**Ethiopian TVET-System**

# Health Extension Service

## Level III

| Module Title: | Appling computer and Mobile Health Technology |
|---|---|
| TTLM Code: | HLT HES3 M02 TTLM 0919V1 |

**This module includes the following Learning Guides**

**LG06: IDENTIFY THE EXISTING HEALTH TECHNOLOGIES**

**LG07: Apply the functions of technology**

**LG08: Evaluate new or upgraded technology performance**

| **Instruction Sheet** | **LG06: IDENTIFY THE EXISTING HEALTH TECHNOLOGIES** |
|---|---|

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Introduction to computers operating system
- Internet browsers
- Existing new technology

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Apply the existing knowledge and techniques to technology
- Utilize computer operating systems.
- Open and manipulate Internet browsers to search for, send and receive information
- Identify situations where existing knowledge can be used as the basis for developing new skills.
- Acquire mobile technology skills to enhance learning and provision of standard health care
- Use Mhealth techniques to enhance efficient utilization of resources and avoid duplication of efforts
- Identify, classify and use New and/or upgraded equipment's, where appropriate, for the benefit of customers as well as the health care system

### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4" **in page 9,  and 14** respectively.
4. Accomplish the "Self-check 1, Self-check t 2, and Self-check 3" , **in page 7, 12, and 25** respectively
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3" **in page 27.**
6. Do the "LAP test" **in page 28.**

## 1.1. Introduction to computers operating system

An Operating system is software that creates a relation between the User, Software and Hardware. It is an interface between the all. All the computers need basic software known as an Operating System (OS) to function. The OS acts as an interface between the User, Application Programs, Hardware and the System Peripherals. The OS is the first software to be loaded when a computers starts up. The entire application programs are loaded after the OS. Whenever an application needs information it requests the OS which in turn queries the System clock on the motherboard. User interacts with the computer through the OS then OS interprets inputs given by a user through the Keyboard, Mouse or other input device and takes appropriate actions.

## 1.2. Types of computers operating system

An Operating System can be of Three Types:

Single User   MS-Dos, MS-Win 95-98, Win-ME

Multi User    UNIX, Linux, XENIX

Network       Novel Netware, Win-NT, Win-2000-2003

1. Single User:     If the single user os is loaded in computer's memory; the computer would be able to handle one user at a time.

2. Multi user:      If the multi-user os is loaded in computer's memory; the computer would be able to handle more than one user at a time.

3. Network:  If the network os is loaded in computer's memory; the computer would be able to handle more than one computer at time.

## 1.3. Purpose of computers operating system

**The purpose of the OS** is provided an environment in which the user can execute programs.  The primary goal of an OS is thus to make the computer convenient to use. A secondary goal is to use the computer hardware in an efficient manner."

## Abstract View of Computer System
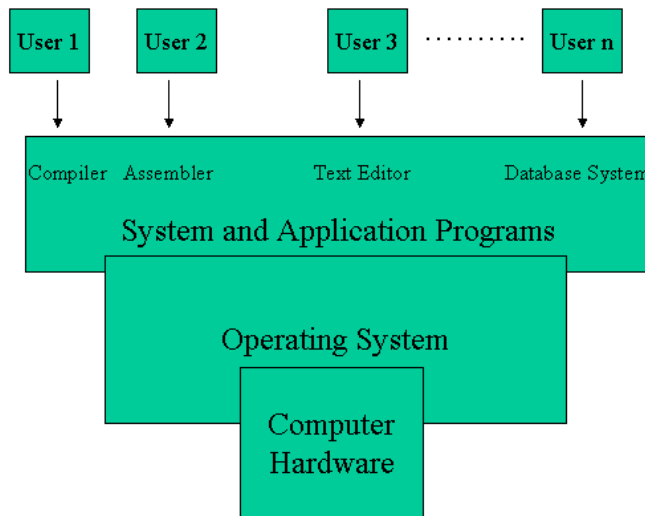### Silberschatz (page 4)



**Figure1. showing abstract view of computer system**

**Computer Hardware** – CPU, memory, I/O devices provide basic computing resources.

**System and Application Programs** – Compilers, database systems, games, business programs, etc. define the ways the computing resources are used to solve the users problems.

**Operating System** – Controls and coordinates the computing resources among the system and application programs for the users.

### 1.4.    Operating System Components
Main components are process, memory, file, I/O system, and secondary storage management.

### 1.5.    Responsibilities of operating system
- Process Management responsibilities.
  - ✓ Creation and Deletion of user and system processes.
  - ✓ Suspension and resumption of processes.
  - ✓ Provision of mechanisms for process synchronization.
  - ✓ Provision of mechanisms for process communication.
  - ✓ Provision of mechanisms for deadlock handling.
- Main Memory Management responsibilities
  - ✓ Keep track of which parts of memory are being used and by what processes.
  - ✓ Decide which processes are to be loaded into memory when memory space becomes available.
  - ✓ Allocate and de-allocate memory as needed.
- File Management responsibilities
  - ✓ Creation and deletion of files.

- ✓ Creation and deletion of directories.
- ✓ The support of primitives for manipulating files and directories.
- ✓ Mapping of files onto secondary storage.
- ✓ Backup of files onto stable storage media.
- I/O System Management – hides the peculiarities of specific hardware devices from the user.

| Self-Check -1 | Written Test |
|---------------|--------------|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. A software that creates a relation between the User, Software and Hardware
   a. Operating system   b. application software   c. utility software
2. If the single user os is loaded in computer's memory; the computer would be able to handle
   a. One user at a time   b. more than one user at a time   c. more than one computer at time   d. none
3. _____not included under computers operating system

   a. Single User   b. Multi User   c. Networked user operating system d. none
4. Main components of operating system include all of the following except
   a. Process and memory   b. file   c. input   output system   D. storage management   E.all
5. Provision of mechanisms for process communication is responsibilities of operating system under
   a. Main Memory Management responsibilities
   b. Process Management responsibilities
   c. File Management responsibilities
   d. I/O System Management

*Note:* **Satisfactory rating - 5 points**     **Unsatisfactory - below 4 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____          Date: _____

**MCH question Questions**

Name:_____          Date:_____

    **1.** _____
    **2.** _____
    **3.** _____
    **4.** _____
    **5.** _____

| Information Sheet-2 | Internet browsers |
|---|---|

### 2.1. Introduction to Internet browsers

The Internet is a worldwide network of computers, and the World Wide Web is the most popular way of using the Internet to organize and link information. The Web uses hypertext to link documents with a graphical "point-and-click" interface. Other ways of using the Internet include e-mail, file transfer protocol (FTP), Telnet, and Usenet.

At the center of the Internet are the servers. Servers are computers that store lots of information for other computers to download and view. When you look at a Web page, you are a client and the computer you look at is the server, sending its Web page to you over a tangle of wires, routers, and switches.

Today's Internet is a web of connectivity including telephone service providers, regional Internet Service Providers (ISPs), local ISPs, and millions of end users who access the information or post sites on the Internet via an ISP. The telephone companies or other large providers sell connectivity.

## 2.2. Concepts in internet browser

- **Browser** *(short for web Browser)* you may get questions about the difference in a web browser and a search engine. A type of software program that allows users to find and connect to Web pages. Two of the most popular browsers are Netscape Navigator and Microsoft Internet Explorer. These allow the user to move back and forth between pages through links.

- **E-mail** *(short for Electronic Mail)* the transmission of messages electronically E-mail can be limited to a single computer system or network, or can allow much broader connectivity. Most e-mail systems allow you to send the same message to one or many people.

- **FTP** *(File Transfer Protocol)* A standard protocol used to send files from one computer to another on the Internet.

- **Home Page** The opening page of either a personal, commercial, or institutional Web site.

**Hot Links** *(or Links)* In hypertext systems, such as the World Wide Web, links allow you to move from one document page to another. When you click a link, you access another Web document.

**Hypertext** A special type of database system in which objects (text, videos, audio, and graphics) is linked to one another. In a hypertext, system movements by the user are not linear or predetermined. Rather movements between objects of various forms are chosen uniquely by the user. For example, while reading a document chronicling the Seattle Mariners 1997 season, a user can click the words Ken Griffey Jr. and retrieve a graph of Junior's batting statistics for the season. The user can then click the link Home

Runs and see a video of Junior's famous swing

**HTML** *(Hypertext Markup Language) Show them HTML source for a webpage. So they can see how complicated it is.* The language used to create a Web document.

**HTTP** *(Hypertext Transfer Protocol)* An agreed upon format (protocol) used on the World Wide Web to retrieve HTML documents. Also the first part of many URLs.

**Internet** A global "network of networks" connecting more than 1 million computers and supporting more than 58 million computer users worldwide

**ISP** *(Internet Service Provider)* An ISP is a company or organization that provides Internet access to individuals and institutions, usually for a fee. The service provider gives you a software package, user name, password, and access phone number. With a modem, a user can log on, browse the World Wide Web, and communicate with others through Usenet and e-mail.

**Modem** *(Acronym for Modulator-Demodulator)* A modem is a device attached to a computer or a program within the computer that allows the computer to transmit data over a phone line. Computer information is stored digitally while information transmitted over the phone line is sent in the form of analog waves. The modem converts from digital to analog when information is sent and from analog to digital when information is received.

**Online Services** A business that provides its users with a wide variety of access to data transmitted over the phone lines. These service providers create an infrastructure with which a large number of users can communicate with one another via e-mail, chat groups, and access to the World Wide Web. Three of the largest online services are American Online, Compuserve, and Microsoft Network (MSN).

**Search Engine:-** A tool to find documents on the Web. At great speeds, the search engine will search through millions of Web pages and select those with specific words and phrases as chosen by rhea user. Popular search engines include Aha Vista, Excite, InfoSeek, and Harbor.

**URL** *(Universal Resource Locator)* A document address. For example: http://www.techresource.org. The URL tells the computer how and where to look for a document

## 2.3. The purpose of web browser?

- Web browser is used to run the software application that allows retrieving, presenting and traversing the information from one place to another.
- Web browser provides the resources using the WWW (World Wide Web) this can be identified by URI (Uniform Resource Identifier).
- Web browser fetches the data like web page, image, video or other piece of content from the server and displays it accordingly.
- Web browser uses hyperlinks to display the resources and allow the users to navigate their browsers according to the resources.
- Web browser defines the application software that is designed for the user to access and retrieve the documents using the Internet.

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. A type of software program that allows users to find and connect to Web pages is
   a. *web Browser*          b. Electronic Mail(E-mail)          c.     FTP     *(File Transfer Protocol)    d. all*

2. _____ is at the center of internet sending its Web page to you over a tangle of wires, routers, and switches.

   a. Server          b. network          c. client computer          d. all

3. _____ is a standard protocol used to send files from one computer to another on the Internet

   a. Home page          b. Hot links          c. FTP(file transfer protocol)          d. all

4. _____ is a company or organization that provides Internet access to individuals and institutions, usually for a fee

   a. Internet          b. Modem          c. **ISP** *(Internet Service Provider)* *d.* Hot links

5. Web browser is used for the following purposes except

   a. to run the software application that allows retrieving, presenting and traversing the information from one place to another

   b. do not allow the users to navigate their browsers according to the resources.

   c. Provides the resources using the WWW (World Wide Web) this can be identified by URI (Uniform Resource Identifier).

   d. Fetches the data like web page, image, video or other piece of content from the server and displays it accordingly.

*Note:* **Satisfactory rating - 5 points          Unsatisfactory - below 4 points**

**Answer Sheet**

Name: _____     Date: _____

**MCH question Questions**

Name: _____     Date:_____

1. _____
2. _____
3. _____
4. _____
5. _____

| Information Sheet-3 | 1. Existing new technology |
|---|---|

## 3.1. Ehealth as existing new technology in health care

Ethiopia is at a pivotal moment in its efforts to improve the health status of its people and address health inequities. As the country has made progress in reaching the health-related Millennium Development Goals, the government realizes that these advances need to be accelerated if targets in the areas of maternal and child mortality and infectious diseases are to be achieved. eHealth is one potential existing new technology in Ethiopia to keep this progress.

eHealth generally is defined as the use of ICT for health and in a broader sense the World Health Organization (WHO) defines eHealth as "a method concerned with improving the flow of information, through electronic means, to support the delivery of health services and the management of health systems".

For national healthcare systems it is used to improve the timeliness and accuracy of public health data reporting and to facilitate disease monitoring and surveillance activities as well as supporting sector-wide planning by improving the ability to plan, budget and deliver services.

## 3.2. Situations to use new technologies

The use of information and communication technology (ICT) to support healthcare services is rapidly increasing. Public healthcare organizations, in most developing countries, are becoming increasingly reliant upon ICT to support healthcare services by improving the ability to collect, manage, analyze and report information in all areas of healthcare.

## 3.3. Types of ehealth and mhealth latest technologies

Some of the latest e-health and mhealth technologies available are IVR, e-HMIS/DHIS, EMR TenaCare, Online Training and referral linkages

### 3.3.1. Interactive Voice Response System (IVRS)

is a technology that automates interactions with telephone callers and communication systems, it allows efficient exchange of information to or from a database.

**How Interactive Voice Response System Works**

The technology uses automated interactions with telephones using pre-recorded voice prompts and menus and the touch-tone keypad. (DTMF), advancement in technology has made it possible to also use of voice recognition to get input responses from spoken word.

IVRS can be applied in the following aspects of healthcare - Chronic Disease Management (CDM). Diabetics: Low income, ethnically diverse. Hypertension, mental health, heart failure, support for smoking cessation.

- Medical Management (MM) .Oral Anti-coagulation. Medical support & refill compliance
- Special Populations (SP) .Nicotine and EOTH usage issues .Cervical Cancer
Screenings. Depression Self Help - General Uses (GU) .Questionnaires and Surveys
.Satisfaction with treatment. Post discharge patient safety and follow-up .Outcomes
monitoring .Collection of race and ethnicity data. Care coordination & home monitoring

### 3.3.2. e-HMIS/DHIS2

Electronic Health Management Information System / Integrated Disease Surveillance
System (eHMIS/PHEM) is an electronic system designed and developed to automate
the Ethiopian paper-based HMIS and disease surveillance systems. The eHMIS/PHEM
application software has integrated data entry interfaces , databases & other features
for both HMIS and disease surveillance system. It is developed and implemented
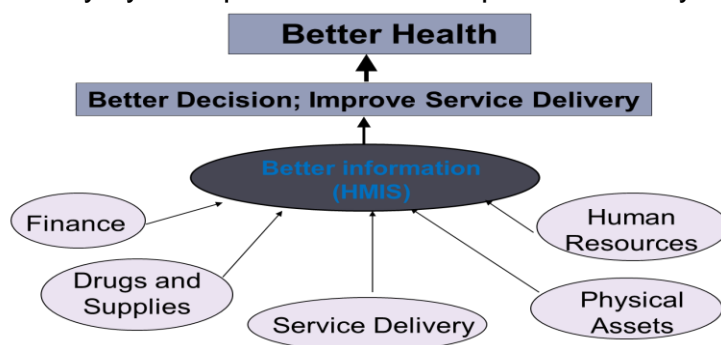entirely by Ethiopians for the Ethiopians health system.



## Fig 2 the diagram showing the component package of e-HMIS/DHIS2

District Health Information System (DHIS 2) is a system/tool for collection, validation,
analysis, and presentation of aggregate statistical data .It is an integrated system of
tools that help operators and planners to collect, collate and USE health data and
information for progressive action.  It is a platform and database independent open
source tool. It is a generic tool that can be easily customized to fit to any field that is
dependent on data collected and analyzed for decision making. It has a flexible user
interface and provides easy access for planners, managers and monitoring and
evaluation specialists to design the 'meta-data' needed to collect important data.

### 3.3.3. Electronic Health Record (TenaCare)

The term Electronic Health Record is widely used in many countries with variation in
definitions and the extent of coverage. In today's environment it is generally accepted
as a longitudinal health record with entries by healthcare practitioners in multiple sites
where care is provided. A longitudinal patient record contains records from different
encounters of care, providers, and facilities that are linked to form a view, over time, of a
patient's health care encounters.
**The Electronic Health Record:**

✓ Contains all personal health information belonging to an individual.

- ✓ Is entered and accessed electronically by healthcare providers over the person's lifetime; and
- ✓ Extends beyond acute inpatient situations including all ambulatory care settings at which the patient receives care.

**Components of electronic health record system**

There are many types of electronic health record systems used in healthcare facilities. However, in all EHR systems, there are two major components of the system: Administrative and clinical applications. The administrative modules support patient registration, scheduling/ appointment, admission /discharge, financial and other management processes whereas, the clinical modules enable the users to collect store and display clinical information related to preventive and curative healthcare services.

**Benefits of EMR**

EMRs can help streamline current procedures and assist with reducing medical error, improving office efficiency, and improving documentation. They can also facilitate techniques, such as patient-populations comparisons, which would be difficult using hardcopy based record systems.  Potential benefits gained from the implementation and use of an EMR may be summarized into four categories:

**Examples of electronic health record**

SmartCare is a computerized electronic health record system used to record/store, process, retrieve and report patient's health information. The system is developed based on the new HMIS implementation. This computerized health record system has different components (modules) that includes: registration module, OPD module, Inpatient module, Tuberculosis module, Paediatrics module, HIV/AIDS module, ANC module, Postpartum module, Labour Delivery module, Pharmacy module, Drug Stock control, Laboratory module, Finance module and  also eHMIS used to pool all data elements of the health management information system from the Smart Care server that is entered by all the different clinics and generate monthly, quarterly, annual reports.

### 3.3.4.      Online training

Training is the giving of information and knowledge, through speech, the written word or other methods of demonstration in a manner that instructs the trainee. Training usually means the act of being prepared for something, of being taught or learning a particular skill and practicing it until the required standard is reached. This has obvious practical implications for the workplace.

### 3.3.5.      Referral linkages

Referral is a process by which a health worker transfers the responsibility of care temporarily or permanently to another health professional or social worker or to the community in response to its inability or limitation to provide the necessary care. Referral is a two way process and ensures that a continuum of care is maintained to patients or clients. It is done from the community to the primary care health service and to hospitals and within hospitals and vice

versa. It also involves not only direct patient care but support services such as transport and communication.

A referral may be for temporary, permanent or partial transfer of responsibility for the care of a patient. It entails the interrelationships and coordination of patient care services from one health care facility to another. Th e referral process begins by the referring health professional communicating to the receiving health professional or specialist relevant patient information. The receiving health professional communicates back to the referring health professional with information and plan for continuum of care thereby completing the referral process.

Referral can be vertical as in the hierarchical arrangement of the health services from the lower end of the health tier system to the higher ones. It also can be horizontal between similar levels of facilities in the interest of patients for cost, location and other reasons. Referrals can also be diagonal when a lower level health facility directly refers patients to a specialized facility without necessarily passing through the hierarchical system. Referrals can be among public, private, community based and other traditional and alternative medicine practitioners and sometimes social services are also included.

**Referring unit** is a health service organization that initiates the referral process. A facility can be both a referring and receiving unit depending on circumstances.

**Receiving unit** is a health service organization that receives patients or clients from referring units and ensures that required care is given to the client and returns the patient with feedback.

**Rationale for Referrals**

The rational for referrals is the promotion of continuity of services.

**Benefits of a good referral system**

A good referral system increases the efficiency of the health system by maximizing the appropriate use of health care facilities. It strengthens the peripheral health facilities and improves the decision making capacity of professionals at the lower level of the referral network. It also creates opportunities for balanced distribution of funds, services and professionals while at the same time improving the effectiveness of the health system. In addition, a good referral system helps to promote cooperation among primary, secondary and tertiary levels of care.

**Essential elements of a referral system**

- ✓ A group of organizations that in aggregate provide comprehensive health care services in a defined geographic area

- ✓ A unit that coordinates and oversees referral activities

- ✓ Designated referral focal persons at each health facility

- ✓ Directory of services and organizations within a defined territory

✓ Standardized referral format

✓ Feedback loop to track referral

✓ Documentation of referral

**Therefore, a good referral system:**

✓ Will have a defined package of services provided at different levels of care

✓ Encourages an environment in which the core referral hospital is viewed as a community resource

✓ Should be responsive to local situation

✓ Should include a properly functioning communication and transport system

✓ It should also be inclusive of the private sector, non governmental organizations and community based care including social services

**Reasons for Referral**

The criteria for referral should be medical, objective and in the best interest of the patient or client. The following are considered good reasons for referrals:

✓ When a patient needs an expert advice as determined by the attending health professional
✓ When technical examination is required that is not available at the referring facility
✓ When a technical intervention that is beyond the capabilities of the facility is required
✓ When patients require inpatient care that cannot be given at the referring facility
✓ When the referring facility cannot no more accept patients due to shortage of beds and unavailability of professionals
✓ Referrals are also made to the lower level health facilities and community based organizations in the best interest of the patient depending on:

 - The condition of the patient
 - The capacity of the lower level health facility /community based organization
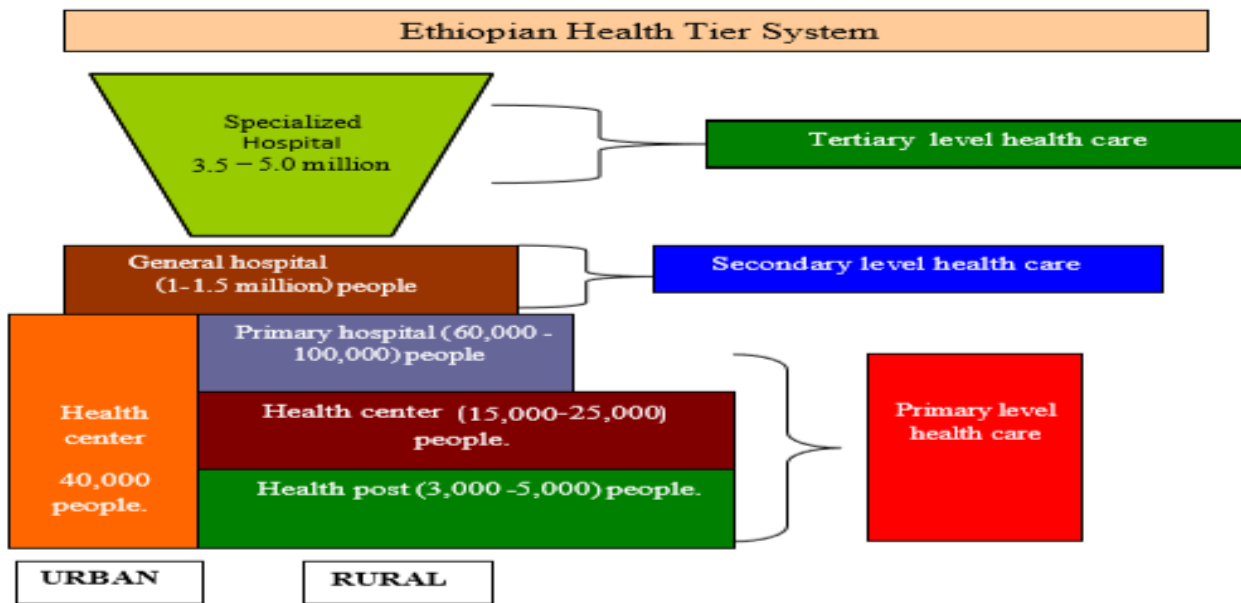
## The New Health Tier System

**fig 3 The New Health Tier System showing reporting relation ship**

**Roles and responsibilities in referral linkage**

1. Roles and responsibilities of the referring health professional
   - ✓ Should know what, whom, when and where to refer
   - ✓ Should fill the referral form with all the necessary information and attach relevant documents
   - ✓ Explains to the patient the rationale, reasons for choice of doctor or facility, preparation, expected cost, and possible outcome of referral
   - ✓ Should be available to answer queries from the referral coordinator or receiving facility about the referral if necessary
   - ✓ Secures result of the referral
2. Roles and responsibilities of the referral coordinator
   - ✓ Responsible for both referrals out and received referrals
   - ✓ Facilitates scheduling based on the level of priority for consultation, i.e. emergency, urgent and routine cases Utilizes the following communication methods: letter, telephone, email, photocopied reports sending, personal contacts, etc.
   - ✓ Ensures the availability of service or professionals at the receiving health facility before referral
   - ✓ Facilitates transportation for emergency cases
3. Roles and responsibilities of the referring facility
   - ✓ Performs a situation analysis regarding the process of referral in the facility
   - ✓ Ensures that staff are well aware of the referral system
   - ✓ Ensures continuous supply of standardized referral forms are available
   - ✓ Keeps directory of health services and facilities in the defined geographic area
   - ✓ Ensures proper recording of all referral activities ☐ Devises mechanisms to track referrals

✓ Provides transportation in emergency conditions ⬜ Assigns referral coordinator with clear roles and responsibilities

4. Roles and responsibilities of receiving health professional
   ✓ Responds promptly to consultation requests
   ✓ Reports in detail all pertinent findings and recommendations to the referring health worker and may outline opinion to the patient (feedback with all required information and recommendation)
   ✓ Communicate with the patient or family
   ✓ Does not attempt by word or deed to undermine the role of the referring health worker

5. Responsibilities of the receiving facility
   ✓ Conducts situation analysis of the current referral process to identify gaps and strengths
   ✓ Assigns referral coordinator with clear roles and responsibilities
   ✓ Devises follow up plans and ensures the plans are communicated to the referring facility /professional
   ✓ Ensures staff at points of entry clearly understand the referral process
   ✓ Provides continuing education about the referral process to staff and the community
   ✓ Ensures referred patients are seen by appropriate professionals
   ✓ All investigations and documents attached with the referral form from the referring facility should be considered to protect patients from unnecessary cost
   ✓ Ensures that all prescheduled referrals are attended without undue delay

### 3.3.6.    Mobile health technology

mHealth or mobile health is a medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices. It involves the use and capitalization on a mobile phone's core utility of voice and short messaging service (SMS) as well as more complex functionalities and applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology.

The goal of mhealth is to improve the delivery of healthcare through quality and access, Care-coordination, Lower rehospitalizations, Improve outcomes, Lower infection rates and Monitor patient status in real time.

**Fig 4 showing types of mhealth technologies**

Tablets

Maximize portable technology in the patient encounter by supporting Point of Care documentation, Real-time care coordination, Labs & Imaging, Patient education, Therapy benefits, Access to past medical history and Countless additional benefits



**Fig 5 showing the role of tablets in health care service delivery**

**Smartphones**

Smartphones are ubiquitous in healthcare and supports Care coordination, External device connection for testing and diagnostics, Blood pressure monitoring, Blood glucose levels and Use of smart apps

**Fig 6 showing the role of smart phone in health care service delivery**

**mHealth Apps**

mHealth Apps have a wide range in scope and includes Online apps or on a device , Health & wellness, Diagnostic and testing, Patient education, Labs & Imaging and Social Media integration



**Fig 7 showing the different kind of mhealth applications in health care service delivery**

**Wearables**

Most popular in the personal fitness space and includes Track and trend activity levels, Sense & analyze information from substances emitted from transdermal source and Use social media to enhance user accountability. "Peer pressure" effect

**Fig 8 showing the role of wearable's technologies in health care service delivery**

**Implantables**

Implantables have been around but are being redefined and used as, Possible vision correction & enhancement , Vital sign or blood glucose monitoring, Relay information back to Nurse Case Managers or Physician and   Lots of diagnostic & monitoring potential



**Fig 9 showing the role of wearable's technologies in health care service delivery**

**Mhealth Includes the use of mobile devices in:**

- Collecting aggregate and patient-level health data
- Providing healthcare information to practitioners, researchers, and patients via Short Message Services (SMS) platforms such as mHero
- Real-time monitoring of patient vital signs and direct provision of care

**mHealth Applications**
- Rapid collection/sharing of current data via mobile phones
- Public health and lifestyle messages over mobile phones
- Medication alerts using mobile phones

- E-prescribing for repeat prescriptions via mobile phones
- Telemonitoring to transmit patient results to clinicians

| Self-Check -3 | Written Test |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. A method concerned with improving the flow of information, through electronic means, to support the delivery of health services and the management of health systems".
   a. Mhealth          b. TeleHealth          c. E-health          d. all
2. One of the following is an example of electronic health record
   a. SmartCare/TenaCare          b. DHIS 2          c. e-HMIS          d. IVR
3. A process by which a health worker transfers the responsibility of care temporarily or permanently to another health professional or social worker or to the community in response to its inability or limitation to provide the necessary care is
   a. Online training          b. referral linkage          c. mhealth (mobile health)
4. Mhealth Includes the use of mobile devices in:
   a. Collecting aggregate and patient-level health data
   b. Providing healthcare information to practitioners, researchers, and patients via Short Message Services (SMS) platforms such as mHero
   c. Real-time monitoring of patient vital signs and direct provision of care
   d. All
5. _____ not Roles and responsibilities of the referring health professional in referral system
   a. Should know what, whom, when and where to refer
   b. Should fill the referral form with all the necessary information and attach relevant documents
   c. Secures result of the referral
   d. None

**Answer Sheet**

Score = _____

Rating: _____

Name: _____     Date: _____

**MCH question Questions**

Name:_____     Date:_____

**1.** _____
**2.** _____
**3.** _____
**4.** _____
**5.** _____

| Operation Sheet-1 | Techniques of Using Computer Applications |
|---|---|

**Techniques of using computer applications**

**Step 1-** set up your computer

**Step 2-** create a user account

**Step 3-** get familiar with the desktop/access your installed programs and setting

**Step 4-** navigate mouse and use keyboard short cut

**Step 5-** select file and text

**Step 6-** copy and paste

**Step 7-** save and open file

**Step 6-** find and sort your file

| Operation Sheet-2 | • **Techniques of Using softwares** |
|---|---|

**Techniques for using computer software**

**Step 1-** install your first program

**Step 2-** launch some pre-installed application/microsoft office

**Step 3-** create office excel file

**Step 4-** inser some data on ms excel

**Step 5-** perform common calculation on ms excel

**Step 6-** create tables and figures on excel

| Operation Sheet-3 | • **Techniques of Internet use** |
|---|---|

**Techniques for preparing referral**

**Step 1 install antivirus**

**Step 2-** set up a connection

**Step 3-** open a web browser/google crome and firefox

**Step 4-** Consult clients on urgency needs to go to referral services

**Step 5-** brows safely online

**Step 6-** send an email

**Step 7-** down load file

| LAP Test | Practical Demonstration |
|---|---|

Name: _____ Date: _____

Time started: _____ Time finished: _____

**Instructions:** Given necessary templates, tools and materials you are required to perform the following tasks within --- hour.

Task 1. Use Basic Computer Applications

Task 2. Use MS Office Softwares

Task 3. Use Internet

| Instruction Sheet | **LG07. Apply the functions of technology** |
|---|---|

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Mobile/smart phones and tablets
- Functions of technology
- Features of new/ upgraded equipment's
- Online search of information

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Use Mobile/Smart phones and tablets for solving organizational problems
- Apply the functions of technology to assist in solving the health and related data collection, organization, analysis and interpretation.
- Test new or upgraded equipment according to the specification manual.
- Apply features of new or upgraded equipment within the organization
- Access, use and interpret sources of information relating to new or upgraded equipment

### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4,---" **in page ---, ---, --- and ---** respectively.
4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4" ,---" **in page ---, ---, --- and ---** respectively
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 " **in page ---.**
6. Do the "LAP test" **in page – ---**

| Information Sheet-1 | Mobile/smart phones and tablets |
|---|---|

### 1.1. introduction to Mobile/smart phones and tablets

In the past, mobile phones were mostly about making phone calls. They had a number pad, a digital phone book and a pick-up/hang-up button and not much more. Now smart phones offer so much more – they're really fully-fledged computers that you can fit in your pocket. They can run programs and games; access the internet, send email and much more.

Nearly all smart phones now use touch screen controls. Instead of having hardware buttons like before, one side of the phone is taken up mostly by a touch screen that you control using taps and gestures. There aren't even any number buttons; when you want to make a call, a number pad will pop up on the touch screen. Becoming familiar

with a Smartphone can take a little bit of practice. But when you do become familiar with it, you'll find that a Smartphone can do more than you ever thought possible on a mobile phone.

## 1.2. Mobile/smart phones and tablets function

A smart phone can: Make voice calls (of course!) Make video calls Access the internet and browse the web Take photos, and upload them to the web Navigate with GPS if the phone has GPS built-in Play back music and video stored on the phone (and connect to a PC to copy media to it) Manage your contacts and appointments Send emails Play in-built games Run new applications and games downloaded for the internet.

## 1.3. Utilizing mobile phone plans

Many mobile phone plans – pre-paid and post-paid – now include a data component. For example, an Every Day Connect plan from Telstra will also include data as part of the plan. In addition, on many post-paid services you can purchase a data pack as an add-on to your basic mobile plan. The data component of the plan will be limited to a set amount of downloads each month (listed in megabytes/MB or gigabytes/GB). This works very much like your home internet plan. One important thing to note is that on most mobile data plans, you will be charged extra if you go over your limit. So you need to read the mobile agreement carefully and check your usage levels regularly. Many mobile providers also allow casual data usage on a pay-as-you go basis if you don't have an explicit monthly quota on the plan. This is usually charged at a higher rate than if you have a data component built into the plan.

## 1.4. Identifying Phone Model Differences

Just because two phones might run the same operating system, doesn't mean the phones are identical: There are physical differences: the weight  and the screen size There are performance differences: the speed  of the processor and the amount of memory  (much like on computers) There are software differences, with different manufacturers loading different programs  onto phones.

## 1.5. Mobile/smart phones and tablets utilization in health service provision

### 1.5.1. Tablets

Maximize portable technology in the patient encounter by supporting Point of Care documentation, Real-time care coordination, Labs & Imaging, Patient education, Therapy benefits, Access to past medical history and Countless additional benefits

### 1.5.2. Smartphones

Smartphones are ubiquitous in healthcare and supports Care coordination, External device connection for testing and diagnostics, Blood pressure monitoring, Blood glucose levels and Use of smart apps

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Mobile/Smart phones and tablets are used for solving organizational
2. Tablets technology are not applied to assist in solving the health and related data collection, organization, analysis and interpretation.
3. If two phone runs the same operating system then they are identical
4. All mobile phone plan includes a data component
5. Mobile/smart phones and tablets are fully fledge computers

*Note:* **Satisfactory rating - 3 points**          **Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____          Date: _____

**Short Answer Questions**

1.   ___
2.   ___
3.   ___
4.   ___
5.   ___

## 2.1. Introduction to technology

Technology is wide-ranging term used to describe not just the computers you have, but also the software, printers and other devices that you use to support your business. This can also extend to include online services and websites, such as Facebook and YouTube and other application specific websites.

## 2.2. Functions of technology in organizations business

Technology, when used to support business needs, should be considered as an asset to be invested in, not a cost to be borne. When implemented properly, good technology investments result in a measurable return on investment (ROI). That ROI might well be achieved through lower running costs, better productivity, better customer service or simply increased sales due to increased capacity.

When we came to healthcare, healthcare industry is experiencing a steady and stable transformation across the world. And Information Technology (IT) is playing a core role in every aspect of healthcare.
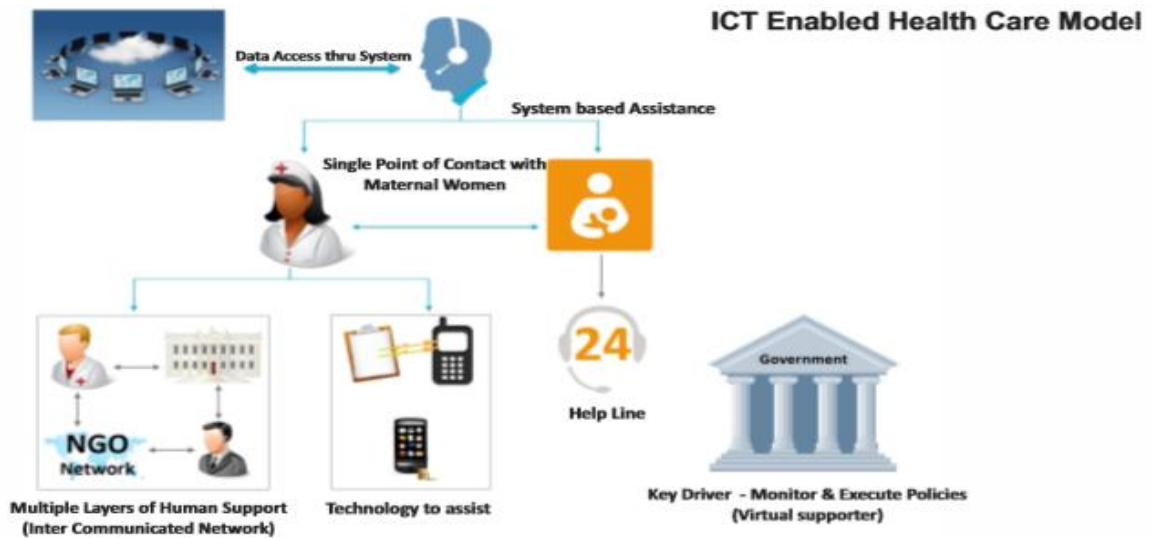


## 2.3. Functions of Information Technology in health care includes

✓ Automated Operations to make monthly calls and feed information to maternal women Seamless interfacing with third-party databases Manage voice recording with ease

✓ Ability to obtain real time and updated information to provide reliable service Improve productivity with comprehensive reports

✓ ensuring faster adaptability of advanced technologies

✓ reduction of service costs and

✓ Provision of quality healthcare at affordable prices.

| Self-Check -2 | True False Questions |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Technology is just the term used to describe the computers you have
2. Face book and You Tube are application Specific websites
3. Technology, when used to support business needs, should be considered as a cost to be borne
4. Information Technology (IT) is playing a core role in every aspect of healthcare
5. Automated Operations to make monthly calls and feed information to maternal women Functions of Information Technology in health care

*Note:* **Satisfactory rating - 3 points        Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____        Date: _____

**Answer Sheet**

1. _____
2. _____
3. _____
4. _____
5. _____

| Information sheet 3 | Features of new/ upgraded equipment's |
|---|---|

## 3.1. Introduction to new/ upgraded equipment's

There are many reasons why you need to continue investing in your technology – and consider regular upgrades and essential part of your strategic toolkit. Here we focus on just some of them. Each of these points will impact individual business in a different manner, and each can play a role in helping you be more efficient and to focus on what is important.

## 3.2. The features of upgraded technologies

The features of upgraded technology are they speed your work load/faster, allow communicating smarter, introducing efficiencies, more secure, evolving and growing with new features, access vendor support, supported when things go wrong, benefit from a current warranty, keep up with business growth and streamline your training.

1.  SPEED UP YOUR WORKLOADS
In this fast-paced world, everyone wants things faster. With technology, it's no different. We have faster CPUs, more processors, faster hard drives, the list goes on. These resources make processing of any given workload also run faster. This translates directly into better productivity for the users, the ability to service more clients. Put simply, older systems simply do not run things as fast as newer systems can do. You might upgrade the software to later versions, but they will typically require more resources (i.e. RAM and CPU) and therefore run slower on older computers, if at all.

2. COMMUNICATE SMARTER
Newer technology helps companies to have greater flexibility when communicating with clients - and higher business potential when doing so. From simple things such as being able to email clients from mobile phones (which was not possible not all that long ago), through to technology that permits integration between business systems and social media.

3. INTRODUCE EFFICIENCIES THROUGH MOBILE WORKING
Simply put, newer technology permits you to do things that you could not previously do. The ability to do stock lookups from your accounting system using a mobile device means a sales rep on the road can quickly take orders, knowing that he can deliver within a specific timeframe. This is just one of many examples of the convenience truly mobile work systems can deliver.

4. FOCUS ON SECURITY
Many people feel that Windows XP may do just fine for their needs, but if it gets hacked… then what is the risk for you and your information? Older systems such as Windows XP are not being actively checked for security vulnerabilities, therefore your information and your customers' information is at risk of being compromised, stolen or even corrupted. Other ageing systems face the same vulnerabilities; the Windows example is just one of many.

## 6. EVOLVE AND GROW WITH NEW FEATURES

Software vendors are taking advantage of features in new operating systems to provide enhancements that are simply not possible in older operating systems. Many older computers now cannot be upgraded to work with the newer operating system – limiting the functionality available to you.

## 6. ACCESS VENDOR SUPPORT

Software vendors are typically only testing their applications on the current version and just-prior version of a given operating system. They simply won't be investing the time in testing on systems that are say 10 years old and, as a result, can't support them if there are issues. In addition, hardware vendors such as HP and Fujitsu do not provide drivers to allow their newer computers to work with older operating systems, resulting in reliability problems with those machines.

## 7. BE WELL SUPPORTED WHEN THINGS GO WRONG

Similar to vendor support, if the technology gets too old, us as IT professionals can't support it. The knowledge we have may be limited and the tips and tricks that used to work with old systems are different to those needed in newer environments. In short – we simply don't know it all, but most IT guys won't tell you that. It can take us time to find answers, which is often linked to higher support costs.

## 8. BENEFIT FROM A CURRENT WARRANTY

While a system is under warranty, if something fails you can quickly get it replaced and up and running again. When it falls out of warranty, you're at the mercy of the vendor and whatever they may have laying around. We've seen systems that are 5+ years old that don't have any warranty or maintenance on them fail and immediately put the business into a disaster recovery situation – having to source a new server and then restore from backups. If the system had maintenance on it, parts would be readily available and fixed within a much shorter timeframe. The business risks often go unnoticed as many people don't monitor warranty expirations.

## 9. KEEP UP WITH BUSINESS GROWTH

Your systems might be designed to support a certain number of people and, over time, you add one more, then one more… and so on. Before long, the system designed to support 5 people is supporting 25 people and has slowed to a crawl. The same limitation can also apply to the number of orders you process, the volume of stock you have on hand, etc. Having systems sized correctly for your business operations has a direct link to the productivity and performance of the technology solution.

## 10. STREAMLINE YOUR TRAINING

Having older systems and technology can be a frustration for new/younger staff who simply doesn't know how to use them. Training up younger staff on how to use older text based systems (as an example) when they are used to the point and click of today's world can be fraught with issues - not only in the time it takes, but also due to the potential for errors during the entire process. Compare Windows XP to Windows 10 as an example of how much things have changed in the last 10 years alone and you get an idea of the challenges faced by some of your younger team members.

| Self-Check -3 | Written Test |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in

the next page:

1. New and upgraded equipment can play a role in helping you be more efficient to focus on what is important.
2. Newer technology helps companies to have greater flexibility when communicating with clients
3. Upgraded technologies are unsecure most of the time
4. The features of upgraded technology are they speed your work load/faster only
5. Vendor supports even an outdated technology

*Note:* **Satisfactory rating - 3 points**          **Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____          Date: _____

**Short Answer Questions**

1. _____

2. _____

3. _____

4. _____

5. _____

## 4.1. Introduction to information searching

Most information is found on the Internet by utilizing search engines. A search engine is a web service that uses web robots to query millions of pages on the Internet and creates an index of those web pages. Internet users can then use these services to find information on the Internet.

If you have a general idea of the subject in which you're interested, but are not sure exactly what you're looking for, a directory is a great place to start.
If you already know exactly what you're looking for, a search engine is the best way to find it. Search engines use keywords or phrases you choose to determine which web pages have relevant information. Think of a search engine as an index for the web.

## 4.2. Way of searching for information online

1. Searching of information by using Directories

Directories like Yahoo! use human editors to organize information in broad categories, such as finance, sports, or travel. Think of them as giant card catalogs. By starting with these categories and then moving down through subcategories, you can narrow your search until you find the information you need.

2. searching of information by choosing keywords

For the best results from a search engine, it's important to choose your keywords wisely. Keep these tips in mind: Try the obvious first. If you're looking for information on Picasso, enter "Picasso" rather than "painters". Use words likely to appear on a site with the information you want. "Luxury hotel Dubuque" gets better results than "really nice places to spend the night in Dubuque". Make keywords as specific to your topic as possible. "Antique       lead soldiers" gets more relevant results than "old metal toys". Use a directory to find keywords related to your topic, and then   enter those words in a search engine.

## 4.3. Reading Search Results

Search engines put the most relevant results first, so if what you want is not in the top listings, try again with more specific keywords. Or, narrow your search by adding more keywords. Google returns only pages containing all the keywords you use, so adding more keywords eliminates less relevant pages. To get more results, use more general keywords or include fewer search terms.

Google's "cached" link shows you a snapshot of a web page so you can see it even if the actual site is not accessible. On cached pages, your keywords are highlighted to

make them easier to find. Seeing where your keywords appear on a web page prior to clicking a result link can save you time. That's why Google displays an excerpt from each returned result page showing your query terms in bold type.

These snippets let you see the context in which your search terms appear on the page, so you can determine if the site is worth visiting. To find more pages like a particular result, click on the "Similar Pages" link. This service automatically scouts the web for pages with content related to the link you select. To begin your search, type www.google.com into your browser's "Address" field and hit enter.
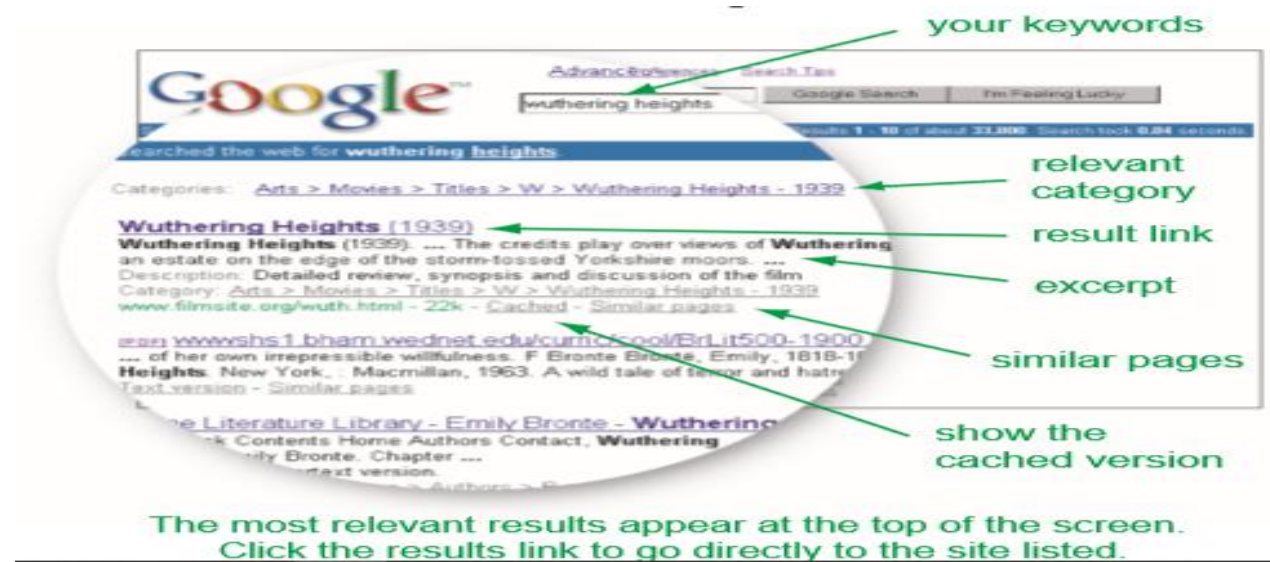


**Figure1. Reading for search information on Google search**

Directories arrange information by topic. Click through categories and subcategories until you find what you want.
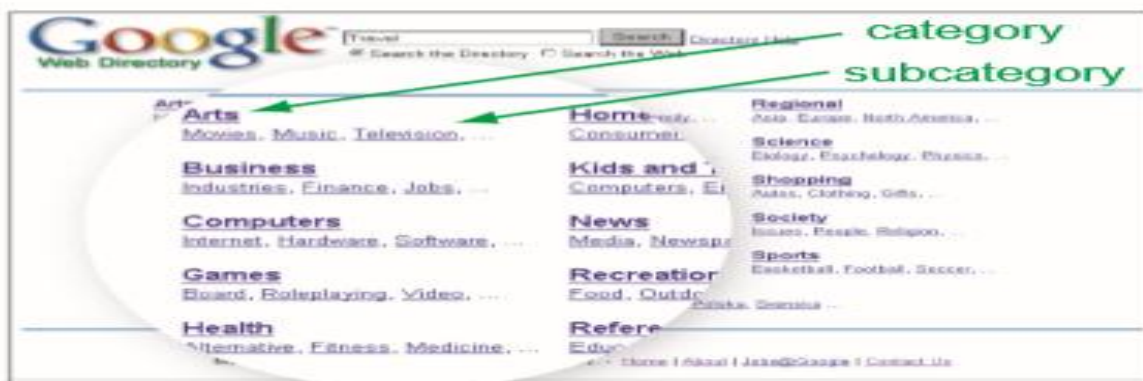
**Figure2. Order of search information on Google search**

Google looks simple, but searches more than a billion pages.  Enter what you're looking for, then click "Google Search".



**Figure3. Keyword searching on Google search**

| Self-Check -4 | Written Test |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Most information is found on the Internet by utilizing search engines
2. Search engine can be seen as an index of the web
3. Using directories for searching of information online is the only way
4. Search engines put the most relevant results first
5. Entering what you're looking for on search engine called as keyword searching

*Note:* **Satisfactory rating - 3 points          Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____          Date: _____

1. _____
2. _____
3. _____
4. _____
5. _____

| Instruction Sheet- | **LG08: Evaluate new or upgraded technology performance** |
|---|---|

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Testing and evaluation of new/upgraded equipment's
- Mobiles/smart phones and tablets evaluation
- Environmental consideration from new/upgraded equipment's
- Feedback from performance evaluation

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

1. Evaluate and determine new or upgraded technology performance by introduced technology (mobile/ Mhealth, tablets)
2. Evaluate mobiles/Smart phones and tablets for the performance, usability and against the OHS standards
3. Determine environmental considerations from new or upgraded equipment
4. use feedback from appropriate performance evaluation

**Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information "Sheet 1, Sheet 2, Sheet 3 and Sheet 4,---" **in page ---, ---, --- and ---** respectively.
4. Accomplish the "Self-check 1, Self-check t 2, Self-check 3 and Self-check 4" ,---" **in page ---, ---, --- and ---** respectively
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 " **in page ---.**
6. Do the "LAP test" **in page – ---**

## 1.1. introduction to diagnostic tools for new/upgraded equipment's

If you've never run a diagnostics test on your own smart phone, it's worth doing especially as your phone starts to show its age, or if you purchased a "new" smart phone secondhand and want to get a feel for its condition.

Diagnostic tools are also helpful for when your device becomes less efficient, but you can't quite pin down why. Instead of using guesswork to troubleshoot the various features on your phone until you stumble on a solution, a diagnostics scan can highlight exactly what's wrong with your phone, or at least provide enough data to point you in the right direction.

Unfortunately, finding the built-in diagnostics tools on Android smart phones and iPhones can be difficult, and some devices don't even have very good diagnostic options to begin with (if at all). But you can always turn to third-party apps for help.

### 1.1.1. Built-in diagnostics tools

### 1. Android
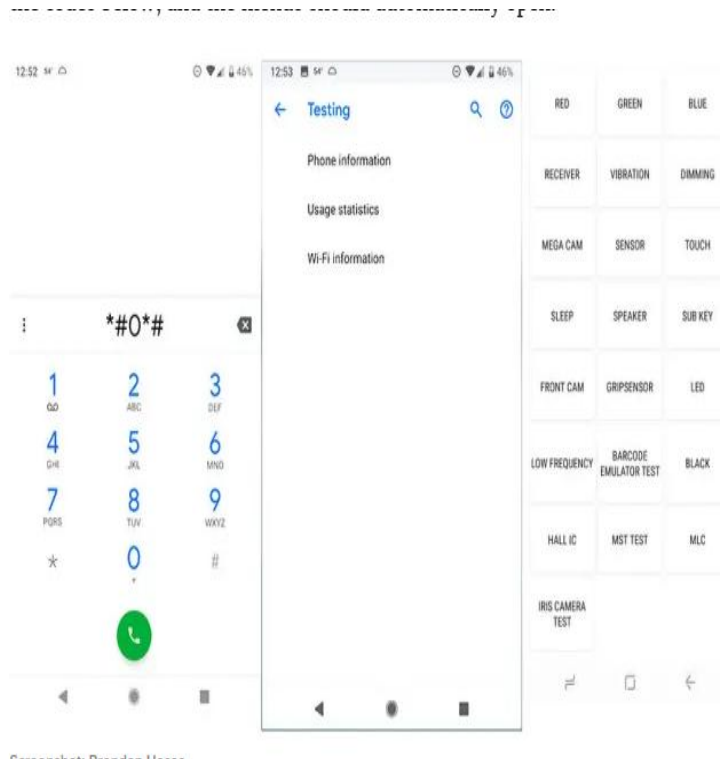


Most Android phones have a few simple diagnostics tools hidden in the OS, but they vary between devices. The tools are found by typing codes into your phone app's dialer—kinda like inputting cheat codes in a video game. Type in the codes below, and the menus should automatically open.

**The two main codes usable on most Android devices:**

1. **\*#0\*# hidden diagnostics menu**: Some Android phones come with a full diagnostics menu. You'll be able to run a check-up for at least some of the phone's hardware. However, this code isn't available on all phones—nothing happened when I tried the code on a Pixel XL, for example, though the menu appeared on a Samsung Galaxy S9. For those that do have access, it's a handy trick. The menu offers a number of standalone tests to check the performance of your phone's various parts, such as your screen (touch recognition, color accuracy), your cameras, sensor, and physical buttons like the power and volume controls.
2. **\*#\*#4636#\*#\* usage information menu**: This menu will show up on more devices than the hidden diagnostics menu, but the information shared will be different between devices. At the very least, you should be able to see app usage history; real-time wifi and cellular network connection stats; and basic phone information like the current service carrier, phone number, et cetera.

You don't have to press the call button or anything else to open the hidden menus, they'll just open automatically. If nothing happens when you type in the code, then your phone doesn't have the feature. Similarly, some devices don't provide very helpful information, like the aforementioned Google Pixel (which relies on Google collecting diagnostic information from your phone in the background). If that's the case, then jump on down to the next section for some recommendations for third-party diagnostics apps.

## 2. iPhone

Apple is notorious for its products being "walled gardens," which makes it hard for users to perform check-ups and DIY fixes for their devices. Unsurprisingly, you won't find any built-in diagnostics tests that you can run on an iPhone.

That said, the iPhone settings *do* include detailed readouts on battery performance and history. To find this data, go to **Settings > Battery.**

You'll find a number of different options and categories that contain your device's battery performance data—but nothing else beyond that, unfortunately.

### 1.1.2. Running diagnostics scans with third-party apps

With limited options available in iOS, the only real option for running diagnostics on your iPhone or iPad is to use a third-party app. These apps are also helpful for Android phones that don't have built-in diagnostics tools—or if you want a more detailed (and less cumbersome) way to test your phone's hardware.

## 1. TestM (Android and iOS)

This app lets you run both quick appraisals and full hardware diagnostics on iPhone and Android devices. The full scan performs simple actions that test each of your phone's major hardware functions, including the cameras; battery and charging; onboard sensors; and the performance of location, Bluetooth, and cellular connections.

Each test is simple, and the results are easy to read. If the scan detects something wrong, the app can give you recommendations for nearby repair shops. The only major downside to TestM is that it plays ads between each test, which is annoying. A premium, ad-free version can be unlocked for $18, but that's a steep price.

## 2. Phone Check and Test (<u>Android</u>)

Phone Check and Test is a plain-looking app, but it's capable of much more than just checking that your phone's hardware "works." A full scan includes deep CPU, storage, and battery diagnostics, and the test readouts are highly detailed. This makes Phone Check and Test a little less user-friendly than TestM, but it's an excellent troubleshooting tool that provides you with tons of data.

While the free version does contain ads, they're minimal, and you can upgrade to Plus for just $2 to remove them. The Plus version also adds a few more testing tools and lets you run standalone tests for each piece of hardware separately, which saves you time over a full system scan.

## 3. Phone Diagnostics (<u>iOS</u>)

Like the TestM app for Android phone, Phone Diagnostics can be an ad-ridden mess at times, but hidden behind all that is a reliable set of hardware function tests. The full test takes you through all the major hardware features based on the iPhone model you're using.

Unlike the other apps we've listed, Phone Diagnostics allows users to perform immediate standalone tests of any hardware function your iPhone carries without requiring a paid upgrade.

| Self-Check -1 | Written Test |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

6. A diagnostics scan can highlight exactly what's wrong with your phone
7. *#0*# hidden diagnostics menu works only for android smart phones and **tablets**
8. *#*#4636#*#* code is called as usage information menu
9. You don't have to press the call button or anything else to open the hidden menus on android smart phones and **tablets**
10. If nothing happens when you type in the code, then your phone or Tablet doesn't have the feature

*Note:* **Satisfactory rating - 5 points**     **Unsatisfactory - below 4 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____     Date: _____

**MCH question Questions**

Name:_____     Date:_____

**6.** _____
**7.** _____
**8.** _____
**9.** _____
**10.** _____

### 2.1. Technology evaluation

Technology evaluation is a set of principles, methods and techniques/tools for effectively assessing the potential value of a technology and its contribution to a company, a region or an industrial sector. It is one of the most significant methodologies in innovation and technology transfer, utilized in screening new ideas, assessing innovative or not innovative products and technologies. It is a powerful technique for an organization in examining new ideas, identifying and analyze causes or potential change, develop and plan possible solutions, and finally select and implement a proposed technology.

### 2.2. Technology evaluation may be understood in a variety of ways:

- As a group of studies, which systematically examine the effects on society that may occur when a technology is introduced, extended or modified. It emphasizes those consequences that are unintended, indirect or delayed.
- As an attempt to establish an early warning system to detect, control, and direct technological changes and developments so as to maximize the public good while minimizing the public risks.
- As a process of analysing alternative technologies that provides information and help the actors involved in developing their goals. A thorough evaluation assesses the technology and its device's value from technical, market and consumer perspectives and reconciles the results within a valid methodology.

### 2.3. **Mobiles/smart phones and tablets evaluation**

Smart phones, tablets and other similar mobile devices are being used increasingly both privately and in organisations. Another emerging trend is that users are given access to work-related information via their mobile devices. The increasing use of smart phones and tablets, in combination with the fact that both private and work-related spheres becoming ever more indistinguishable, means that operational information and information assets are being exposed in a new way through these mobile device

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

6. Technology evaluation is a set of principles, methods and techniques/tools for effectively assessing the potential value of a technology and its contribution to a company, a region or an industrial sector.
7. The increasing use of smart phones and tablets, in combination with the fact that both private and work-related spheres becoming ever more indistinguishable, means that operational information and information assets are being exposed in a new way through these mobile device
8. A thorough evaluation assesses the technology and its device's value from technical, market and consumer perspectives and reconciles the results within a valid methodology is an example of technology evaluation
9. Technology evaluation is one of the most significant methodologies in innovation and technology transfer

*Note:* **Satisfactory rating - 3 points**          **Unsatisfactory - below 3 points**

**Answer Sheet**

| Score = _____ |
| Rating: _____ |

Name: _____          Date: _____

**Short Answer Questions**

6. _____
7. _____
8. _____
9. _____

4.1. Introduction to environmental consideration from new/upgraded equipment's

Today, Computer is the basic need of every human. A computer made our life easier and saves a lot of time and human efforts, Use of computer plays a big role in environment pollution and Degradation but no one is aware about the harmful impacts of the use of computer on environment.

.Today there is a great need to implement the concept of Green computing and guide the common people to save our environment. Most of the $CO_2$ emission is produced through the heat generated by computer and its devices. The energy consumption by various computing devices also plays a main role towards harmful environment. The Toxicity and Pollution are caused due to Computers materials. To solve these Problems "GREEN COMPUTING" comes into existence. With the help of green computing we can save lot of energy and protect our environment from the harmful impacts of computers and its devices.

Green computing or Green IT refers to environmentally sustainable computing . It is also the environmentally responsible use of computers and related resources. One of the main objectives of Green Computing is about improving computing performance and reducing the energy consumption & carbon footprints.  This term generally relates to the use of computing resources in conjunction with minimizing environmental impact, maximizing economic viability, ensuring social duties, reducing the use of hazardous materials like CFCs, promoting the use of recyclable materials, minimizing use of non-biodegradable components, and encouraging use of sustainable resources.

## 1.2. Components of Green computing

Green Design – Designing energy efficient and environmentally sound components, computers, servers, cooling Equipment, and data centers.

Green Manufacturing – manufacturing electronic components, computers, and other associated subsystems with minimal impact on the Environment.

 Green use – reducing the energy consumption of computers and other information systems as well as using them in an environmentally sound manner.

Green Disposal – Refurbishing and reusing old computers and properly recycling unwanted computers and other electronic equipment. .

| Self-Check -3 | Written Test |
|---|---|

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Use of computer plays a big role in environment pollution and Degradation
2. With the help of green computing we can save lot of energy and protect our environment from the harmful impacts of computers and its devices.
3. One of the main objectives of Green Computing is about improving computing performance and reducing the energy consumption & carbon footprints.
4. Green disposal is a components of Green computing

*Note:* **Satisfactory rating - 3 points**       **Unsatisfactory - below 3 points**

**Answer Sheet**

| Score = _____ |
|---|
| Rating: _____ |

Name: _____       Date: _____

**Short Answer Questions**

1. _____
2. _____
3. _____
4. _____

### 4.1. Introduction to performance evaluation

In the context of an industrial organization, performance evaluation is a systematic evaluation of personnel by supervisors or those familiar with their performance. In other words, **performance appraisal** is a systematic and objective way of judging the relative worth or ability of an employee in performing his/her task.

### 4.2. Smart Phones and tablets  Skills Expectations

Always answers telephone calls with a positive, inviting, and enthusiastic tone.Talks in a steady speed rate, not so fast and not so slow. Speaks in a very clear enunciation and is well understood by the other person on the other end. Has a clear knowledge of the audience and does not use complex vocabularies and jargons. Greets the other person on the line with great sincerity and does not sound authentic and artificial .Gives the other person on the line time to ask before responding accordingly. Exhibits excellent listening skills and attentiveness while on the call. Always seeks clarification whenever the other person on the line is not clear. Ends telephone conversations professionally and ensures that the other person on the line is satisfied. Empathizes with other person and try to be as personable as possible.

## 4.3.  Smart Phone and Tablet  Skills Evaluation feedback point

- How well can you rate the way you handle your phone call conversations?
- How do you handle irate and upset callers during a phone conversation?
- Give an instance you were called by an irate caller and explain how you handled it?
- Have you ever interrupted someone while talking over the phone? How did the conversation turn out?
- Have you ever made a call while drinking or eating? How can you rate the conversation?
- Give an instance you had to talk to someone on the phone while in a loud place? How well did the conversation go?
- Do you typically take charge of the phone calls you make and how do you ensure to have everything under control?
- What is the best solution you have ever given to someone over the phone and was the caller satisfied?
- Do you usually call back when you promise to do so and have you ever failed to so at any given point?
- How well do you close conversations and do you feel you leave the callers in a satisfied position?

| Self-Check -4 | True False questions |
| --- | --- |

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. In the context of an industrial organization, performance evaluation is a systematic evaluation of personnel by supervisors or those familiar with their performance
2. One phone skill expectation is you have to always answers telephone calls with a positive, inviting, and enthusiastic tone
3. When you give feedback on phone empathizing with other person and trying to be as personable as possible is not included under your skill evaluation.

*Note:* **Satisfactory rating - 3 points**          **Unsatisfactory - below 3 points**

**Answer Sheet**

Score = _____

Rating: _____

Name: _____          Date: _____

**Short Answer Questions**

1. _____
2. _____
3. _____

**Reference**

1. Navdeep Kaur Maan et al, International Journal of Computer Science and Mobile Computing  Vol.2 Issue. 6, June- 2013, pg. 156-162

2. How    to    test    android    and    iphone    smart    phones    and    tablets
   https://lifehacker.com/how-to-run-diagnostics-tests-on-your-smartphone  recieved
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3. Technology                                                                              evaluation
   https://www.urenio.org/newventuretools/cba/overview.html