

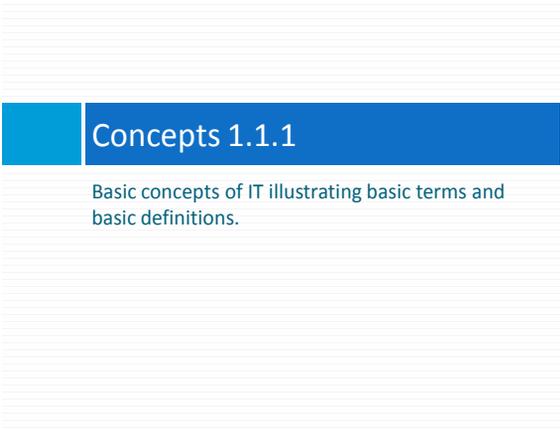


ECDL MODULE 1

Concepts of Information and Communications Technology (ICT)



HARDWARE 1.1



Concepts 1.1.1

Basic concepts of IT illustrating basic terms and basic definitions.

What is Hardware?

- Hardware refers to the **physical** parts of the computer system.
- These computer devices include:
 - ▣ Monitor
 - ▣ Keyboard
 - ▣ Printer
 - ▣ Hard Disk



Personal Computer

A personal computer is a computer which can be used to perform a variety of day-to-day tasks. Mainly these can be classified as Desktops, Laptops and Tablet PCs.

Desktop PCs

- The **desktop PC** is designed to perform a variety of tasks such as typing a document, editing a video, listening to music or browsing the Internet.
- It is very affordable, so it's one of the most common types of computers.
- It's mainly used by the home user, in offices and schools.



Desktop PCs (Apple Mac)

- The Mac is very similar to a conventional desktop PC, however the main difference is its design.
- It also uses different programs which are more suited for multimedia editing.



Laptop (or Notebook)

- A laptop is similar to a Desktop PC but its components are much smaller and so these can fit in a compact unit.
- The laptop is ideal for people on the move since it can be carried around.



Tablet PC

- A Tablet PC is more portable than a Laptop since it usually does not need a keyboard and a mouse to be controlled.
- Instead a touch-screen can be used to input data or interact with the computer.
- This is ideal for sales person since it's very compact.



Hand Held Computers

Small computers which are very convenient since these can be very easily carried around.

PDA (Personal Digital Assistant)



- This handheld computer provides a calendar and organizer for personal information.
- A PDA normally contains at least one database with names and addresses, to-do lists and a notepad.
- Information can be entered into it by handwriting using a stylus.

Mobile Phone



- A mobile phone allows voice or data communication.
- These offer more applications such as SMS, MMS, Games, Video, Photos, Bluetooth.

Smart Phone



- A **smart phone** offers the same functionality of a mobile phone but it adds more PC-like functionality.
- Smart phones allow the user to install additional applications which will add more functionality to the smart phone.

Multimedia Player



- The **Multimedia Player** stores, organises and plays audio files such as MP3s.
- Other variations of the multimedia player allow videos to be played as well.

Main Parts of a Computer System

A computer system is made up of various hardware devices.

System Unit

- The system unit (also called *Tower* or *Case*) is where all the computer components are stored.
- It contains these devices:
 - CPU
 - Motherboard
 - Memory
 - Hard Disk



The Motherboard



- Connects all the different components to each other and so it allows them to communicate with each other.

CPU (Central Processing Unit)

- CPU can be considered to be the brain of the computer.
- It determines the speed of the computer, and it performs all the major functions of the computer.



RAM (Random Access Memory)

- RAM is the memory used by the computer whilst it is switched on.
- This is a very fast memory and running programs are stored in it for fast execution.
- Contents in the RAM will be lost when the computer is switched off.



ROM (Read Only Memory)

- This is a read only memory and the contents stored on it cannot be changed.
- A typical use for ROM is to store the *BIOS* (basic input output system) which is executed when the computer is turned on so that it loads the operating system.



Hard Disk

- The hard disk is the main storage device used by the computer to store all the user's data and programs.
- It is quite fast and can store vast amounts of data.



Peripheral Devices (externally connected devices)

Input Devices

- These are used to control the computer or to give information to the computer. These include:
 - ▣ Mouse
 - ▣ Keyboard
 - ▣ Webcam

Output Devices

- Used by the computer to return results to the user. These include:
 - ▣ Speakers
 - ▣ Monitor
 - ▣ Printer

Input / Output Ports

Used to connect peripheral devices with a computer system.

I/O Ports

Serial Port

- A serial port allows computer devices to connect with the computer.
- When using this connection only 1 bit at a time can be transmitted.



Parallel Port

- A parallel port serves the same function of a serial port but it's faster because it allows 8 bits to be transmitted at any time.



USB – Universal Serial Bus

- The USB connection allows devices to be connected to a computer system in order to transfer data.
- It can connect devices such as digital cameras, mice, printers, scanners to a computer.
- It has replaced serial and parallel connections.



I/O Ports

Firewire

- This is very similar to USB however it is much faster.
- It is mainly used to connect video and audio devices to the computer system.



Network Port

- This allows the computer system to connect to a network such as LAN or the Internet.



Computer Performance 1.1.2

What are the factors that affect the performance of a computer?

CPU

- The CPU determines the speed at which program instructions are carried out.
- The CPU speed is measured in hertz. This means that 1 Hz = 1 instruction per second. However new CPUs have a very high speed. For instance:
 - ▣ **3 Gigahertz (Ghz)** (3 billion instructions / second)
- More MHz or GHz = Faster Computer

CPU

- Three main components found inside the CPU are:
 - ▣ **Arithmetic Logic Unit (ALU)** - which performs arithmetic (+,-,/,*) and logical (<,>=) operations.
 - ▣ **Control Unit (CU)** – tells the rest of the computer how to carry out a program’s instructions.
 - ▣ **Registers** – This is very fast memory locations found inside the CPU which are used to store temporary results.

Computer Performance

- Computer Performance is affected by:
 - ▣ CPU Speed
 - ▣ Amount of RAM
 - ▣ Graphic Card Processor
 - ▣ Graphic Card Speed
 - ▣ Hard Disk Speed
 - ▣ Hard Disk Space
 - ▣ Number of Running Applications



Memory and Storage 1.1.3

How computer memory is measured and a description of the main storage devices used to store data.

RAM – Random Access Memory

- RAM is a **volatile** storage that stores the programs and data the CPU is presently processing. Volatile means that when the computer is switched off all data is lost.
- RAM is a read and write memory, so data can be stored in it and read from it as well.



RAM – Random Access Memory

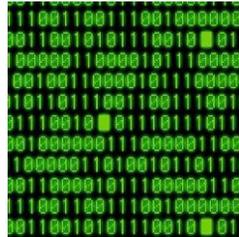
- When an application is run, the computer reads the program from the hard-disk and loads (copies) it to the RAM. This is done to speed up the performance of the computer since RAM is faster than the hard-disk.

ROM – Read Only Memory

- ROM is a type of memory that store a program built into them by the manufacturer.
- The ROM stores an important program on a permanent basis which can be accessed any time.
- ROM is non-volatile, this means that it cannot be changed or deleted and when the computer is switched off, its contents are not lost.

Measuring Memory

- Bit – short for **Binary Digit**. It is the smallest unit of information on the computer. A single bit can only hold two values, 1 or 0.
- Byte (B) = 8 Bits
- Kilobyte (KB) = 1024 bytes
- Megabyte (MB) = 1024 KB
- Gigabyte (GB) = 1024 MB
- Terabyte (TB) = 1024 GB



Example of Measuring Memory

- For example one character requires **1 byte** (8 Bits) in order to be stored on a computer system.
- So, the word **Hello** requires **5 Bytes** (5x8=40 Bits).
- And, a typical typed page in a word processor has **4000 characters** hence it requires **4000 bytes ~ 4KB**.

Floppy Disk

- A floppy can store a small amount of data (around 1.44MB). It stores data magnetically.
- It is very slow, so accessing data on the floppy takes a longer time than from a hard-disk.
- Floppy disks are expensive at 60c when compared to other media (such as CDs and DVDs).
- They have been discontinued.



Data Cartridge (Tape)

- Tapes can store large amounts of data and so are ideal for backups since these are cheap as well.
- Tapes store data magnetically as well. Most modern tapes can store up to 100GB of data.



Internal Hard Disk

- The hard disk is considered to be the primary storage since it stores the majority of files in a computer system.
- It can store large amounts of data (more than 250GB). Data is stored magnetically as well.
- It is very fast and relatively inexpensive.
- An internal hard disks is fixed inside the computer.



External Hard Disk

- The external hard disk is identical to the internal hard disk but instead of installing them inside the system unit, these can be plugged to it using USB or Firewire.



CD – Compact Disk

- The compact disk can store 700MB of data.
- It is an optical device since it uses laser beams to store data.
- There are 3 types of CDs:
 - CD-ROM = read only
 - CD-R = write-once
 - CD-RW = rewritable
- It is very cheap and quite fast.



DVD – Digital Versatile Disk

- The DVD works on the same principle of a CD due to improvements in technology it can store more data around 4.7GB.
- There are 3 types of DVDs:
 - DVD-ROM = read-only
 - DVD-R = write-once
 - DVD-RW = rewritable
- DVD is quite cheap and relatively fast.



USB Flash Drive

- The flash drive (pen drive) is an electronic storage medium can be plugged in the USB and can be used as removable storage.
- Typical capacity can range from 2GB to 32GB.
- These are very portable and relatively inexpensive.



Memory Card

- Memory Cards are electronic storage mediums.
- These are used in many handheld devices such as Digital Cameras and Mobile Phones.
- They are ideal for portable devices due to their size and price.



Online File Storage

- Files can also be saved on remote servers using an Internet connection.
- The benefits of saving files online are
 - Files can be accessed from any computer having Internet access, therefore not limited to the same computer.
 - Files can also be shared amongst friends and colleagues.

Input, Output Devices 1.1.4

Input devices allow the user to control the computer, whilst output devices allow the computer to give results back to the user.

Input Devices

Mouse



- Mouse is used to move the cursor or pointer on a display screen.
 - Mechanical mouse use a roller ball to move.
 - Optical mouse use laser beams to move.
 - A scroll wheel is used to scroll large documents.
 - Mouse buttons are used to select or click various options and/or buttons.

Keyboard

- Keyboard – the most common method of input.
- It is known as QWERTY keyboard because of the first six characters of the keyboard.



Trackball

- Trackball is a pointing device, it is very similar to a mouse but the cursor is moved by rolling the ball on top.
- It also has the left and right buttons.
- One main benefit is that it does not require a lot of space since it does not have to be moved!



Scanner

- A Scanner is a device that transfers printed text and images to a computer.
- Flatbed scanners are the most common.
- Typical applications of scanners are:
 - Scan pictures to edit and manipulate them.
 - Scan text to a word-processor using an OCR (optical character reader).



Touchpad



- Touchpad is a small, touch sensitive pad used as a pointing device on laptops.
- By moving a finger along the pad you can move the pointer on the display.
- Tapping the pad acts as clicking a mouse.

Stylus

- A stylus is a pen which can be used on smart phones and other handheld devices in order to navigate menus and give commands to these devices.
- These can also be used to draw or to write directly on screen.



Joystick

- A joystick is mainly used for games and can be used to control computer characters and interact with the games.
- Nowadays, controllers are much more common.



Webcam

- Allows moving images to be transmitted across a network between different computers.
- Mainly used for video chat and surveillance.



Digital Camera

- The digital camera stores the images as a digital files on flash memory which can be transferred to a PC.
- Advantages include:
 - The photo is seen before and after shooting.
 - A large number of photos can be stored.
 - Only desired pictures can be printed.



Microphone

- The microphone is used to convert sound waves into electrical current, which in turn the computer can understand and reproduce as sound.
- Can be used to communicate with others.



Output Devices

Monitors

- Displays main output of computers.
 - CRT (Cathode Ray Tube)
 - Bulky
 - Discontinued
 - LCD (Liquid Crystal Display)
 - Low Radiations
 - Compact
- Also called TFT (Thin Film Transistor)



Impact Printers

- Impact printers use a metal head to press on an ink ribbon which then leaves an impression on the paper (this is very similar to a typewriter).
- A common impact printer is the Dot-Matrix.

Dot-Matrix

- Characters and illustrations are created by striking pins against an ink ribbon.
- Not good for high quality printouts. Used where quality is not important such as printing out a receipt or multiple copies.
- They are inexpensive but quite noisy.



Non Impact Printers

- These printers do not need a mechanical head to hit an ink ribbon but instead ink is sprayed on paper, or toner (fine particles) sticks to paper to form the required text.
- The non-impact printers include Inkjet and Laser printers.

Inkjet Printer

- The inkjet sprays small droplets of ink at high speeds onto the paper.
- Produces high quality printouts, even photographs on glossy paper.
- It is reliable, quiet and inexpensive but the running cost (ink cartridges) is quite high.



Laser Printer

- The laser printer uses a technology similar to the photocopier machine.
- A laser beam is used to fuse toner with the paper to produce images with excellent quality.
- They are quiet and fast, but rather expensive to buy.



Large Scale Printers

- This is a large-scale inkjet printer capable of producing bar charts, maps, architectural drawings.
- It can produce high quality colour documents and can print on large scale paper.



Speakers

- Speakers are used to convert computer electronic signals into sound.
- Speakers can be set up in a variety of ways such as stereo, surround and 3D.



Headphones

- Headphones include a pair of small speakers which are held very close to listener's ears for personal hearing.



Input / Output Devices

Touch Screen

- The touch screen is designed or modified to recognize the location of a touch on its surface.
- By touching the screen, the user can make a selection or move a cursor.



SOFTWARE 1.2

Concepts 1.2.1

Software is a program that instructs the computer what to do and how to do it. There are a variety of programs which perform different tasks.

Software

- The computer hardware on its own has no intelligence and therefore must be supplied with instructions to perform any task.
- Software or programs, consist of step-by-step instructions that tell the computer how to perform a task.
- Software is divided into 2 categories:
 - **System Software** and
 - **Application Software.**



Operating Systems

An operating system is software required to control the computer and allows more applications to be installed.

Operating System Software

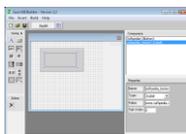
- The OS is a program that controls the computer and enables it to run application software.
- It allows the computer to manage its internal resources.
- The software runs the basic computer operations – it tells the hardware what to do, how to do it, and when to do it.



GUI and CLI

GUI (Graphical User Interface)

- A GUI allows the user to control the computer by using graphical elements such as windows, icons, buttons, cursors and scroll bars.



CLI (Command Line Interface)

- The CLI allows the user to control the computer by typing in commands. So everything must be done by typing in a command.



DOS (Disk Operating System)

```
Current date is Tue 1-01-1980
Enter new date:
Current time is 7:48:27.13
Enter new time:

The IBM Personal Computer DOS
Version 1.10 (C)Copyright IBM Corp 1981, 1982

A>dir/w
COMMAND COM  FORMAT COM  CHKDSK COM  SYS COM  DISKCOPY COM
DISKCOMP COM  CDMP COM  EXE2BIN EXE  MODE COM  EDLIN COM
DEBUG COM  LINK EXE  BASIC COM  BASICA COM  ART BAS
SAMPLES BAS  MORTGAGE BAS  COLDRBAR BAS  CALENDAR BAS  MUSIC BAS
DONKEY BAS  CIRCLE BAS  PIECHART BAS  SPACE BAS  BALL BAS
COMM BAS
26 File(s)
A>dir command.com
COMMAND COM 4959 5-07-82 12:00p
1 File(s)
A>
```

Windows 7



Mac OS X



Linux



Application Software

Programs that perform a specific task.

Application Software

- This is software that help the user carry out specific task such as word-processing, spreadsheet, games, chatting and more.
- Application fall under two styles
 - **Tailor-made:** software designed for the particular customer.
 - **Off-the-shelf:** for use by the general public.

System Development

- This is a process where new software is created based on the user requirements. It is made up of five stages:
- **Analysis:** The current system is studied and problems are discussed to obtain new requirements.
- **Design:** The new system along with improvements is discussed, designed and proposed.
- **Programming:** The actual software is created.
- **Testing:** Check that the newly created system meets the customer's requirements and that the new program works correctly.
- **Maintenance:** System is reviewed to ensure that it is working correctly.

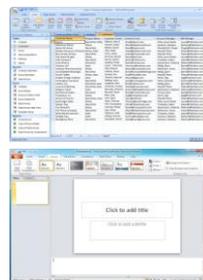
Application Software Examples

- **Word Processing:** used to prepare documents such as letters, reports, memos such as Microsoft Word or LibreOffice Writer.
- **Spreadsheet:** Analyse and summarise numerical data, used in accounts such as Microsoft Excel, LibreOffice Calc.



Application Software Examples

- **Database:** Organise and manage a large quantity of data such as Microsoft Access or MySQL.
- **Presentation:** Organises text, graphics and audio in a format to be displayed to a group of people such as Microsoft PowerPoint.



Application Software Examples

- **Internet Web Browsers:** used to locate and display information from web sites such as Internet Explorer and Mozilla Firefox.
- **E-Mail Clients:** allows users to view and send e-mails such as Outlook or Mozilla Thunderbird.



Application Software Examples

- **Photo Editing:** used to edit photographs or images and apply effects or filters such as Photoshop or GIMP.
- **Games!**



Accessibility Options

Features in the OS that help users with impairment use the computer.

Accessibility Options

Voice Input

- Controls the PC by speaking to it.
- Software has to be 'trained' to recognise voice of the user.



Screen Reader

- Software identifies what is happening on screen and reads it to the user through the speakers.

Accessibility Options

Screen Magnifier

- Used to enlarge a part of the screen so that it can be easily viewed.



On-Screen Keyboard

- A keyboard visible on screen which can be used instead of an actual keyboard.





NETWORKS 1.3

Network Types 1.3.1

LAN, WLAN and WAN

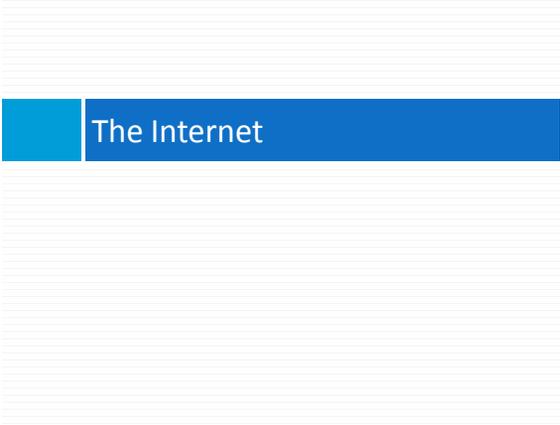
- Million of computers are connected together.
- These connections are established to attain higher processing powers and to establish communication of data between different computer and sharing resources. Such computer connections are referred to as networks.



LAN and WLAN

- Local Area Network: networks which are concentrated in a single location with most of the machines connected using cables.
- Examples: computers in a school, a department or offices.
- WLAN (Wireless LAN) is the same as a LAN but no physical connections are required.





The Internet

The Internet

- Internet is short for International Networking.
- Consist of thousand networks connected to each other which in turn connect millions of computers together across the world.



Services Of The Internet

- **World Wide Web (WWW):** a collection of documents available for the public also knows as Web Pages. These have developed from text only to graphics, sound and videos pages.
- **Electronic Mail (Email):** transmission of messages over a network. These messages can contain text, graphics, and sounds.



Search Engines

- The contents of the WWW contain all sorts of data, text, sound, graphic, and video clips – also known as Web Pages.
- Each web page has its own unique address known as the URL (universal resource locator). If you do not know the URL you can use search engines which locate websites via searches for keywords and phrases.
- Examples are Yahoo!, Google and Bing.



Other Networks

Intranet

- A private network inside a company or organization, which uses software like that used on the Internet, but is for internal use only (only employees can use it), and is not accessible to the public.
- Companies use Intranets to manage projects, provide employee information, distribute data and information, etc.

Extranet

- An extension of Intranet using World Wide Web technology to facilitate communication with the corporation's suppliers and customers.
- An extranet allows customers and suppliers to gain limited access to a company's Intranet in order to enhance the speed and efficiency of their business relationship.

Data Transfer 1.3.2

Download and Upload

- When a computer is connected to a network it can send and receive data.
- **Downloading** is the process of retrieving data from a network (e.g. downloading a picture or a movie clip).
- **Uploading** is the process of sending information to a network (e.g. sending an e-mail).

Data Transfer Rate

- Data being transferred on a network is measured in bits per second (bps).
- However this is a very small amount and larger units are used:
 - KBPS (Kilobits per second) = 1000 Bits per Second
 - MBPS (Megabits per second) = 1000 Kilo Bits per Second
- Typical connection of ADSL is 2Mbps, 8Mbps and 12Mbps.

Different Connection Methods

- **Dial up** uses the PSTN line to connect to the Internet. This is a very slow connection, and if the line is used by the Internet it cannot be used for voice communication.
- **Broadband** uses ADSL or Cable to connect to the Internet, it's faster and always-on.

Internet Connection Services

Data Communication

- **PSTN** (Public Switched Telephone Network): is the standard telephone network.
- Originally developed to transfer sound. Telephone system is an analogue network, i.e. it transmits data as a series of sound signals.



Data Communication

- **ADSL** (Asymmetric Digital Subscriber Line): is a way to transmit data over traditional copper telephone lines at speeds higher than were previously possible.
- Data travels downstream faster than it travels upstream -- hence the name "asymmetric."



Connections

- Different systems can be used to connect to the Internet. These include:
 - Phone Line
 - Mobile Phone
 - Cable
 - Wireless
 - Satellite

Modem

- A modem is required to connect the computer to a network such as the Internet via the telephone line.
- Computer needs to change analogue signals to digital signals (modulation) and vice-versa (demodulation).



Characteristics of Broadband

Pros

- Always On – No need to dial up.
- Flat Fee – A fixed price is set.
- Higher Speed

Cons

- Higher Risk of Intruder Attack

Electronic World 1.4.1

Computers at Work

- Where can a computer work better than a human?
 - Dangerous places
 - Repetitive tasks
 - Mathematical calculations



Computers at Work

- Where can only a human work, and the computer cannot?
 - Art
 - Hand-made items
 - Creativity
 - Human Contact



Computers at Work

- Large-Scale Business
 - ▣ Airlines
 - ▣ Insurance
 - ▣ Online Banking
- Government
 - ▣ Public Records
 - ▣ Revenue Collection
 - ▣ Electronic Voting
 - ▣ Vehicle Registration



Computers at Work

- Hospital
 - ▣ Patient Records System
 - ▣ Ambulance Control System
 - ▣ Diagnostic Tools
- Education
 - ▣ Computer Based Training
 - ▣ E-Learning
 - ▣ Student Registration



E-Commerce

- Computer networks are replacing our shopping habits. More and more people are selling and buying over the internet.
- Users use credit cards to buy over the net.
- Genuine shops use secure servers.



E-Commerce

- To purchase online items one must fill in certain personal details before a transaction is carried out.
- Payment methods include Credit Cards, and online money.
- Consumer has the right to return unsatisfactory goods.

E-Commerce

- Advantages of buying online
 - Services available 24 hours a day
 - Wide range of products
 - Compare prices on the fly
 - Buy from any shop across the world



E-Commerce

- Disadvantages of buying online:
 - Virtual store
 - No human contact
 - Insecure payment methods



E-Banking & E-Government

E-Banking

- Bank customer can use the Internet to check bank accounts, transfer money and pay bills.

E-Government

- Government offers services via the Internet such as paying taxes, ordering documents.

E-Learning

- Flexible Learning Time – No fixed schedule therefore students can study on their own time.
- Flexible Learning Location – No need to attend a physical location, therefore one can study from home.
- Multimedia Experience – Includes pictures, audio and videos which can enhance the lessons.
- Cost Effectiveness – No need to pay for accommodation, transport, etc...

What is Tele-Work?

- Telework (also called telecommuting and remote work) describes a situation where an employee is working anywhere but in their traditional office.
- A typical scenario involves employees working at home either full or part time, but they could also be working on travel assignments or at remote work centers or on the road day by day.

IM & VoIP

Instant Messaging

- Instant Messaging allows users to communicate with each other in real-time via text messages.



Voice Over Internet Protocol

- This allows the user to make voice calls using the Internet connection rather than conventional telephone systems.



RSS

- Really Simple Syndication is a summary of all the headlines in frequently updates sites.
- This will contain text summaries without any formatting or multimedia for quick access.

MSB Feed Fair | NBC News | News Front Page | World Edition
Below is the latest content available from the feed. This isn't the feed I want.

Africa groups condemn Niger coup
The African Union leads criticism of a coup in Niger, after soldiers seize power promising to restore democracy and end corruption.

China anger at Dalai Lama visit
President Obama's talk with the 14th Dalai Lama in Washington have "seriously undermined" US-China relations, Beijing says.

Doctors find 5,000 new species
A marine cruise involving 60 countries has discovered 5,000 new species, many of them with healing powers, scientists say.

Russia policeman guilty of murder

Russian ex-police officer who shot dead two people at random in a supermarket gets life in jail for murder

Tiger Woods set to break silence

Tiger Woods will speak publicly on Friday for the first time since the scandal surrounding his private life erupted.



Web Log (Blog) & Podcast

Blog

- A Blog allows users to post their thoughts online in a chronological order.
- Typical examples include Blogger and Wordpress.

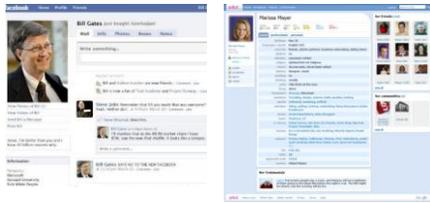
Podcast

- A podcast is an audio or video show which is broadcasted on the Internet.
- It can also be downloaded to portable devices.

Virtual Communities 1.4.3

Social Networking

- This allows people to create their profiles and keep in touch with friends and relatives by posting messages, photos and videos.



Internet Forums & Chat Rooms

Internet Forums

- Users can post messages in a forum group usually related to a particular topic.
- Then other users can reply to the message at their own leisure.

Chat Rooms

- People choose a handle (nickname) and can meet in these chat rooms to chat with each other via text messages.

Online Games

- Online games allow users to play against other users in an online world using the Internet.
- This allows interaction between different users.



Publish and Share Content

- Publishing content on the Internet is very easy and various services exist for different media including:
 - Blogs
 - Podcast
 - Video
 - Audio
 - Pictures

Precautions

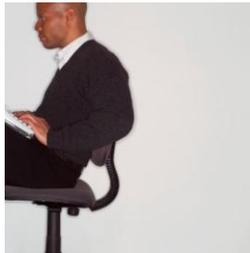
- Always make sure to use a private profile so that only people you trust can see your profile.
- Limit the information submitted on the Internet, do not include sensitive information such as Address and Telephone Number.
- Remember that data submitted on the Internet can be public data and anyone can see it.
- Be wary of strangers, people can hide behind different personas on the Internet.



Health 1.4.4

Health and Safety

- Although the computer is a very useful tool, it has also its negative impacts on our physical and mental health.
- Ergonomics is the study of the physical relationships between humans and computers.



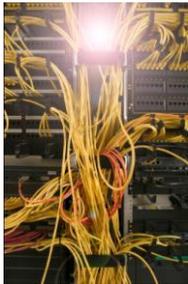
Health and Safety

- Eyestrain and headaches – usually arise because of improper lighting, screen glare, and prolonged periods in front of your computer. To minimise:
 - Take frequent breaks like 10 minutes every hour
 - Avoid computer screens that flicker
 - Keep computer screens away from windows and other source of bright light to minimise glare
 - Clean your screen from dust
 - Use eye relaxation techniques

Health and Safety

- **Back and neck pains** – usually arise because of incorrect postures and incorrect positioning of the equipment and furniture
- **RSI** – Repetitive strain injury happens when the computer is used repetitively for a long period of time. RSI can be minimised by taking frequent breaks.
- **Light Source** – Make sure that room is adequately lighted and light sources do not reflect on the monitor.

Health and Safety



- Good working environments:
- A good workspace – well ventilated which reduces overheating of the equipment
 - Cables and power supply – Cables securely plugged into the sockets, neatly tied and no overloading.

Environment 1.4.5

The Environment

- Recycle empty printer cartridges and paper.
- Using a monitor that consumes less power
- Turn off computer when not using it, or use stand-by option
- Using electronic documents reduces paper waste



SECURITY 1.5

Identity / Authentication 1.5.1

Protection of Data

- Due to this constant transfer of data, there must be security plans which protect this data from unwanted use and access.
- A type of security system is the User ID and password. Every user has his/her own unique name, and for every ID there is a password.



Good Password Policies

- Do not share passwords
- Change passwords regularly
- Use an adequate length for the passwords
- Combine letters, numbers and other characters.

Data Security 1.5.2

Data Security

- Backing up data, means that one has two or more copies of the original data.
- So that if something happens to the original (which is common), one would still have a copy of the original and can simply replace it back!
- Off site – Store backups in a different location rather than next to the original data.

Firewall

- A firewall protects a computer connected to a network from unauthorised access.
- This is done by blocking unused ports and asking the user for confirmation before applications connect to a network.



Theft!

Protection

- Always use a user name and a password
- Lock computer when not in use
- Use a security cable with laptops.

Theft

- Theft of a Laptop, PDA, mobile can have various implications.
 - Misuse of confidential files
 - Loss of files
 - Loss of contact details
 - Misuse of telephone numbers

Viruses 1.5.3

Computer Viruses

- A computer virus is a small program which is designed to copy itself on many computers without the user knowing it. They are designed with malicious intent.
- Effects of viruses can be, deletion of files, slowing down the system, restarting the system and some simply annoying the user.



Computer Viruses

- Viruses spread by:
 - Introducing infected disks into the computer
 - Open infected files from e-mail attachments
 - Sharing of infected files over a network
 - Downloading an infected file from the internet



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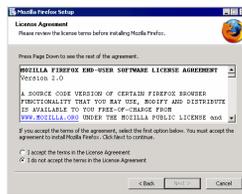
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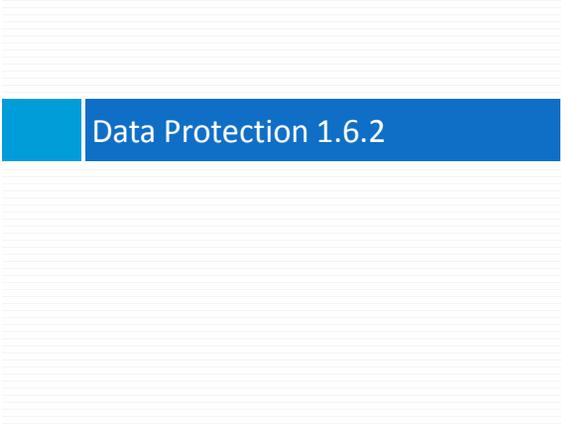
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Data Protection Act



- This legislation sets out to define the rights of organisations and individuals in terms of how personal information is gathered, stored, processed and disclosed.
- One of the most important aspects of the Act is a focus on the individual's rights to view the information stored on them and ensure that it is accurate.
- Information gathered cannot be handed –in to a third party.
