political initiatives have been launched, either as a direct response to the e-economy (direct e-economy policies) or to build an e-dimension into existing policies. Likewise, on a national level a large number of political initiatives related to the e-economy have been undertaken. However, it is not always the case that the various national measures have been properly acknowledged, understood and exploited on the European level. A more comprehensive overview and a better exchange of information among the various players could greatly enhance the efficiency of such e-policies.

The Portugal digital program is the response of the Portuguese government to needs of this type and represents a clear step towards compliance with European Union directives. The main aim of the program is to promote the development of information technologies while improving the partnership between local and central government, citizens and businesses, and increasing the quality of life for citizens. The first experience of the digital cities program in 1999-2000 clearly served to increase and accelerate the diffusion of new technologies throughout the social and economic life of the entire country. The program therefore also aims to extend the beneficial aspects of experience.

In outline terms, the program aims to:

- Increase accessibility to the services of the information society for all citizens and business by setting up free Internet points.
- Adopt telecare techniques to improve diagnostic capabilities and geographical coverage of health services;

⁴ National Communication Authority on the basis of Eurostat data (source: Pocket book 2002).

⁵ This box is based on the presentation by Francisco Jaime Quesado (POSI Manager) during the "On line Citizenship" Conference. The talk can be consulted on http://it.sun.com/eventi/on_line_citizenship. Further information is available on the POSI project Website at <http://www.posi.pcm.gov.pt/> and <http://www.e-u.pt>.

- Modernize the economic fabric by sustaining the growth in competitiveness of Portuguese companies and by generating new demand for highly qualified jobs;
- Support the participation of citizens with special needs in the information society;
- Start the transformation of Portugal into a Wireless Nation. The program is being developed through several projects, including:
- POSI project;
- e-University project.

The POSI (Operational Information Society Program) project

POSI aims to implement the directives of the eEurope 2005 plan. The Portuguese government has decided to create 26 digital regions, by implementing a local government strategy for the 250 municipalities involved:

- Regional virtual communities. Modernizing public services of local authorities, in particular in reference to the adoption of electronic means to increase relations between local and central administrations, by replacing paper-based document and administrative processes with e-documents and automatic processes;
- E-marketplaces for industry. Modernizing the economic fabric by supporting companies while increasing their competitiveness and by creating renewed demand of highly qualified jobs;
- E-health project. Adopting tele-medicine techniques to improve diagnostic capabilities and geographical coverage of health services;
- On line bookings for the tourism industry;
- Regional information. This strategy aims at providing information on a regional basis relative to topics of public interest, culture, and public services through IT communication platforms and Web portals;
- Promoting mobility. This strategy aims at facilitating mobility of skills and professional competences from region to region on a national level;
- Job searching;
- Universities and companies. The aim of the strategy is to improve the performance of the education system by establishing a link between schools and the Science, Technology and Society Network (RCTS), by creating networks of excellence of universities and polytechnics and private research institutes and training centers;
- E-learning. To create didactic contents supported by multidisciplinary educational programs, also by including cooperation activities among the various stakeholders in the education system;
- To increase access to the information society for all members of society, specifically by setting up Internet points.

- To supporting the participation in the information society of citizens with special needs.

For the development of this project, which started on 9 December 2002, a regional portal will be created promoting 5-star regional products with an umbrella brand, supported by one Regional Manager and one data-center integrating the offices of local operators. The portal will also provide an initial framework for interoperability on the basis of XML⁶ standards for this project. Ten regions are currently engaged in the development of the technological infrastructure based on XML and four of them are using Microsoft's .net platform.

Funding

80% of the required funding will be assured through the Operational Information Society Program, while the applicant institution must provide the remaining 20%. The following table 6.1 shows the financial division of national and European funds:

Table 6-1. Project financing plan

	Total cost	Public Cost	EU funded
1) Portugal Digital	187 644 572.45	183 278 312.95	90 120 795.17
a. Accessibility (FEDER)	106 189 612.48	105 856 277.46	54 025 015.37
b. Content (FEDER)	28 896 201.93	25 919 853.45	13 288 878.34
c. From Digital cities to Digital Portugal (FEDER)	51 953 287.04	50 896 711.04	22 533 919.94
d. Joint training agreement (FSE)	605 471.00	605 471.00	272 981.51

The e-University (Electronic University) project

The e-U project, or virtual campus, was designed to create university services on line, produce and share academic content, and set up university communities.

Students will be able to access classes, R&D articles, student papers, grades, bookshops and academic administrative services on line, as well as the Internet, by using a laptop and from any point within the university campus, through a broadband wireless LAN.

⁶ XML is a markup language for documents containing structured information. Structured information includes both content (words, graphics, etc.) and an indication of what role such content plays (for example, content in a section heading has a different meaning from content in a footnote, which differs in turn from content in a figure caption or in a database table, etc.). Almost all documents are structured to some extent. A markup language is a mechanism that serves to identify structures in a document. The XML specification defines a standard method of adding markup to documents. To appreciate the benefits of XML, it is important to understand that it was created specifically to allow richly structured documents to be used on the Internet.

This project represents a joint effort to develop services, contents, applications and communication infrastructure (both inside and outside the university campus) for students, professors and researchers to facilitate and support the creation and dissemination of knowledge. The basic idea around which the project has developed is that of establishing the university as focal point for creation and diffusion of knowledge through new technologies.

The e-U project will provide all university students with a broad range of services, from document requests, to class papers, grades on line, payment of tuition fees, information exchange platforms, on line bookshops and jobs or internship search facilities. Everything will be available 24 hours a day, 7 days a week, and accessible from any point within the university campus or from any other point through the Internet.

To be able to access the university network and the Internet, in order to use the special advantages of the e-U, students will need a laptop with a wireless LAN card. To allow all students to access the services, the e-U has already entered into agreements with several banks to provide students with facilitated loans to buy a laptop.

The e-U Project is already on track at various universities all over the country. Meanwhile, many other institutions are setting up their own pilot schemes and installing access points to the wireless network. The first universities to take part in the project include:

- University of Aveiro;
- University of Trás-os-Montes and Alto Douro;
- University of Minho;
- Faculty of Engineering of University of Porto;
- University of Coimbra;
- University of Católica Lisboa;
- Technical Institute of the University of Lisboa;
- Polytechnics Institute of Portalegre.

Finally, it is worth noting that the e-U project adopts XML, both to develop XML Web services on the University portals and to transform legacy processes into Web-enabled processes.

2.4 Re-use And Public – Private Partnerships

Interest in re-use is often closely connected with the debate on open source software (see § 3) its perspectives in public administrations. In this context, opening of the source code facilitates re-use of an application to the extent in which it allows users to make modifications without any form of restriction, as does the effective zero-cost of this type of software and the

broad margin of freedom granted to users and developers for the distribution of open license products.

However, the involvement of private operators in the development of potentially reusable applications is fundamental, in terms of quality and quantity. In particular, private enterprises with their structures and skills can play a major role, because of their privileged perspective of IT market dynamics and technological developments. Even proprietary solutions can form the basis for re-use strategies to the extent in which it is possible to define the relative methods and terms, and supply adequate incentives to software houses in terms of revenues and guarantees concerning the intellectual property rights of re-used solutions.

The Liverpool experience is of interest in this context. Liverpool Direct Ltd is the joint venture set up by Liverpool city council and British Telecom⁷ to help Liverpool in its transformation from “seaport to e-port”. The aim of the project is to develop technological infrastructure for e-government in order to increase the social inclusion all segments of the city’s population, in particular special needs groups and individuals facing particular challenges.

The multimillion pound investment made by the council and BT aims at experimenting and developing new technologies to change and improve the distribution of existing services, to activate new services for social inclusion, and to guarantee maximum efficiency, effectiveness and safety for city residents. A number of projects have already been started, and many more are slated to come on stream soon: the desired outcome is an increase in the quality of life for Liverpool residents through the use of ICT.

This joint venture is a case that deserves special consideration by those engaging in partnerships between public administrations and private companies. Based on the treasury taskforce guidance for public finance initiatives, the contract signed by Liverpool city council and BT represents an efficient incentive for both parties. Indeed, in the words of official BT documents concerning the initiative, “risks are allocated rather than shared: Liverpool assumes no direct commercial risks and is not liable for any losses accruing in the event of failure of the projects promoted by the joint venture. And all profits will be shared, which effectively means a reduction in the contract fee to Liverpool and a return to BT” (British Telecom, 2003).

The initiative has already reaped initial acclaim and has registered several important concrete successes, thanks to the positive implementation of systems for tele-medicine and telecare, aimed at guaranteeing care for citizens at risk of exclusion and discrimination. After testing and adopting the telecare solution illustrated in the following summary, the joint venture

⁷ Liverpool Direct Ltd. is 80.1% owned by British Telecom and 19.9% by the Council.

plans to facilitate re-use of the project by offering it for sale to other municipal administrations.

Box 2: Liverpool Direct Ltd.: Telecare Project

The ambitious “from sea port to e- port” vision that heralded a number of initiatives by Liverpool city council and British Telecom through the Liverpool Direct joint venture, is the factor responsible for the birth of the joint venture between British Telecom and the council. Among the various projects launched by Liverpool Direct Ltd, the Telecare initiative is the first consolidated experience that is now ready for sale to other cities and administrations⁸.

Liverpool city council is addressing its technological policy towards the achievement of a high level of social inclusion, with the aim of supporting the all members of society including disadvantaged groups in obtaining full access to services that are capable of producing a tangible increase in the quality of their lives. The massive change currently in progress in the city of Liverpool depends greatly on information and communication technologies, which are seen as the optimal means to achieve these objectives.

Observing at the social background against which the initiative is being developed, it is easy to understand the need for an efficient telecare project. The population of Liverpool is ageing, which means that difficult situation associated with the ageing process will become increasingly relevant over the next few years in terms of the numbers of people affected. The number of residential care homes in Liverpool is insufficient to respond to the requirements of all potentially needy citizens, while the costs of existing facilities are spiraling as the general level of efficiency and the quality of the services they provide are falling.

The key issues are related not only to the situation of residential care facilities. Indeed, many people prefer to live at home and here, from a psychological perspective, the ability to care for them without having to transfer them to specific structures can play a major role in defending the quality of their lives and their health. The conclusion that can be drawn from initial considerations is that caring for needy people at their own homes could bring a major improvement in their resilience in relation to diseases and health problems; on another hand, this strategy could also constitute a

⁸ The box is based on the presentation of Christopher Newby (Executive member of Liverpool city council) during the “On line Citizenship” Conference and on information available on the Websites of British Telecom and Liverpool city council (http://www.liverpool.gov.uk/graphics_version/root/Portal_Site/default.aspx). The presentation can be consulted at http://it.sun.com/eventi/on_line_citizenship.

major opportunity to improve the quality and the efficiency of care homes, which could therefore concentrate on more seriously afflicted persons and emergency situations.

The Telecare project in Liverpool aims to enhance the quality of life of people in difficult situations by delaying their admission to residential care homes, and ensuring they have full access to the assistance they need in emergencies. On the administrative side this allows more rational allocation of the resources of hospitals and care homes, higher quality in their work, and a significant reduction in expense for the city administration.

The entire technological structure is based on a call center set up by BT and the council and operational 24 hours a day, 365 days a year, and on a range of ICT skills currently in the hands of the municipal administration.

The households selected for the experimental phase have been equipped with unobtrusive sensing and signaling technologies. In practical terms these are constituted by a range of intelligent sensors, designed to 'learn' patterns of behavior of home occupants and alert human operators to situations in which these patterns are not respected. The detection of potentially hazardous situations or problems being experienced by the recipient of the service activates a process that ensures immediate support from relatives and caregivers plus the Liverpool Direct call center.

Once the system detects a dangerous situation, it makes a phone call to the person in question in order to gain reassurance that they are well. At the same time an emergency call to the Liverpool Direct call center raises the alarm and allows the center to try to get in contact with the person or to call his or her relatives and careers, and to activate healthcare structures to manage the emergency.

The system can detect several potentially telltale situations of danger including:

- Lack of activity, e.g. failure to rise in the morning;
- Increase in room temperature and bath water temperature;
- Property not securely locked at night;
- Cooker left on;
- Abnormal bath usage;
- Medication reminders.

The system is designed to give not only better care to those in need, but also increased levels of security: sensors and signaling devices detecting potentially dangerous situations such as a window left open or a door opening at an unusual time of night make it possible to provide remote surveillance services.

The system offers several benefits not only for the elderly or disabled people directly concerned but also for relatives and caregivers. The facility of monitoring patterns of behavior means peace of mind for relatives,

neighbors and caregivers. At the same time, the system allows at-risk categories of residents to remain in familiar and comfortable surroundings rather than being hospitalized.

Successful testing in a number of selected households made it possible to fine tune and improve on a system that is now ready for complete implementation as a core feature of the city's e-government plan. Once the system has been adopted and implemented at a significant number of households in the City, it will be rolled out to other administrations, thus constituting an effective way of developing and re-using technologies and an additional revenue stream for both the partners in Liverpool Direct Ltd (the City Council and British Telecom).

3. OPEN SOURCE SOFTWARE: PERSPECTIVES AND EXPERIENCES IN PUBLIC ADMINISTRATIONS

Open source software has rapidly become a major topic in discussions between developers and information systems professionals as well as in the academic, public and political debate, and it increasingly offers an important and viable alternative to proprietary software for information product users. Started as a product for niche markets⁹, it achieved considerable success in qualifying as a strategic factor for the rationalization of information systems, investments and management. Once considered to be software that was unrelated to the market because of the substantial lack of interest among private companies and absence revenues in its development and distribution, it was recently the focal point in competitive strategies of large IT firms such as Sun Microsystems and IBM, which aim to deliver a complex set of services on top of the provision of open source compliant hardware and open source software (see Appendix).

⁹ Mainly in the market for "infrastructure" software, such as Web servers, email systems and the like. The enormous momentum gained by communities of open source developers and the increasing interest by IT firms and users stimulated the birth of a number of development projects aimed at generating desktop applications and office automation suites. Some of the most diffused open source applications in desktop environments are the OpenOffice office suite, the image editing application 'The GIMP', Thunderbird email management systems, and the Mozilla browser. Several thousand projects are in progress in the field of desktop computing: for an exhaustive overview see Open Source Development Network (OSDN, <http://www.osdn.com>) and Freshmeat (<http://freshmeat.net>).

The increasing attention focused on open source software is due to three distinct classes of factors: the success of open source applications such as Linux and Apache Server on the server market; increasing concerns about the effective monopoly exercised by Microsoft on the operating systems and middleware markets; the consciousness that traditional “closed” models of software development are no longer well matched to the increasing complexity of demand from companies, administrations and households (Fuggetta, 2003a, 2003b).

Before proceeding with the analysis of the viability of an information system strategy that relies on open source software, it is useful to give a concise definition of the concept of ‘open source’ and the characteristics that make its development process so innovative. Open source applications are developed, tested, improved and modified freely by users who gather in on line communities and work collectively on the design and production of software modules. These products, once developed and released, can be freely distributed; with virtually no license fees to be paid and no other costs except those related to the actual duplication of the applications (e.g. the cost of the CDs on which they are distributed). Open source licenses force authors and developers to disclose and distribute the source code of their applications in order to allow third party developers and users to access the code and modify it, customize it, and improve it to their own specifications, thereby guaranteeing a fast pace of product innovation and evolution (GITOC-South Africa, 2003; Open Source Initiative, 2003; Fuggetta, 2003b).

The source code of an application is constituted by the code written in high level programming language (for example C++), and it determines how the software works. Proprietary software vendors sell their products in compiled form, i.e. in binary and executable form, in order to keep secret and maintain control over their basic asset: knowledge codified in source code instructions. Diametrically opposite to this system, open source software is based on logic of rapid evolution and innovation due to the facility granted to every user to access the code, analyze it and modify it.

3.1 Free And Open Source Software: A New Model Of Development And Distribution

The starting point of open source as a credible alternative to proprietary software can be identified in the decision by AT&T, in the early 1970s, not to renew the agreement with US universities, which allowed them to use, modify and distribute the Unix operating system freely. In response, Richard Stallman, developer and researcher at the Massachusetts Institute of Technology, created a foundation to support what he called Free Software.

The objective of the Free Software Foundation is to preserve the freedom of users to adopt, modify, and distribute software, which is seen as a particular occurrence of freedom of expression. The initiative started by Stallman soon became a powerful political focus rather than a simple community of professionals, forming the basis of a movement supporting the need to dispense with proprietary licenses on information goods. This opposition against proprietary licenses and exclusive rights for the exploitation of knowledge represented the major factor responsible for the widespread intolerance of software vendors towards the foundation (Fuggetta, 2003b; Open Source Initiative, 2003b).

Although quite radical in its position, the free software philosophy offered several opportunities to redefine the ways in which software is developed and designed, and a number of far-sighted developers (Bruce Perens and Eric Raymond above all) tried to get rid of the anti-commercial impetus in free software to start a more business-oriented and pragmatic initiative (the 'Open Source Initiative'), whose objective is to promote the creation and consolidation of companies specialized in the provision of services for open source applications, in the development of proprietary applications to be bundled with open products (EC, Information society 2003) and in the implementation and personalization of free software. The Open Source Initiative certifies open source products, acts as a link between developer communities and as a promoting agency for open source applications. It drew up a formal definition of open source software that sanctions the conformity of software licenses with the standards of the Initiative (see 'Open source definition' below)¹⁰.

Open source definition (Open Source Initiative, 2003, version 1.9)

The open source definition is the manifesto of the open source initiative and of the open source community worldwide. It establishes several clauses that are to be complied with by developers and distributors of these applications in order to guarantee the continuous improvement of the

¹⁰ The main difference between open source and free software is due to the marked political and ethical implications of the latter compared to the more pragmatic and business-friendly philosophy of the former. Free software does not mean that software must be free in the economic sense, but rather that its licences must preserve the freedom of users to do what they believe is right with the products they own (*free speech and not free beer*, Free Software Foundation, 1998). Open source is defined by the Open Source Initiative as a «marketing program for free software» allowing free software to reach the market and enable possible business initiatives from the exploitation of this type of applications, keeping a low profile on the ethical and political front (Open Source Initiative, 2003a).

application, its compatibility and interoperability with applications based on open standards, and its free circulation. The open source definition¹¹ identifies the fundamental criteria with which software licenses must comply for the underlying software to be defined as open source.

1. Free redistribution. The license shall not restrict any party from selling or giving away the software component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale.
2. Source code. The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost—preferably, downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program. Deliberately obfuscated source code is not allowed. Intermediate forms such as the output of a preprocessor or translator are not allowed.
3. Derived works . The license must allow modifications and derived works, and must allow them to be distributed under the same terms as the license of the original software.
4. Integrity of the author’s source code. The license may restrict source-code from being distributed in modified form only if the license allows the distribution of “patch files” with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.
5. No discrimination against persons or groups. The license must not discriminate against any person or group of persons.
6. No discrimination against fields of endeavor. The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.
7. Distribution of license. The rights attached to the program must apply to all to whom the program is redistributed without the need for execution of an additional license by those parties.
8. License must not be specific to a product. The rights attached to the program must not depend on the program’s being part of a particular

¹¹ Source: Open Source Initiative (2003a), “Open Source Definition”, version 1.9, <http://www.opensource.org>.

software distribution. If the program is extracted from that distribution and used or distributed within the terms of the program's license, all parties to whom the program is redistributed should have the same rights as those that are granted in conjunction with the original software distribution.

9. The license must not restrict other software. The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.
 10. The license must be technology-neutral. No provision of the license may be predicated on any individual technology or style of interface.
-

3.2 The Open Source Development Model

The fundamental idea underlying the open source development model is that an open development process involving a high number of users and developers, and the concurrent possibility of modifying the source code without restraints, allow a higher rate of innovation and increased reliability of applications as opposed to the traditional "closed" model of development, controlled and strictly managed by the proprietary firm and a handful of developers (Raymond, 1997). According to literature and the widespread opinion of practitioners and developers, there are different factors determining the superiority of open applications in terms of quality, reliability and security. First, the openness of the code keeps the door for innovation and evolution wide open, because every time a developer or a user needs to adapt the application to the specific needs of individual practices and contexts, he or she can observe the inner workings of the product, understand the margins for modification, and develop a new feature that can be instantly distributed to the user community thereby leading to early adoption of an improved version of the software. Many open source applications are not the outcome of a design and development effort from scratch, but rather the result of skilled redesign and adaptation of existing applications (Raymond, 1997). In this perspective, the Internet becomes a repository of applications and software libraries able to inspire new projects by developers and users who believe that a particular application, if adequately modified, can provide a valuable answer to their needs.

Second, the openness of the source code dramatically enlarges the pool of intelligence and creative capabilities at the basis of an application, accelerating the developmental process both because more specialized developers work simultaneously on different modules of the software and because a large pool of testers guarantees early identification and correction

of bugs and problems with the code («given enough eyeballs, all bugs are shallow» Raymond, 1997). Once a community engaged on a specific development project reaches an adequate size, it can form an effective innovation circle based on peer reviewing practices: the software modules developed are immediately distributed to the community, which can test them, identify problems, re-develop the code ('release early, release often'). In respect to the traditional closed model, the open source development process does not aim at providing a stable, flawless and reliable version of the application in the long run, instead, it focuses on releasing the code often and early in order to stimulate the attention of developer communities and guarantee continuous evolution and improvement of the application (Lakhani and von Hippel, 2000; von Hippel, 2001).

In brief, the openness of this type of application lies at the core of a distributed innovation effort whose reach is far beyond that of limited groups of "closed source" development teams. This perspective calls for preservation of the freedom of users to distribute and modify the code continuously, and thus also derivative works must be open, in order to guarantee innovative feedback to user and developer communities and to sustain their creative impetus (Open Source Initiative, 2003b; Raymond, 1997; Tuomi, 2003).

3.3 Open Source Software: Advantages

According to the open source initiative, the adoption of free and open applications offers a number of advantages to users, be they private companies, public administrations or individual users: "Open source promotes software reliability and quality by supporting independent peer review and rapid evolution of source code. To be OSI certified the software must be distributed under a license that guarantees the right to read, redistribute, modify, and use the software freely" (Open Source Initiative, 2003a).

This "evolutionary" nature of open applications – that is to say the dramatic increase in the speed of innovation – is opposed to the lengthy development processes typical of the software industry and the limited scope they offer to users and developers outside the industry to take part in the development and improvement of the code. Actually, the opportunity to "look into the code" guarantees a distributed effort in identifying problems and possible solutions, it preserves users' security (users can check for the presence of routines, processes and operations that could threaten their security), it fosters a broad variety of uses, and it facilitates customization and modifications. In short, it dispenses with the need to depend on software vendors.

In detail, the following is a brief list of the advantages for a public administration in adopting open and free software (see Berlecon Research, 2002; Wheeler, 2003).

Stability and reliability of the product: if the application is developed, tested and improved by a large number of users and developers, problems with the code affecting performance and security will be immediately identified and fixed; this is crucial for public administrations whose primary activity is to manage citizens' confidential information and data effectively, rapidly and safely.

Security: Public administrations deal with confidential information regarding citizens. Specifically, they receive, process, transmit, store and use delicate data and personal information for a number of purposes. Open source licenses, forcing developers to keep the source code open, allow IT professionals within public administrations to check for the presence of substantial threats for data security in the code of the applications used, preventing unauthorized access and harmful leakages of information. Proprietary software, distributed in binary compiled form, does not offer this opportunity. In this case it is the producer who assumes total responsibility for solving of security issues. Generally, given the strict control of the development and modification process, these corrections take place more slowly than in the open source model.

Flexibility and customization: the openness of the code allows developers and users to develop specific features and versions of the product, adapting applications to the needs experienced by public administrations in different contexts.

Independence from software vendors: the adoption of proprietary solutions and applications generates lock-in effects because it affects future choices of public administrations in their investments in information systems: if a public administration decides to implement a proprietary solution, in the future it will be forced to purchase compatible products from the same vendor, or it will be obliged to meet substantial costs for integration and problem solving (Shapiro, Varian, 1999). Thus software vendors are able to exclude competitors from the provision of software and solutions to customer they have already served. The lock-in problem has to be considered from two points of view. The first is related to the way in which citizens' money is spent: if a vendor manages to sell a product to an organization it avoids having to face up to competition with other vendors and it will reap higher returns in the future than would be possible in a competitive environment. This means that without lock-in effects, or in a competitive situation, better value would be obtained for citizens' money thanks to the ongoing freedom to purchase the best solution in terms of

quality price ratio. The second point of view is that lock-in effects reduce the speed of innovation adoption in public administrations and can generate adverse selection dynamics: even if the market offers better solutions than those adopted, the administration is prevented from purchasing them because it is tied to proprietary technologies and formats. Situations of this type are likely to slow processes of diffusion of innovation and can even force innovators out of the market.

Cost reduction (TCO: total cost of ownership): even though the adoption of open source software does not come without costs, it offers many opportunities to generate substantial financial savings during the entire lifecycle of the application when compared to the adoption of proprietary solutions. There are no license fees and maintenance and updating costs are often greatly reduced (updates and assistance can be easily found on the Internet free of charge from specialized developer communities) (Wheeler, 2003).

Interoperability: in the present state of the debate on open source software interoperability represents a controversial issue. On the one side, in fact, open applications are completely compliant with the open standards accepted at the international level, such as those on which the entire Internet has been built. On another side, however, open source software is not interoperable with proprietary solutions, which have in many cases become *de facto* standards.

3.4 Critical Issues And Obstacles To The Diffusion Of Open Source

Several critical factors and obstacles affect the diffusion of open source applications in the public administration market.

Weight of the installed base (proprietary solutions and technologies): public administrations developed their information systems primarily by adopting proprietary software. While on the server side open source applications have gained a significant share of the market over the past ten years, on the desktop and on the middleware side proprietary software has long constituted the only viable option for the implementation of complex information systems. Although currently open source applications sufficiently mature to be implemented also on the desktop computing layer, the proprietary installed base, which has become a *de facto* standard over the years (as it is the case for Microsoft Office document formats, which are not compliant with open source operating systems), prevents experimentation with open applications.

Contractual engagements: public administrations usually plan their investments in IT on a long term perspective and they recourse to proprietary

software vendors in order to enter into long term contractual agreements which include not only the provision of applications but also consultancy, assistance, upgrades and integration. Clearly, these contractual arrangements mean that the open source option is not viable, firstly because administrations have already signed contracts of this kind in the vast majority of cases, secondly because, at least initially, open source software was not backed by independent firms specializing in the provision of consultancy and training services. The current situation, in which a number of firms are providing services of this type to organizations and users who have opted for open applications, offers a partial response to the lack of an adequate service market for open source applications.

No guaranteed support: as stated in the previous point, the developer community of a specific application cannot provide adequate services and cannot act as a counterpart able to take charge of the responsibilities connected with the adoption of an application. This situation has thus far represented the most important obstacle to the diffusion of open applications. Currently a number of independent small companies (such as RedHat, SuSe, Caldera, VA Linux) are playing an important role in the service market for open applications, as are several large IT companies such as IBM and Sun Microsystems.

Insufficient variety in the home and office applications market: as stated earlier, open source software suffers from a substantial delay in the entrance into the home and office application markets. While some open applications such as Linux and Apache have reaped high shares in the server and infrastructure markets, alternative products for proprietary applications in the user market did not exist until a few years ago. Currently the situation is very different, with developer communities displaying a concerted effort in the drive to develop user-friendly and accessible desktop applications.

The risk of "closure" of projects: many open source projects experiment a degree of more or less explicit closure of their derivative work. This is not legitimate, according to the open source definition, but it is a tacitly acknowledged practice. For example, while the global community of developers of a particular software engage in the production and diffusion of an application, users adopt it and modify it according to their needs but they are unwilling to return their modifications back to the entire community, thereby slowing, if not halting, the process of innovation diffusion. Udell (2003) underlines that this closure ('all take and no give') could lead to the proliferation of non-compatible standards and versions that would diminish the value of the original application and dry up the innovation potential of developer communities.

3.5 Success Factors And Evaluation Criteria

The adoption of open applications by public administrations as well as private companies should be based exclusively on technical and economic criteria, without any sort of prejudice affecting the decision. The strategic document on the implementation of open source solutions in public administrations drafted by GITOC of South Africa (2003) suggests some fundamental factors that should be taken in consideration when choosing between open or proprietary solutions.

On the first hand, the implementation of software, whether open or not, should produce *value*. Potentially, open source creates value in the form of a) increased efficiency of public administrations' information systems, which can be developed and adapted at low cost, b) substantial financial savings since there is no license fee to pay, and c) a strong stimulus for the local (national or regional) production of applications and solutions. Open source software also delivers "social value" according to the strategic document, inasmuch as it facilitates widespread access to information, in the source code form, and constitutes an important instrument to engender entrepreneurial activities and competences in the IT industry for less developed countries. While these considerations tend to give a positive picture of the option for open solutions, this model is also associated with several downsides that must be taken in consideration. Primarily, these are related to the costs to be borne for professional education and updating, for integration with the installed base and for adaptation: if these costs are higher than those of a proprietary solution, then the latter solution is clearly to be preferred.

To give tangible form to value, two essential conditions must be simultaneously present. The first is the presence of adequate capabilities and competences, inside and outside the organization, to support the implementation of the open application, track and enable the implementation process, and so forth. If the cost of these capabilities and competences, be they external consultants or in-house professionals, is higher than the total cost structure of a proprietary solution, the latter option is to be preferred.

The second condition is the availability of a relevant base of developers dedicated to the improvement and innovation of open software products. Without an adequate number of developers and testers outside the organization working on the continuous improvement of the application, administrations opting for an open application risk adopting a solution that lacks the necessary evolutionary prospects (Moore, 1995; GITOC-South Africa, 2003; Fuggetta, 2003a). For example, the adoption of an open application for business critical activities must follow a careful analysis of the size and capabilities of the supporting communities. If these

communities are small and lack the desired level of sophisticated skills, the administration risks remaining stuck with a solution that will not evolve and adapt to match its future needs.

Open source in Europe: cases of formal recognition and adoption

On the European level, a number of local public administrations, government agencies and the European Commission are increasingly interested in open source software for three reasons. Firstly, open source software could reduce European dependence on US software developers and producers and it could kick-start the growth and consolidation of a European software industry. Secondly, as stated above, open source software is likely to provide increased reliability and security to organizations whose core business is to treat and manage confidential data. Thirdly, national governments as well as the European Commission believe that open applications could improve the quality of public administrations' investments in IT, eliminating dependence on vendors and ensuring the opportunity to obtain the most innovative solutions without being faced with incompatibility problems (Fuggetta, 2003b). Some national governments have pressed this issue beyond mere analysis and started to manage massive migrations from proprietary towards open solutions. The following section contains an overview of the most advanced migration initiatives in Europe.

Germany and Munich. The German national government is highly committed in favoring the wide adoption of open solutions at all levels of public administration. In 2002 the German Bundestag decided formally that starting from 2003 the national government would purchase exclusively open solutions, although continuing to run the installed base of Windows computers (CNIPA¹², 2002). The municipality of Munich planned to accomplish wide-scale migration towards open solutions with the objective of adopting Linux on 14,000 personal computers. The project is still being developed (European Commission - IST 2003a; Munich municipality, 2003).

Spain and Extremadura. In 1999 the Ministry for public administration decided to start a migration from proprietary to open solutions, in particular to the Linux Debian operating system, for all servers in public administrations and for the vast majority of desktop computers (CNIPA, 2002). The Extremadura regional administration installed a modified version of Linux (GNU Linex), on all the computers in regional state schools

¹² *Centro Nazionale per l'Informatica nella Pubblica Amministrazione* (National Center for Information Technologies in the Public Administration), <http://www.cnipa.gov.it>

(European Commission - IST 2003; Extremadura Regional Government, 2003).

France. In 2003 the Ministry for culture and communication completed the migration of its server base towards Linux (400 servers). The final objective of the project is to achieve complete migration (also on the desktop environment) by the end of 2005 (CNIPA, 2002).

Italy. In 2003 a special commission instituted by the MIT conducted an analysis of the current use of open source software in public administrations' information systems, with the aim of providing the national government with a clear picture of which areas of national and local government could exploit the potential of open technologies (Ministro per l'innovazione e le tecnologie, 2003a; 2003b).

Three Roses Project. This project, financed by the European Commission, is a joint initiative managed by three European networks (TeleCities, ELANET, eris@) with the objective of setting up a network of experts and practitioners able to analyze and evaluate the opportunities connected with open source software adoption in order to influence the European policy agenda on these issues (see chapter 2).¹³

3.6 Open Source Software In Local Public Administrations: Two Experiences

Open source software offers many opportunities for the experimentation of innovative solutions in the path towards the development of e-government solutions, in particular because of its reduced costs, high quality and the substantial openness, which makes it highly evolvable and customizable.

Helsinki, with its Kontupiste project, is the first case presented during the open source session of the Venice conference (see box below). Kontupiste is a completely free public Internet access point. It is part of a set of initiatives designed by the municipality of Helsinki to stimulate the economic and social growth of the Kontula suburb through information and communication technology.

¹³ Workshop proceedings and many other documents published by Three Roses members can be downloaded from the initiative's Website at <http://www.prelude-portal.org/3roses/index.php>

Box 3 - Kontupiste - urban culture project – a project of the Helsinki department of culture¹⁴

The Kontupiste project is part of a set of initiatives endorsed and sustained by the Helsinki cultural office. The project is funded by the city of Helsinki, the Uusimaa regional council and the European Union, through the Urban II community support program.

The intended recipients of the activities and initiatives are different categories of citizens. The project is especially aimed at those without any previous experience of computers or other access to the Internet. The target group includes elderly people, children, unemployed persons, and immigrants. In addition, the facility constitutes a hub for young generations of artists, with a strong focus on the opportunity to hybridize the traditional and consolidated “art scene” of the city with the rising culture of multimedia technologies.

As a project oriented towards the revitalization of a declining suburb it is intended to restore safety, wealth and well being to residents. It also stimulates direct communication between the suburb and the city’s administration. Project aims include not only the provision of connectivity and digital services, but also a comprehensive free infrastructure in which citizens can gain familiarity with new technologies, learning how to use them, and producing their own digital and multimedia content. The aggregation of services and facilities is destined to reinforce the digital culture of citizens and their usage of new technology.

The Helsinki department of culture

The department of culture of the city of Helsinki aims to create an environment that supports artists and the dissemination of culture, providing opportunities for people to exploit cultural opportunities in Helsinki.

The duties of the department of culture include:

- making subsidies and grants available to support cultural events and activities;
- developing the city’s culture;
- hiring venues and facilities for cultural events and private functions;
- organizing its own program of cultural events.

The department of culture is supported by:

- The cultural and library committee. The committee, appointed by Helsinki city council, designs the cultural policy framework, makes

¹⁴ The box is based on the presentation held by Egil Silfver on the Open Source session of the “On Line Citizenship” Conference. The presentation is available at http://it.sun.com/eventi/on_line_citizenship.

decisions on grants and subsidies, and directs the work of the department of culture. it is also responsible for bestowing the city of Helsinki's culture award. the Helsinki city library operates under the auspices of the committee.

- The urban culture unit. the urban culture unit supports cultural activity and networking at the local grass-roots level. The aim is to stimulate activities in the suburbs by encouraging cooperation between inhabitants, employee organizations and employers operating in the area.

Kontupiste: provider of computing facilities to the people

Kontupiste is an open service point located in the Kontula shopping center. The main function of Kontupiste is to provide free computer facilities and Internet connection to users in a comfortable and enjoyable environment. It also provides users with the means and incentives to gain familiarity with communication technologies and produce Web content. Kontupiste's eleven computers feature the top-of-the-line Linux desktop environment and open source programs and can be used free of charge.

Kontupiste has been open to the public since December 2002 and has been welcomed by the community: the utilization ratio is over 90%. The computing facilities have proven to be reliable with practically zero downtime. The technology has since been applied also in some public schools and libraries in Helsinki.

The urban culture project: related initiatives

Kontupiste hosts the following related projects:

www.kontu.la – a community portal. The objective of the community portal is to develop an open content management and exchange forum for the Kontula suburb and provide the means for the various projects to network more effectively. The community portal enables the exchange of audio, video, text and comments between communities and user-groups with overlapping interests.

The Kontufestival. The junior football team in Kontula is organizing a large-scale musical and cultural happening in August 2003. The event is developed mainly with voluntary work and in co-operation with local private and public partners.

UrbanTV. The project organizes video shoots, editing, directing and planning courses and produces fictional and documentary videos in cooperation with local people. The videos are shown in Kontupiste and published on the Web pages.

Albums Open (Albumit auki). The albums open project digitizes and collects photos that cannot be found in official historical documents. The personal photos and their stories collected from the local population serves as source for the project. The scanning of photos and documentation is

carried out in cooperation with staff provided by the project. The open photo albums can be browsed on the Web at www.albumit.lasipalatsi.fi

Aula-community. The project is divided up into four operations: radio Kontula produced locally for the Web, monthly art clubs in Kontupiste, a local community currency development, and the RDIF-reader community identification system that keeps users informed of each others' location remotely by using the Web or a mobile phone.

Cultural courses. Among other aspects, the city of Helsinki department of Culture also aims to integrate the artistic process of theatrical productions into school teaching programs. During the courses students follow the work of a selected theatre group and study the themes of plays with special lectures and discussions with the actors, directors and writers.

Kontupiste and open source software

The entire network environment is based on software from the Linux terminal server project and all application software is executed on a Linux Application Server. The system does not call for the installation of software on the terminals. The user interface is KDE3, and applications include the Mozilla open source Web browser and the Open Office open source personal productivity suite. Because of the potentially large number of users, the user database is implemented as an LDAP directory with Open LDAP. The LDAP directory is used both in user authentication and e-mail delivery. E-mail system consists of Exim MTA and IMP3 Web interface. Other software utilized includes:

- Debian GNU/Linux;
- KDE, open source desktop environment;
- LTSP, Linux Terminal Server Project;
- GIMP, the GNU Image Manipulation Program;
- ISC DHCPd;
- Linux kernel routing and firewall.

The entire infrastructure can be set up in two days and its cost is about 10 thousand euro. The factor that supports the ease with which the structure can be set up and its minimal cost is its specific architecture, which is based on the idea of a network in which applications run on a server. In this context, individual workstations are seen as terminals that access resources resident on the network server. This implies low maintenance costs and reduced human resources requirements for management of the center. Users employ the resources provided by Kontupiste to browse the Internet, send and receive e-mail, and even to publish their own personal WebPages. As their experience and familiarity with these technologies grows, more applications and utilities will be provided, in order to satisfy emerging needs and new requests.

The success of Kontupiste and its relatively low costs in terms of investments and personnel to manage it recommended the replication of this initiative in several state schools in the city. The first of these has been in use since March 2003.

Another interesting case of adoption of open source software by a city administration is represented by the municipality of Vienna (see box 5). The city of Vienna participates in the project of the Austrian federal government for the use of open source applications in the public sector, and collaborates with other European cities in the Three Roses project. The experience of the city of Vienna highlights some of the problems that may be faced when implementing open source solutions, in particular in the field of desktop computing.

Box 5 – Vienna municipality, Austria¹⁵

Open source software in the city administration

The Electronic Data Processing (EDP) department in Vienna manages one of the largest computer networks in Europe. It has 450 employees, and its clients are prominently employees in other departments of the city administration. The concept driving all the activities performed by the EDP department is that of supporting the city government structure in restructuring and evolving in order to deliver services to its citizens in an effective and economic manner.

At this point it is useful to give a brief description of the hardware environment of the EDP department to promote understanding of how the introduction of open source software can impact on such an environment: primary resources include one mainframe (IBM OS/390), 3 SAP systems (running under UNIX), about 400 application and file servers (250 under LINUX and FreeBSD, 150 under Windows), 20 Web and Firewall Servers running on LINUX, 300 connected networks throughout the city of Vienna, 14,000 PCs and over 1000 notebooks running Windows '95 or Windows 2000/NT.

This large structure has been involved by the Austrian federal government in a project aimed at analyzing the benefits of introducing open source software both in local and national administrations. The idea behind the project is to build a community of software experts, with particular skills in the area of open source software, to design the possible migration of the

¹⁵ This box is based on the presentation by Erwin Götzl, ICT Strategy and Management Chief Executive Officer of the city of Vienna, to the "On Line Citizenship" Conference. The relative video is available at the Website http://it.sun.com/eventi/on_line_citizenship.

administrative ICT infrastructure towards open technologies and standards in order to achieve high-level results with a more efficient and cost-effective software policy. The basic idea also stresses the need for public administrations, both at the local and national level, to avoid dependence on proprietary software.

One of the main goals of the project is to conduct in-depth analysis of various open source licenses, in particular the GPL license, which could be set as standards at the national level, allowing administrations to swap software products and to share them.

Open source software is already present within the technological infrastructure of the city of Vienna. In the near future the project will be extended to the application of the software in other sectors, as a platform from which many software development projects for public administrations will start and will be managed. In particular, the project will be extended to the computing desktop of the office environment.

Considering the technological architecture supporting the activities of the administration, three different levels can be identified:

- **Server Systems.** There are 250 machines acting as file servers for PCs. They all run Linux and Free BSD Operating systems and use Samba and NFS fileserver software and Apache, GNU and Perl for administration and monitoring purposes.
- **Network – Web systems and applications.** There are firewall and Web servers running Linux and Free BSD, Apache, Open SSL and many other open source products.
- **Software development and tools.** The EDP department uses open system tools such as Apache, Perl, C and Gnu.

Without entering into too much detail, it is clear that, at least at the architectural level, open source is a consolidated reality in the Vienna administration. The experience of the city of Vienna can be considered as a positive case of generalized open software adoption (servers, network management, and the back end). However, the use of these products is not free from flaws and problems, in particular in the application of open source software to the level of desktop computing, including difficulties in their use, problems of integration and interoperability with legacy systems.

The Vienna experience highlights several crucial factors influencing the adoption of open source software on the architectural level and, particularly, on the user level. First of all, commercial software has a broader diffusion than open software and it has become, notably in desktop environments and applications, a de facto standard. This means that it is difficult to impose new open standards without coming to terms with the existence of current standards and designing ways in which to integrate with them.

When it comes to the client side of the system the problems are far more substantial and visible. The question of diffusion exerts a powerful influence not only on the technical level but on a psychological level: many computer users, in public administrations as in private companies and households, are accustomed to proprietary software, the functions of which they rely on for their routine computing activities. This marked presence of proprietary software has locked users into a proprietary software environment that they are unwilling to change, given the perceived learning cost of migration.

On a different level, the transition to open source software calls for skills that are not so readily available in public administrations as they are in private companies: developing open software, adapting and customizing existing software, and integrating proprietary applications with open source solutions requires the availability of a suitable number of skilled ICT technicians.

There is also an economic downside to the adoption of open source software. This is constituted by the existence of contractual agreements with vendors and developers of proprietary software: when designing and developing e-government projects, public administrations are likely to sign long term contracts with vendors, in order to have guaranteed access to support when applications and solutions experience technical problems and to be able to rely on a valuable support in managing the growth of their technological base. As these contracts were entered into in the past, they are difficult to avoid, and it is perhaps not financially viable for administrations to terminate them.

A huge technical problem with this software is represented by the difficulty of integration with legacy systems, which requires skilled personnel and a substantial financial commitment for the development of integration arrangements and architectures. Proprietary software vendors are capable and willing to provide these services in order to sell their products, but this seems not to be the case with open software.

The Vienna experience caused EDP department personnel to develop some guidelines that can be useful in evaluating the opportunity to migrate towards open software solutions. First of all the approach to open source software must be driven by economic and realistic considerations: not every open source solution is a good solution just because it is open. In deciding to implement this kind of software, administrations, as well as private businesses, must evaluate the costs of the operation and the benefits that they can expect to receive. This evaluation must compare not only the total cost of ownership of the solution, but the quality of the application, the support guarantees bundled with the product, the opportunity of expanding the underlying architecture without encountering integration problems. These are only some of the many aspects that must be taken into consideration

when making such a step. One thing must be clear: many commentators and operators in the public and private sector are pushing for the adoption of open source software exclusively on the basis of ideological arguments. But software and technologies are such important matters for administrations and businesses that cannot be evaluated on this basis: there must be a strong and sound economic comparison between alternative solutions, without flaws deriving from ideological factors supporting either case (migration from proprietary software to open software or vice versa).

Given this first *caveat*, the Vienna experience brought the administration to highlight some other important “rules”. The first is that the size of the organization allows administrations to pursue these migration projects: in larger organizations there will be a sufficient number of technical staff to manage such a difficult project. In small organizations it’s hard to find enough resources and time to undertake these changes.

As a general rule, it is necessary to involve those employees that are developing applications and software services in house in the software selection process: given their competence in software development, they can drive the selection towards applications that can be more easily integrated in the technological architecture of the administration.

As a third rule, it is highly recommended to make the developed code public, and to do so as quickly as possible: early public release makes it possible to receive feedback from other programmers and users, or from other administrations, that can suggest ways of solving problems with the application or of improving it.

As a final general orientation, the Vienna experience highlights the importance of skilled human resources in order to enjoy possibility of exploiting the latest advancements in software development and higher problem-solving capabilities. This means not only hiring people with above-average skills and professional experience, but also the constant provision of opportunities for the upgrading of these competences and skills.

4. CONCLUSION

Re-use and open source software are two promising alternatives to traditional approaches to the development of administrative solutions. A large proportion of the original interest in the strategies of re-use and open source applications was triggered by the presumed reduction of investments in technologies and solutions, given to the absence of cost associated with open software and the economy benefits associated with the re-use of existing solutions concerning investments in development plans. In

comparison with proprietary solutions and technologies, it was considered that open and re-used solutions would make it possible to obtain higher returns on investment, thus supporting more efficient use of revenues from citizens (better value for money).

Enthusiasm in relation to the cost factor has been dampened by the discovery that the initial evaluation of the gratuity and convenience of the two options was not reflected by reality.

Initial support for both practices of re-use and open source software, in fact, was based on the assumption that the transfer and implementation of solutions from one context to another involved low costs, which, added to the absence or negligible nature of license fees, would determine a generalized convergence towards these new approaches.

In truth, as shown by the cases described in this chapter, the re-use of an application not always is possible, or inexpensive: often the conditions in which a software or a technology have been planned and developed are not presented in the contexts of re-users, therefore forcing the latter to adapt the software to their own processes or adapt their processes to match the software.

The adoption of open source software, which enjoys substantial leadership in certain segments of the market, is made more expensive in other segments due to the consolidated presence of proprietary applications in the administrations, which impose de-facto standards that are incompatible and difficult to integrate with the open source software except by the allocation of very substantial human and economic resources.

This does not mean that re-use and open software does not have a future in public administrations, on the contrary, there is a prevailing pragmatic attitude that addresses the decisions by taking into account both technical and economic criteria. Compatibility and complementary aspects between traditional and new models seems to be a legitimate requirement, rather than the simple ousting and replacement of either one or the other type of solution.

It seems more important to note that in the European and national institutions and among local organizations the conviction that these approaches offer new spaces of innovation and entrepreneurship to administrations and institutions traditionally excluded from the processes of administrative innovation has been asserted.

Due to their specific nature, re-use and open source solutions depend on the deployment and innovative and experimental skills of a plurality of parties, first and foremost local and city administrations. This is because local and city contexts constitute the places in which problems emerge and where administrations, citizens and enterprises seek new solutions, creating both new software and proposing innovative organizational solutions,

procedures, methods of problem-solving and methods of distribution of added value services.

In this context, the EU and national governments act as enablers of distributed innovation processes that, if adequately coordinated and managed in a proactive and cooperative perspective, will lead to standardization of organizational processes, methods, and service delivery channels, the diffusion of best practices, and the dissemination of innovative knowledge.

Standardization, interoperability, and cooperation among administrations, enabled by open source software and re-use strategies, represent the basic requirements for European citizenship, based on the exercise of citizens' rights in every country of the Union, in a context of rising levels of mobility and exchange and through all types of technological tools.

Chapter 7

E-GOVERNMENT DEVELOPMENTAL GUIDELINES

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1. THE MULTIPLE FACETS OF E-GOVERNMENT

The e-government theme presents numerous different facets. Like the concept of *e-business*, the term *e-government* reflects a shared frame of reference, at the cost, however, of lacking any specific analytical quality. The chapters of the present volume highlight the manner in which e-government constitutes a concise label defining at least four distinct subjects, each of which deserves specific attention¹.

The first topic brought into discussion by the term e-government is that of new systems for the manifestation of consensus and expression of citizens, or the area that is referred to within the field as *e-democracy*. The crisis of representation and legitimization of numerous institutions on a central and local level can be overcome by redesigning the methods and forms with which citizens express their ideas on the topics on the political and administrative agenda. Citizenship moves into the electronic era; the manifestation of interest and opinions takes place on the digital highway; the organization of consensus attempts to exploit the opportunities provided by the Internet. Technology, especially on a local level, offers the perfect tool to revitalize the mesh of relations that the new organization of metropolitan space has seriously threatened.

¹¹ The video of the address by Stefano Micelli to the "On Line Citizenship" Conference is available at http://it.sun.com/eventi/on_line_citizenship

A second topic associated with e-government is that of the rationalization of public administration and its relations with citizens. The introduction of a new generation of technologies (particularly open standard technologies) constitutes a formidable tool for the ordering and rationalization of a bureaucratic machine that is frequently inefficient and hard to decipher by the users of its services. These considerations hold true for both central public administrations and the local authorities on which this book focuses. In this perspective, technology can provide a trigger for a process of internal reorganization of the administrative back office and become the prerequisite for modernization of public organization considered globally. Thanks to the use of the network, the effects of this transformation should be rapidly visible to citizens, who will be given access to a significant proportion of the administrative processes that touch on them directly.

A third viewpoint that enhances the meaning of the expression e-government is linked to the renewal of services and new forms of involvement of citizens. This point is partly connected to the previous two points; its relevance, however, suggests that it should be dealt with separately. The use of network technologies leads to the emergence of new social forces. They allow enhanced consideration of the capability for self-organization of individuals; they also provide access to areas of creative thinking that were unimaginable prior to the diffusion of the Internet. From this standpoint, the net introduces a clear discontinuity in conventional forms of division of labor and distribution of responsibilities between citizens and public administration, traditionally the depository of a large proportion of the prerogatives concerning the design of services.

Linked to this third interpretation of e-government is a fourth stance, which is held especially dear by the European Commission. This is the idea that e-government can become the engine of a new phase of economic development, underpinned by a process of grass-roots diffusion of technology among households. This intervention hypothesis sees the public administration as the primary engine of a process of computer literacy on a wide scale, aimed at the creation of an e-society on which to build the premises for an e-economy with solid foundations.

Each of these four interpretations has been developed in the previous chapters of this work, starting from specific points of view and methods. Experiments currently in progress constitute, in the majority of cases, a sphere of knowledge that is currently still too much in flux to make it possible to focus on the definition of a single analytical framework. Attempting to combine the various conflicting points of view within a single study direction is currently premature and even over-ambitious. Top chefs agree that their best dishes call for separate preparation of each ingredient.

However, there remains an interest in identifying the distinctive cipher of an evolutionary path. So what are we learning from the experiment currently underway? Which are, if any, the general characteristics of a process that has been spawned and is today beginning to display a set of specific characteristics? An answer to these questions comes from the comparison between the “evolutionary trajectory” of e-business (already clearly consolidated) and that of e-government. If we look closely, there are many points of contact between the two phenomena and a correlation may be useful with respect to the planning of new actions to be undertaken, both on a local and a central level. Analogies and differences between e-business and e-government may provide the ideal tool to identify a common backbone, able to support a sensible interpretation of the actions of different operators (companies and administrations) and projects with heterogeneous aims (economic activities and services for citizens). Despite the obvious differences, comparison between the two worlds allows us to learn a significant lesson on the effective impact of new technology on the life of citizens and on the potential of the net to define a new means of interfacing and relating to institutions and the community in general.

2. DIGITAL CITY PROJECTS

We shall start this discussion with a rapid historical analysis – greatly simplified by necessity. We can identify two distinct phases of the use of new technology for the transformation of public administration, referred specifically to local authorities. The model we propose is both historic and logical in its approach.

The first phase of the introduction of network technology in cities started in the mid ‘90s, even though the projects to which many of these initiatives refer are effectively earlier, dating back to the 1980s (A.I.Re.C., 2001). In the middle of the ‘90s the debate in Italy and abroad was mainly centered around the possibility of developing civic networks able to restore quality to the social and political relations existing within the urban territory. The reference experience is that of the US freenets, i.e. groups of citizens who independently created social networks, especially those that were activated with the aid of institutions such as local universities or hospitals. These citizen networks mainly exploited the dynamics of self-organization among individuals that utilized the net to expound and empower civic interests and opinions (Beamish, 1995).

The May 1996 issue of *Wired*² carried an in-depth article describing the potential of these networks to provide answers to several very tangible and frequently serious problems faced by citizens. The article informed the technological community of the case of the Cleveland civic network (supported by Case Western Reserve University), which is based primarily on participation and the sharing of experience. The experience reported in relation to a virtual community of families with Alzheimer sufferers revealed the enormous potential of a network of social relations that, besides offering answers to a series of seemingly insurmountable practical problems, helped create a framework of understanding for the dramatic situations of a large number of people previously struggling alone in a challenging and often alienating social environment. In contrast to the received opinions of the time (still widespread today - especially in Italy) network users were frequently found to be middle-aged or senior citizens, who gained access to the services offered on the civic network by means of a user interface that was light years away, in terms of friendliness, from today's easy access systems to Web portals.

The experience of US civic networks radically influenced the emergence of Italian civic network projects. Initiatives launched in concurrence with the start up of cable infrastructure projects in Italian cities aimed explicitly at rebuilding a network of social and political relations that had been severely compromised by new urban lifestyles. Digital cities are free spaces of interaction, places for political debate, arenas for the exchange of ideas on topics of local and national interest. Of network technologies, the most critical component has been that which is linked to new forms of communication, while the data processing component, and, in particular, the component for redefinition of processes has been relegated to a position of secondary importance (De Cindio, 1999).

It should be noted that this period of collective experimentation coincided in Italy with a reform of the electoral law that served to restore status to the figure of the mayor by means of a direct election process by ballot, and rekindled the political debate on a local level. It was precisely this background that resulted in a perception of cities as an electoral territory for the reorganization of local competences to introduce a form of federalism specifically tailored to match the characteristics of Italian society. In this context, the city constitutes a melting pot for ideas where the debate is less subject to the risk of ideological bias, where the relationships between the electorate and the administrator is closer, and where feelings of belonging and identity are still able to promote a civically minded attitude that is

² <http://www.wired.com/wired/archive/4.05/alzheimer.html?pg=3>

frequently less forthcoming when placed in the framework of a national perspective. All the foregoing factors fostered the promotion of structures and services designed to support citizens, particularly with reference to network access and the reduction of the so-called digital divide.

In this direction, the main Italian initiatives were played out in the cities of Bologna and Milan. In Bologna, thanks to the creative vision and hard work of several councilors, a major plan for universal access to the digital services offered by the city council was launched (see box 1, chapter 4). The *Iperbole* network allowed the aggregation of a large number of citizens, who were able to gain familiarity with the technology thanks to a differentiated and diffused action of the administration focused on these problems. In Milan, the experience of the Rete Civica Milanese (RCM) was based on the idea of active participation in the political debate and the desire to deal with a series of topics on the public agenda through inclusive and explicit discussion (De Cindio et al., 1997; Pilotti, 1996).

The bottom-line assessment of the results obtained by civic networks, including the most innovative systems, continues to be elusive. This said, it should be stressed that these initiatives have supported the emergence of new competences on a metropolitan level for the management of on line content and relations, both in relation to demand and supply.

3. E-GOVERNMENT AS A RATIONALIZATION OF THE BACK OFFICE AND RELATIONS WITH CITIZENS

The establishment of the term ‘e-government’ coincided with the start of a new cycle of technological projects addressed at public administration (Rur, 2002). In the past few years the matters of representation and the manifestation of consensus are no longer at the center of operators’ attention. Technology has become, above all, the instrument used by local and central administration to re-engineer its internal processes and create an innovative form of interaction with citizens. In Italy, the call for proposals of the MIT announced the start of a period of investments focused on a radical review of quality throughout the PA structure through technological innovation. The initiatives and projects promoted, starting from 2001 were built around the common denominator of the desire to improve access to the administration by citizens through the implementation of new management and communication tools. To quote from a slogan that encapsulates the thinking within the Minister: “*dalle code ai click*” (from queues to clicks).

The De Petra and Di Pietro's chapter provides a precise and detailed analysis of the progress made in Italy with the launch of the first call for proposals for e-government, both from a technological angle and in view of institutional changes. The balance is substantially positive, because the funding served to kick-start a creative process on a territorial level that is essential if a truly innovative approach is to be adopted. Analysis of the 134 projects submitted highlights also the diversity, and, in certain cases, the heterogeneity of the initiatives presented and the difficulties implicit in developing common lines of approach to macro-projects on an inter-territorial basis. On the other hand, this variety is an indicator of the freshness of design and the wealth of creative input available at a local level. It also highlights the breadth of proposals and ideas that can emerge from the territory.

The emphasis on innovative solutions at the service of quality and efficiency has shifted the center of debate in a substantial manner. From a proposal of a political nature on an urban and metropolitan scale, e-government has shifted gear to become a priority in the national agenda (see annual reports published by RUR-*Rete Urbana delle Rappresentanze*, Censis and Formez). And not only: the very nature of the innovative path has changed. If during the course of the '90s the figure of the 'proactive citizen' occupied a position at the center of attention, today the problem of technological innovation and modernization of PA is viewed as the core guideline value of the various interventions. Although of course this is not to imply that the citizen has become a secondary consideration in this second phase. Quite the reverse. It appears clear that the selection of projects admitted to funding by the Minister reflected a desire to reward ideas that provide the highest level of empowerment for citizens. However, in this scenario the status of citizens has shifted subtly. They are now no longer the *agents of change*, but rather the *beneficiaries* of the facilities made available by technological innovation.

And this difference is hardly of minor significance. In the initial attempts to transform relations between citizens and administration, efforts were based on the conviction that the reconstruction of a political debate able to make use of the new communication technologies would result in an accelerated process of change on an organizational and administrative level. The individual citizen was perceived as the *active party* to all effects and purposes: in this view, individual planning capabilities, when combined with those of others in the same position, would engender change thanks to the creation of a far greater level of political momentum. The implicit idea underlying many of the projects that characterized the political debate of the 1990s is that the problem of the public administration is linked mainly to the definition of a more interactive type of relationship between citizens and

local administrative bodies. Citizens (who can be likened to the ‘principal’ party to a contract in economic terms) would find in new technologies the ideal method of effective stimulation and supervision of the administration (the ‘agent’), which had displayed reluctance in the past to heed input from a fragmentary and compartmentalized civil society.

With the establishment of the new direction of projects, the citizen tends to gradually assume the title of client in relation to the public administration. The modernization of PA, assured by the large-scale introduction of new technology, is aimed at promoting quality of service, certainty of timeframes, and a far greater level of transparency throughout administrative processes. It is citizens themselves that will be the first to benefit from these improvements. Their active contribution to the success of these initiatives is limited to having to acquire the means to access to the network of public administration services via computer, plus the necessary skills (frequently minimal) needed to utilize the service platforms made available to the public. The party responsible for promoting innovation is the public administration. The PA is the engine of innovation in both organizational and technological terms (fig. 7.1).

Civic Networks	E-government
<ul style="list-style-type: none"> • Bottom-up approaches • Emphasis on participation • PA is the guarantor of access and pluralism of services • Demand is self-organized to define new services on a local level • Citizen viewed as the agent of change 	<ul style="list-style-type: none"> • Top-down approaches • Emphasis on efficiency • PA is oriented towards technological integration • Supply is redesigned to improve the system of services distributed • Citizen viewed as the user of the public service

Figure 7-1. Two approaches to services engineering

It should be added that the need to ensure that these innovative paths are not merely one-off events calls for a structural revision of the back office technological infrastructure legacies of central and local PA. During the early ‘90s private businesses, particularly large size companies, were the champions of integrated resource management systems, and they were involved in re-engineering the entire technological architecture of information systems on the one hand and creating a functional bond between technology and organizational processes on the other. This transformation

contributed to increased performance in technological terms and, in the majority of cases, to the reduction of system management and maintenance costs (Amigoni and Beretta, 1998; Camussone, 2000).

However, an equivalent modernization process has not yet taken place within the public administration structure. Legacy technological systems continue to suffer from the type of limitations that have long afflicted the IT systems of private businesses (numerous dedicated applications for specific functions, high integration costs, difficulty in establishing a uniform level of management of systems). The emphasis placed in this publication on the role of open standards and the topic of re-use of software is tied to the importance that innovative solutions can have in the upgrade process of the technological installed base globally present within the public administration structure.

The initiative launched by the MIT makes it possible to undertake a series of trials designed to assess the potential of new technology as a tool for the rationalization of relations with citizens and foster the emergence of reusable application solutions. The goal, in a medium timeframe, is that of re-proposing technological and organizational best practices that are very different from the best practices that emerge from the pages of empirical works on organizational excellence (which are hard to replicate because they tend to have a high level of idiosyncrasy in respect of the context that generated them) (Davenport and Prusak, 1998). The explicit intention is that of accelerating, as far as possible, the rate of diffusion of effective and functional tools at low cost. This rate will be all the faster the more the back office of public administrations is reorganized around evolved management tools able to interact with information systems and communication technologies in an open standard type logic.

4. THE LESSON OF E-BUSINESS

Previously, we mentioned that an analysis of the similarities and differences with the evolution of e-businesses can help us focus on the nature of the current trends in the design of e-government solutions. The two historic phases identified here effectively refer to two philosophical schools of thought in terms of design. So in what measure is this repositioning of the debate on the topics of the back office and one to one services for citizens congruent with the main indications offered by examining the world of electronic business? Starting from this viewpoint, to arrive at convincing responses it is essential to clarify what is happening to the main successful examples of corporate activity on the Internet.

Attempting to summarize and simplify an enormous variety of cases of excellence, which are frequently very different from one to another, we can state that the success of the net depends on the ability of companies to rely on interaction with users who are able to organize their interaction with the system in an effective manner on an individual or collective basis. The positive results of many Web-based initiatives show how the success of the main Internet phenomena are underpinned by a significant transformation of the relations that once characterized the division of cognitive work between demand and supply: in this case it is the former that gains functions and capabilities with respect to the latter (Hagel and Armstrong, 1997; Hagel and Singer, 1999).

If it is true that the vision of e-business announced by financial analysts of the new economy failed to secure a foothold (Gottardi and Mariotti, 2003; Rullani, 2001), it is also true that radical processes of transformation are characterizing the economic scenario to the benefit of those companies that are able to relate to demand in an innovative manner, focusing on leveraging the potential of individuals and, in particular, virtual communities, construed as parties capable of developing independent competences and innovative drive.

The phenomenon of virtual communities and their implications in terms of the digital economy have been amply anticipated by scientific literature (for an overview see Micelli, 2000). From the mid '90s it became clear that these forms of on line aggregation would be able to play an important role in the definition of new rules of engagement in the competitive game. Now, at a distance of several years, the innovative character of their presence on the market is emerging in a clearly visible manner, as is the impact on the rules that define the nature of the competitive environment. Above all, one clear need that can be identified is that businesses need to invest in technological and management tools that are compatible with a new approach to doing business that must be radically revised and re-defined.

Consumer communities are aggregates of people with shared interest and relations which, thanks to communication over the net, are able to originate a process of collective learning (Rheingold, 1993; Hagel and Armstrong, 1997). And it is precisely thanks to this process of empowerment that demand assumes the ability to relate to supply in an innovative manner. Companies responsible for making *cult* type products (Carmagnola and Ferraresi, 1999) were the first to discover the potential of consumer communities: products having a high level of symbolic content became a subject on which enthusiasts came naturally into contact with each other. For products of this type, the lifespan of iconic significances (and hence the perceived product value) depends largely on the capacity of the supply to engender a form of dialogue that, rather than necessarily seeking to

strengthen the bond between company and consumer, tends to forge ties between individuals themselves. And it is precisely this resource of communication that lies at the basis of the value-creation process of which the companies are aware (Micelli and Prandelli, 2000). For many years Harley Davidson offered a highly characteristic product, the value of which depended largely on the ability to promote the continuation of a legend that is constantly consolidated among motorcycle enthusiasts.

However, this is not merely a matter of brand identity and symbolic values. The process also involves advice, innovative forms of use of the product, and collectively developed forms of intuition that the supply is able to embrace and transform into forms of innovation of both product and process (Von Hippel, 2001). For example, a large number of software houses currently rely on user communities to identify bugs or generate creative input to allow them to fine-tune and expand their applications. This trend is transforming the role of demand, awarding greater power and independence of judgment to individuals. In many sectors characterized by uncompetitive intermediation and service structures, such as the banking or tourism industries for example, significant slices of transactions are gradually migrating towards Web-based providers. Armed with independent know-how and relations (for example on line clubs for the management of financial portfolios), consumers interact with suppliers with new types of requests and with an enhanced ability for judgment and selection.

In certain sectors these consumer aggregations are effectively the *avant garde* of expert user groups who communicate on line to develop shared interests and forge new types of approaches with respect to traditional demand. This is clearly seen in the large number of computer expert communities that frequently engage in experimentation with new technical solutions aimed at coaxing more processing power and speed from existing hardware. In other cases, which are closer to the sensitivity and culture of Italian consumption, this trend concerns far broader sections of the public. This is the case, for example, of the Italian cuisine site at www.cucinait.com, through which several hundred thousand gourmets are actively in contact and the success of which is based on activities in the various discussion *fora*. Of course the topic of cuisine is particularly dear to Italians, and it is precisely around these topics and sensitivities that one of the most dynamic and interesting virtual communities in Italy has developed.

This trend has significant implications, in particular, in those sectors wherein consumers can request a variety of different products that the supply side is unable to identify using traditional sources of forecasting and market analysis. In those contexts in which the demand is more divided and more selective, and in those market segments in which supply is obliged to sustain extremely high costs in order to follow the preferences of end users,

interaction with skilled user communities seems to be more profitable. The reasons for this are primarily of an economic nature. The cost that the supply chain must sustain in order to arrive at an analytical awareness of its consumers is prohibitive. It therefore appears more logical to develop a dialogue with a user community engaged independently in establishing paths of learning and experimentation that can be subsequently exploited by the supply side.

5. INTERNAL REORGANIZATION OR EMPOWERMENT OF CITIZENS?

The two distinct phases of development of e-government described above are characterized by two approaches to problems that are substantially different. In the initial phase of development of the digital city, the topic of technology is closely linked to the possibility of re-designing the organization of society and manifestations of consensus. The magical virtues of the Internet were to re-launch a season of political debate that citizens, isolated, fragmentary, and separated, were no longer able to initiate without new resources in terms of infrastructure and institutional legitimization. These projects started a series of important experiments, the spin-off from which is still visible on a local and national level, especially in reference to the competences and awareness that matured in those years. It was precisely the political commitment of these citizens' networks that hindered the migration towards all-round service environments and towards innovative and original forms of organization of activities of an economic nature.

With the establishment of a new phase of introduction of new technology within the public administration, the level of intervention underwent a radical change. Innovative capabilities and funding were returned to the hands of the institutional party. The basic orientation and the keywords that guide the design process reflect economic priorities of efficiency and quality of service. The supply of innovative technological solutions rediscovered a more familiar language and group of stakeholders – central and local administration – to which it was able to propose infrastructure, software, and services which had already been partly consolidated in the framework of the offering to private enterprise. As already stressed previously, the citizen continues to be at the hub of the attention of the public administration, even though the status has now shifted. From being the proposing parties, able to recover a collective form of creative planning, also without reference to consolidated institutions, citizens reassume their role of clients, end users of the improvement of quality and efficiency of the administrative machine, which has finally been modernized through the adoption of new technology.

From being a bottom-up process, the development of e-government services now returns to the groove of a more structured path of the top-down type, with a consequent centralization of guidance and design functions.

When viewed schematically, the path described above may appear to be a reverse trend with respect to current developments in the most advanced e-business situations. In reality, this return to the theme of efficiency and rationalization is a necessary step within the public administration, especially in local administration structures. The possibility of launching initiatives that are effectively modern, capable of involving citizens in new forms as individuals or as a community, depends on the availability of basic technological resources that are suitably qualified.

This technological upgrade process constituted the absolute priority in the management agenda of large and medium size enterprises during the '90s (Scott Morton, 1991). Companies that have already taken this step of rationalizing their back office structures are now in a position to set down an agenda of actions that are significantly more focused on innovation and experimentation on and with their end users. A large proportion of the problems that the public administration is facing in these years (the definition of standard resource planning applications, the creation of a market of qualified and reliable professional services, the identification of effectively reusable methods of intervention) have already been addressed and, to a large extent, solved in the world of private enterprise. If these conditions are not present, any level of evolutionary advance is destined to failure. Rationalizing resources in the context of the back office also means freeing up design skills and competences that are otherwise tied up.

In this context, the opposition between the two models appears far more fuzzy. The problem is not so much a question of contrasting the two interpretations from an ideological standpoint, but rather that of creating the premises for a process of across the board modernization of the administration and services provided for citizens. In the absence of a coherent and structured set of management tools, organized by dedicated functions of the public administration, it is impossible to imagine long-term development of more highly evolved initiatives able to involve citizens in an innovative (and also economical) form.

At the same time, however, the idea that e-government can be created by a mere technological upgrade of existing processes and technologies would appear to be rather understated. The path of modernization of the public administration must forge ahead towards forms of involvement of citizens on whom the integrating part of the overall quality of service delivered by the administration will depend. That which many businesses consider to be optional (the initiation of consumer communities able to provide constant

feedback and creative input) becomes an absolute necessity for the public administration, determined by exogenous factors that are hard to circumvent.

6. MODELLING OF THE SPACES OF TECHNOLOGICAL INTERVENTION

Can we envisage a developmental path for e-government that heeds the lessons learned by industrial enterprises during the course of the '90s? And in which areas is it possible to predict that the process will produce the most significant results from the standpoint of the organization of services and the level of customer satisfaction? An answer to these questions is urgently needed if the public sector is to be provided with significant indications concerning investment strategies and priorities of action, also on an organizational level.

The creation of a model of the developments in the private sector starts from the consideration that the field of application of new technology has extended greatly over the past few years, to the point that it has made the acronym ICT objectively ambiguous (Micelli, 2000). New technologies are instruments whose field of application is increasingly pervasive, and which have radically diverse implications in terms of organization and management. The re-organization of the registers in public administration is very different (in terms of technological specifications, organizational implications, and impact on citizens) from the re-definition of a process of budget allocation. The facility to collect fines via an Internet portal of a local authority is a very different function compared to the involvement of citizens in the effort to fine-tune social services. This wide range of different situations can no longer be represented by simplified formulae, nor can it be dealt with in the absence of a unified approach, or a path that guides the actions of the public administrator.

An initial attempt at categorization must take account of two variables that qualify the area of technological intervention (see fig. 7.2).

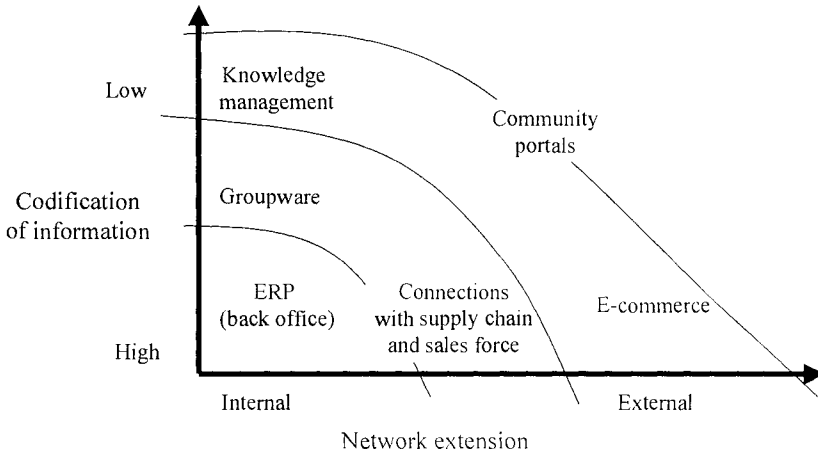


Figure 7-2. Organizational processes and ICT: a technological atlas

An initial variable refers to the level of codification of the information that the administration is required to process. Historically, public administration has focused its efforts on highly codified information (e.g. public registries) that provide a compendium of all the data held by the administration on its citizens. With respect to the British and US tradition, wherein it is citizens who hold the rights of ownership of their personal data, and they grant the public administration permission to process such information, Italian administrators tend to guard their prerogatives more jealously. Data concerning citizens have been the subject of numerous experimental projects over the course of recent years, especially through the use of new media such as new identity cards incorporating various levels of smart logic (see for example the cases of the city card and Siena card, launched respectively by the Parma and Siena council authorities, as described in detail in chapters 4 and 5). As illustrated in previous chapters, these new instruments have long been considered (and are still considered to this day) as the first step towards a new level of involvement of citizens with respect to a new relationship with the public sector.

In effect, however, the information contained in a string of public registry records falls short of constituting all the data needed by the administration. A large proportion of the information on which the life of a municipal administration is based (like the situation within the corporate life of a private business), is not necessarily structured, but frequently consists of details expressed in a descriptive format, which is hard to reconcile with the rigid fields of a classic database. This information has been handled by

private companies by means of various types of projects, which have been labeled broadly in literature under the heading of ‘knowledge management’ (Leonard-Barton, 1995; Davenport and Prusak, 1998; Brown and Duguid, 2000). In reality, a part of these projects can be ascribed to traditional forms of groupware (Orlikowski, 1995), because they are oriented towards the sharing of information and knowledge held within the organization; another part can be defined as more highly evolved forms of ‘document and content management’ (Cohen and Prusak, 2001) aimed at automatic classification and recovery of knowledge whose importance may be underestimated by the same administration (in this direction, we refer you to the experimental project “*Flussi documentali*” [documentary flows] launched by the Municipality of Livorno, discussed in detail in chapter 5, wherein the on line management of administrative documents is integrated with the organization of work flows and the municipal civic network).

As the use of new technologies is gradually focusing on non-structured information, this involves not only a change in the tools, but a radical shift in the type of organizational intervention. The possibility of processing information arriving from multiple sources, frequently with a poor level of internal structuring, cannot be considered separately from an active and aware involvement of the users of the technologies involved. The effective use and the efficiency of these tools depends largely on the implementation of proactive design methods able to collect and use input and design observations provided by the end users of the system (Casapulla et al., 1998).

In many cases, the launch of successful trials in this field depends on the correct identification of ‘practicing communities’ that, apart from sharing common objectives from a professional standpoint, also share a socialized group of professional routines and behavior patterns and a mutual interest in learning (the principle of reciprocity in professional support) (Brown and Duguid, 2000; Wenger, 1998). In public administration, the success of these communities derives mainly from the fact that the rapid organizational transformations that have characterized recent years have questioned the use of traditional instruments for professional updating and training (Costa and Rullani, 1999). Clearly, in the absence of an innovative use of new technology, these professional communities could hardly pretend to assume an important innovative role within the public administration.

A second variable to be held in consideration concerns the extension of the borders of the network with which the public administration interacts. It is widely recognized that the Internet has broken down the traditional barriers between the “inside” and “outside” of an organization, i.e. between the act of management of content and the act of utilization of content (Jones, 1995; Davis and Meyer, 1998). This opening out has led to a radical

transformation in the design of software environments, the definition of parameters concerning security, the re-definition of processes of division of labor, and, today, in the very understanding of products and services. Let us consider the banking service. The opening of on line banks was a technological challenge above all (how to allow users to interact on the platforms without human assistance to perform operations on their accounts in conditions of absolute security); subsequently, an understanding was gained of how it would be possible to achieve cost savings by assigning tasks to the user, for example, such as updating personal data. Increasingly skilled and self-organized users call for innovative products designed for those who have the necessary know-how to interact with financial markets independently. We have recently witnessed the launch of new products designed for users who have acquired familiarity and skills on financial markets (for example, the diffusion of ETFs or 'Exchange traded funds'), which reflect the emergence of a new relationship between the demand and supply of banking services.

The possibility of constituting a direct link between the administration and its citizens has triggered an important process of experimentation on the level of local public authorities in Italy, and, more generally, in the wider European context. Reducing access times to administrative information, increasing the transparency of complex procedures, and opening channels for communications and claims, are among the objectives that have been pursued by local administrations throughout Europe with the intention of re-configuring a frequently difficult relationship with public service users. In Italy, this aim has been pursued with particular determination in order to demonstrate the benefits of the correct utilization of technology in a public context. To repeat a slogan that has already been quoted, more clicks means fewer queues.

It must be emphasized, however, that it is frequently not desirable to place the net ideologically at the service of end users. The experience of private companies testifies to the importance of adopting a gradual approach to creating an opening aimed at qualifying relationships with a series of operators working in close collaboration throughout the entire value system (Rullani, 2001). Before speaking with the end customer it may be helpful to set up a dialogue process with suppliers, professional services, design offices, agents, wholesalers, technical assistance services in the territory, and after-sales services. Linking up this broad range of stakeholders on line means generating significant economies from the management standpoint; it also means building loyalty among a network of partners that contributes, with input and proposals, to optimizing the overall competitiveness of the chain of supply.

Likewise, the public administration, in its diverse articulations, can conceive of a gradual and progressive process of expansion of its network. Until the present, several of the experiments undertaken, especially on a central level have stressed the benefits of a commercial nature that can be obtained by means of an appropriate use of the net. In practical terms, suppliers can be placed on line to arrange bids for tenders in such a way as to obtain the best possible prices for standardized products. In the end, however, it is legitimate to imagine that the administrator follows a path similar to that adopted by many industrial concerns that have engaged in the implementation of an open network not merely to optimize relationships of a commercial nature, but above all in order to compete in view of a process of constant and distributed innovation throughout the chain of value. This progressive expansion can make a significant contribution to multiplying the points of access whereby individual citizens can dialogue with the public administration, facilitating greater visibility of its actions and more localized access with respect to disadvantaged user categories.

7. THREE GUIDELINES FOR ACTION

The combined use of these two variables makes it possible to define an agenda of possible interventions in the area of e-government and, above all, to identify possible courses of development. As mentioned earlier, it appears difficult to implement a processes of rationalization of the so-called back office. Utilizing the categories currently proposed, it is not possible to achieve a substantial upgrade of infrastructure, or solutions and processes that allow rapid rationalization of the management of the codified information that the organization of public administration undertakes to process internally. This said, the potential directions of intervention are multiple. Figure 7.3 provides a graphic view of the design options available to public administrators.

The first variable discussed is shown on the ordinate of the graph, this being the level of codification of the information with which the administration is required to work. A first line of intervention essentially follows this variable. To paraphrase an expression that is currently in vogue among knowledge economy experts, the administrations know more than they think they do³.

³ Thomas H. Davenport, "If Only HP Knew What HP Knows...", *Managing Organizational Knowledge, Perspectives on Business Innovation*, Issue 1. <http://www.businessinnovation.ey.com/journal/loader.html>.

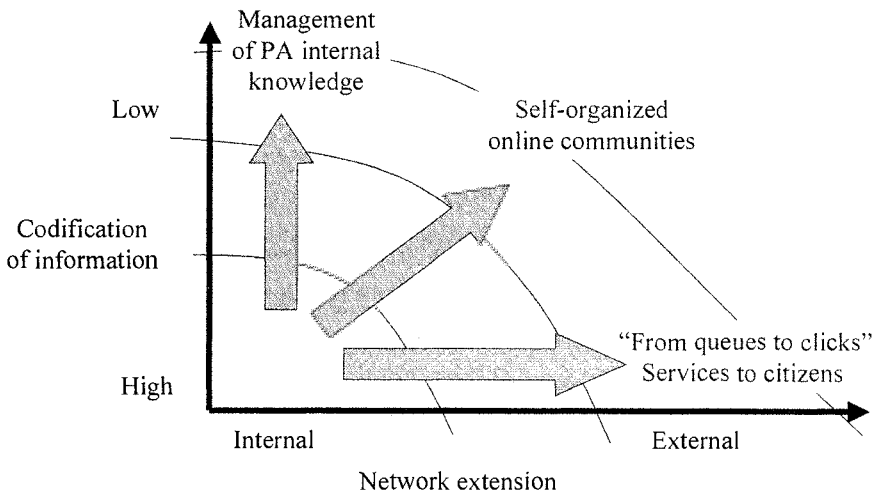


Figure 7-3. Three project development guidelines

One possible line of intervention refers to the possibility of empowering the potential of these resources both by technological leverage and the exploitation of organizational and management aspects. On a national level, the CRC project supported by the DIT, described in chapter 3, constitutes an interesting example of how to reap the value of experiences and knowledge acquired in the framework of the administration in different contexts. Initiatives of promotion of professional communities within the public administration developed by Fornez pursue the same objectives, with a series of innovations with respect to traditional tools of continuous training. The Portuguese “Portugal Digital” project (chapter 6) moves in the same direction; this project pivots around the idea of re-launching and empowering, on a national level, innovative experiences developed in different contexts (telehealthcare, support of competitiveness of businesses through e-business, and e-democracy), thanks to the input of Portuguese universities and local institutions (see e-University project).

A second line of intervention focuses on the second variable discussed, i.e. the level of openness of the net with respect to the stakeholders of the public administration (variable plotted on the abscissa). In this case the administration can take steps to involve the user in a direct form, starting from basic operations. The portals presented in the previous chapters offer many opportunities in this direction. The payment of fines or council taxes – as proposed, for example, by the municipality of Venice by way of a dedicated portal (box 6, chapter 5) – through the use of on line tools, are simple services in terms of process and technology; they imply a minimal

exchange of information, although they can constitute an important starting point in the drive to promote a new form of relationship with citizens.

This type of relationship can also be imagined as being brokered through intermediate institutions that already enjoy a consolidated relationship of trust with citizens. From this standpoint it is of interest to observe the trails started with the lottery operator *Lottomatica* and the *Poste Italiane* postal service to allow access by citizens at service outlets (tobacconists or post offices for example) that are already extremely familiar to the wider public. The benefit, in this case, is that of being able to activate a series of largely accredited operators in the territory and of being able to accompany end users without any particular preoccupations concerning their effective skills and technological abilities. An analogous approach can be found also in other European countries such as Finland, where contact with citizens is sought using a range of instruments and points of access distributed on an urban level (see the case of Tampere in chapter 4, where access to ICT is promoted on a municipal level by means of Cyber cafes run by the local administration, alongside a pervasive network of more than 140 terminals in libraries, care homes, hospitals, etc.).

However, the most interesting area of intervention is in the graphic field, which combines the dimension of less structured knowledge with the capacity to interface with parties external to the administration. This space coincides with the opportunity to set up virtual communities composed of citizens who exchange information, opinions, proposals and feedback on specific themes of interest. The experience of many commercial businesses shows how these communities are capable of promoting new forms of innovation and variety management: it is virtual communities that bring together end users (customers of the company and others) that constitute the most interesting challenge also for the public administration, because the administration has accumulated the most clearly visible time lag in terms of innovation and proximity to citizens. Significant experiments in this direction have already been set up in Italy and other European countries. One successful trial was run in the Polish city of Gdansk (chapter 4), which used the net stressing the communicative and aggregative aspects with respect to the interactive social dynamics that are typical of the communities. With the TIGA project ('Together in Gdansk Again'), the Internet became the infrastructure of choice to bring together the local community and the international community with ties to the city by means of a process of integration and return to their roots.

It should be emphasized that the distances that currently separate administrations and citizens are unlikely to be bridged by the systematic adoption of consolidated marketing tools (analysis of demand, segmentation of users, positioning of services) in view of the reference timeframes and

available resources. It is far more interesting to assess an option that new technologies make possible, i.e. the possibility of defining a new division of labor between demand and supply of public services, especially on a local level; this division of labor empowers the user in a self-organized form and relieves the supply side from the need to anticipate demands that are increasingly exacting and diverse. The following section contains a discussion of the relative implications.

8. PUBLIC ADMINISTRATION BEYOND THE FORDIST PARADIGM

Public administration, particularly local public administration, which is the most exposed to relations with citizens, is currently facing a two-pronged challenge both in Italy and in the rest of Europe. On the one hand it must interact with demands for services made with increasingly high levels of expectations. The global improvement of standards in material life, the innovation that has been shown to be possible in the context of the supply of services, and the level of personalization that can be implemented today within the field of industrial supplies, are all elements that serve to qualify the demand to which the public administration is required to find a response. On the other hand, the resources on which the administration can rely are limited and it seems unlikely that resource funding is set to increase over the next few years. Budget restrictions have become increasingly stringent, and they risk seriously placing in discussion the possibility of 'following up' citizens on the terrain of their specific requirements.

The gap between the evolution of demand, which is increasingly diversified and associated with ever higher expectations, plus the significant reduction in the resources available to the administration to meet the needs of citizens, is penalized by a *modus operandi* that is typical of the administration, reflecting largely all the limitations of large mass production companies (Di Bernardo and Rullani, 1990). The rigidity of the administrative machine, notwithstanding certain important exceptions, still today reproduces a structurally centralized model of innovation that is relatively ill-equipped to exploit the legacy of experience accumulated by operators in the field (those who are interfacing with citizens on a daily basis), and still less well placed to integrate end-users within the process of innovation. The complexity of local society in its various articulations is addressed by means of the replication of an organizational model that maintains design intelligence and resource allocation criteria firmly at the center.

In the private sector, this organizational model has been long outdated, precisely because it has proved unable to respond fittingly to the complexity (variety and changeability) of demand. The criteria for organizational design of companies are increasingly focused on rewarding the contribution of all members of the organization and, above all, on including the end user as far as possible within the process of innovation and development of new products (Von Hippel, 2001; Sproull and Kiesler, 1991). In this context, dialogue with and empowerment of virtual communities constitutes the final stage of a course of evolution that started before the Web reached its current level of diffusion, and that has seen companies focusing on systematically exploiting the know-how of consumers (their opinions of products, their emotional reactions, their proposals), without restricting their activity to acting in relation to a standardized consumer profile (Micelli and Prandelli, 2000).

There can be no doubt that the net represents a phase of discontinuity in this direction: Web access constitutes an invaluable opportunity to accelerate a process of empowerment of demand and its effective involvement in the value system.

In what way do net technologies make it possible to empower the intelligence and powers of citizens (like consumers) in an innovative manner? There are two basic reasons at the basis of the discontinuity generated by the Internet: the first reason is linked to the possibility of *developing innovative communicative geometries* that are very different from the radial networks predicted by the champions of one-to-one marketing techniques. Thanks to the Web, communication flows are not restricted to consolidating relations between organizations and their end users; the net allows individuals to embark on reciprocal relationships through the use of synchronous (Web chats, messenger service) and asynchronous (email, discussion *fora*) communication tools (Hoffman and Novak, 1996). The possibility of creating a network of relations that are independent from the supply side of the chain reduces information asymmetries and shifts a proportion of the capacity for innovation (on a technological level, although *mainly* on the level of the meaning of products and services): people can engage in conversations in which opinions are shared on one product or another, in which modifications and updates are proposed, and the contexts of use of products and services are frequently revised.

The second reason is linked to the new languages that the net promotes. Information technology has long promoted the equation digitalization = codification: in order to digitize content it has thus far proven necessary to codify information through the use of specialized technical languages that are compatible with automated processing techniques. Information technology has facilitated the break down of structured data: the

management of input and output has consequently promoted the creation of a host of technocrats who have overseen the standardization of communication processes to allow the technology to be utilized. The Web introduced several important changes: firstly is the possibility of using natural language and utilizing multimedia formats with increasing regularity (e.g. digital still and video cameras) at extremely low cost. These new opportunities have facilitated the creation of virtual environments in which people enjoy the possibility of exchanging information and knowledge without needing a support staff dedicated to supervising the use of specialized languages. New technologies are no longer the exclusive domain of the organization (as a structured system): they constitute the enabling factor of self-organization and collective learning processes.

If considered and interpreted within a new managerial paradigm, these two factors can constitute a major economic opportunity. Communities are created and grow around new geometries of communication flows that are not necessarily tied to the organization as the pivotal structure, and that exploit new languages that utilize the full potential of multimedia communications. These dynamics point to an independent capacity for learning and development of specific competences from which private companies and public authorities can obtain significant benefits. This approach, however, is only possible on condition that this re-organization of labor processes is not feared as being a loss of control rather than being hailed as an opportunity for renewal of the logic of specialization within the chain of supply. Companies and, to an even greater extent, public administrations, have every interest in empowering the demand side of the system with the facility to develop a proactive approach in which it can engender innovations and proposals, thereby assigning appropriately organized users with the task of defining the specifications of products and services that are otherwise extremely difficult to second-guess and identify. In this context it can be claimed that perhaps the need of public administration to adopt these techniques is even greater than that of private enterprise, since it is today required to carry out an increasing number of functions with limited resources, especially on a local basis.

Is it possible to imagine a re-launch of public administration based solely on technology, without a global rethink of the organizational models underpinning its operation? Can we imagine an evolution of the offering of PA services to deal with the wide diversity of requests from civil society without forging a new type of relationship with citizens? It is hard to imagine that all this could occur in the context of a bureaucratically configured organizational model. It is more probable that a differentiation process can only gain a foothold when the demand side is able to express its own creative input in an uninhibited manner.

9. TWO AREAS OF EXPERIMENTATION TO PROMOTE E-SOCIETY

The potential of an organizational model centered on the capacity of demand to engender dynamic self-organization and innovation varies significantly in relation to the sector of intervention. The preferred arenas of this new organizational model are those where demand appears to be especially fragmented (variety) and where exogenous conditions lead to constant transformations of the habits and the requests of citizens towards the administration (variability). When these two conditions are confirmed, public administration may find it beneficial to shift, at least in part, responsibility for the design of the service to the demand side. In a mirror image situation, the demand side has a vested interest in assuming the responsibility for design to avoid a situation in which the characteristics of specific segments of demand are not taken fully into consideration.

There are two areas of dialogue of particular urgency on which experimentation is to be welcomed in the near future. The first concerns local public services: transport, refuse collection, utilities, and safety are all areas of intervention in which the empowerment of demand can support significant improvements in the quality of the service, with relatively minor costs being transferred to the supply side. In this context we can imagine the organization of specific transport services, targeting users who currently are unable to gain access to urban public transport lines: the net can give these users the facility to self-organize their demand in such a way as to make the provision of the service economically sustainable. Another area of intervention is the quality of the urban waste collection service: through forms of self-organization of demand it is possible to image user groups that no longer restrict their input to reporting inefficiencies in the service or quality shortfalls, but instead propose solutions and corrective measures.

The second area of experimentation is that of local welfare. This label is used to define all those services such as assistance to the elderly, support for families with children, and social services, that are the responsibility of local administrations and on which the quality of life in our cities depends to a great extent. In these contexts, a close relationship with groups of users constitutes a fundamental criterion in maximizing the quality of the service. This is not merely because an efficient service must necessarily be based on an in-depth awareness of the contexts in which recipients live but also, and especially, because the distribution of the service impacts on delicate aspects of the lives of individuals.

A good service is not simply an efficient service, but also a service that takes account of the situation in which the citizens live, and that contributes to generating an understandable view of contexts that are otherwise

potentially problematic. For example, home help for the elderly is not merely a healthcare matter in which the round of visits by specialists must be organized in a rational manner, it also involves the need to deal with situations of discomfort, reconnecting the Web of relations in a local community (see the innovative telecare project promoted in Liverpool through a public-private partnership, chapter 6, in which it has proved possible to manage a remote supervision and safety service through the use of innovative devices installed in the homes of elderly users). Virtual communities can constitute an instrument to promote, on the one side, the capacity for self-organization of demand, and on the other, the lever to reconstruct a communicative context wherein individuals and families in difficult circumstances can find the necessary resources to alleviate problems.

10. TOWARDS A NEW DIGITAL CITIZENSHIP

The start-up of virtual communities in the context of the reorganization of services to citizens recovers the most interesting aspects of the activities of experimentation that were set up during the course of the mid 1990s in numerous cities in Italy and abroad. The identification of the end user as a potentially active party in the design of services, particularly in reference to cities, coincides with the revival of the understanding and development of the fully digital city.

In the same way that companies are discovering, in a more or less aware manner, that they can no longer think of their customers as consumers but rather as social agents to all effects and purposes, also public administrations can no longer think of a generic user group for their services but they are instead called upon to rethink a comprehensive concept of *citizenship*. Unlike the thinking that was reflected in many ideas expressed during the '90s, this 'rediscovery' of the citizen does not seem to be the product of an 'ideological' analysis. This means that it is not mediated by the rediscovery of political debate in the broadest sense. In contrast, it is based on the rediscovery of the *practice of citizenship*; on the systematic sharing of problems and solutions; on overcoming an attitude of pure revendication; on the assumption of responsibilities that derive from a new logic of political interaction and communication (see De Cindio, 1999).

The full range of implications of these transformations on the structure of the administration, and indeed on the orientations of politics, are as yet unclear. These dynamics are currently still in their embryonic stage. In many cities, the distribution of infrastructures and the restricted level of social connectivity are such as to make it impossible to engage in meaningful

experimentations in this direction or to gain a reliable picture of the organizational formulae and competences needed for a new style of public administration. The experience of companies however, marks out a path that the administration is not merely obliged to follow, but indeed to accelerate as far as possible. First of all this is to be achieved through the consolidation of universal conditions of access to the services; subsequently it can be pursued by means of interventions of a more radical nature that facilitate the emergence of new forms of dialogue via the net and new forms of social planning.

There can be no doubt that in the absence of a structured back office and appropriate infrastructure, e-government cannot hope to get off the ground. It is equally true that, without significant drive towards the innovation of organizational and management models, the use of new technology risks propping up a management paradigm that actually urgently needs to be reformed in many of its component parts. The real success of technology will depend to a significant extent on the capacity to interact with these basic elements, focusing on unleashing new forces in civil society and in the urban economy.

Appendix

Open source products and companies¹

Open source software

Operating systems

- Linux: the most used Unix-like operating system. Versions have been run on anything from a handheld computers and regular PCs, to the world's most powerful supercomputers.
- FreeBSD, OpenBSD, and NetBSD (<http://www.freebsd.org>): The BSDs are all based on the Berkeley Systems Distribution of Unix, developed at the University of California, Berkeley. Another BSD based open source project is Darwin, which is the base of Apple's Mac OS X. Many of the router boxes and root DNS servers on the Internet that keep the Internet up and running are based on one of the BSDs or on Linux.

The Internet

- Apache (<http://www.apache.org>), http server, which covers over 50% of the world's Web servers.
- BIND (<http://www.isc.org/product/BIND/>), the software that provides the DNS (domain name service) for the entire Internet. BIND (Berkeley Internet Name Domain) is an implementation of the Domain Name System (DNS) protocols and provides an openly redistributable reference implementation of the major components of the DNS.
- Sendmail (<http://www.sendmail.org>), the most important and widely used email transport software on the Internet.
- Mozilla (<http://www.mozilla.org>), the open source redesign of the Netscape browser, is currently regaining the ground lost by Netscape in the "browser wars". It has quickly moved from version 1.0 to 1.2, adding functionality, stability and cross-platform consistency that is not available from any other browser.

¹ Sources: Open Source Initiative (2003b). www.opensource.org; www.linux.org; www.apache.org; www.isc.org/bind.html; www.isc.org/bind.html; www.gnu.org; www.isc.org/products/DHCP; www.sun.com/software/linux/; www.kde.org; www.openldap.org.

- OpenSSL (<http://www.openssl.org>), is the standard for secure communication (strong encryption) over the Internet.

Programming Tools

- Perl (<http://www.perl.org>), Zope (<http://www.zope.org>), and PHP, are engines behind the “live content” on the World Wide Web.
- Python, Ruby, and Tcl/Tk are high-level languages that owe much of their success and prevalence to the active community of developers that use them and continue their development.
- The GNU compilers and tools (GCC, Make, Autoconf, and Automake, and others) are arguably the most powerful, flexible, and extensible set of compilers in the world. Almost all open source projects use them as their primary development tools.

Other open source products mentioned in the text

- GIMP is the GNU Image Manipulation Program. It is a freely distributed piece of software suitable for such tasks as photo retouching, image composition and image authoring.
- Open Office, multiplatform suite for personal productivity. The suite resembles Microsoft Office and is compatible with the relative MS Office file formats. (<http://www.openoffice.org>)
- KDE is a powerful Open Source graphical desktop environment for Unix workstations. It combines ease of use, advanced functionality, and outstanding graphical design with the technological superiority of the Unix operating system. KDE is a network transparent contemporary desktop environment for UNIX workstations that seeks to fill the need for an easy-to-use desktop for Unix workstations, similar to the desktop environments found under MacOS or Microsoft Windows. (<http://www.kde.org>)
- ISC DHCP. The ISC Dynamic Host Configuration Protocol Distribution provides a freely redistributable reference implementation of all aspects of the DHCP protocol, through a suite of DHCP tools: DHCP server; DHCP client; A DHCP relay agent.
- LDAP. Lightweight Directory Access Protocol. A directory is a specialized database that is optimized for high-speed searches.

Companies Involved in Open Source Software Development and Distribution

- Sun, <http://www.sun.com/software/linux/>
- IBM, Linux Technology Center
- <http://www124.ibm.com/developerworks/oss/linux/>
- Apple, Open Source Initiative, <http://publicsources.apple.com/>
- HP, <http://opensource.hp.com/>
- SGI, <http://www.sgi.com/developers/oss/>
- Cyclades, <http://www.cyclades.com/>
- Red Hat Software, <http://www.redhat.com/>
- ActiveState, <http://www.activestate.com/>
- Covalent Technologies, <http://www.covalent.com/>
- Zope Corporation, <http://www.zope.com/>

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