

Information Networks:

LAN – Local Area Network - A LAN is a system whereby individual PCs are connected together within a company or organization. In this way, the office can have a single printer and all people can print to it. Even more useful is the ability to share information on hard-disks. Other devices such as modems or scanners can also be shared. Used in Schools, Universities, Small companies etc.

WAN – Wide Area Network - A WAN as the name implies allows you to connect to other computers over a wider area (Banks network, Internet).

Client/Server – On a network the Client computer is the one who asks for the information while the Server is the one who gives/supplies the information (ex: Your Computer is a client of the Server Google when you search using Google on the Internet). In some situations (Chatting) a computer can be at the same time a client and a server.

Workgroup computing - People within the workgroup can share information on their hard disks as well as sharing printers, modems and scanners. The workgroup is connected via a computer network.

Advantages of a Network:

There is less chance of major disruption if one computer goes down for a while.

People can share data, hard disks, printers and other devices with colleagues.

Since devices are virtually connected to all computers there is no need to buy many printers or Cd writers. This results in considerable cost savings.

Disadvantages of a Network:

Sharing files with many other people, can significantly slow down the running of the PCs.

Unauthorized access to a computer will jeopardize the security of the whole network.

Files on your PC, can be damaged or deleted, by other members.

Types of Networks:

Intranet – It is a small closed network which can only be accessed by authorized members of an organization. An Intranet uses Internet technologies to allow users to access company documents, search databases, schedule meetings and send emails.

Extranets - It is an Intranet that is partially accessible to authorized outsiders. An Intranet is normally only accessible by members of the same company or organization; an

extranet also allows outsiders with a password to gain limited access to information held on a company network.

Internet – The Internet is a global network of interconnected networks. It is accessible by all people around the world. The idea was developed by the US military and later it was adopted by the educational system, and now exploited by the commercial world. The unique thing about the Internet is the sheer amount of information that you can access from it. If you publish material on the Internet, it can be accessed by everyone on the net (providing they can find it!)

WWW - The World Wide Web is just a small part of the Internet as a whole. It is one of the services offered through the Internet connection. This service is basically the text and pictures that you can view using your web browser, such as Microsoft Internet Explorer. Other services exist, such as E-Mail, FTP (for file transfers), IRC (chatting) etc.

Internet & The Telephone Network

The Telephone - If we use a modem to connect to the Internet, then this connection is made via the telephone network. On the other side, the answering computer is connected to the Internet and through the telephone network our computer is connected to the Internet.

Modem - The modem sends information from your computer across the telephone system using the analogue signal. The modem at the other end of the phone line, converts the signal back into a digital format that can be used by the receiving computer.

Baud rate - The baud rate tells us how fast a modem can send/receive data.

Computers at Work:

Computers are more appropriate than people:

- Repetitive tasks – in a factory, doing the same thing repetitively
- Easily automated tasks – a telephone exchange system, calculating totals
- Mathematical calculations – tax calculation systems
- Dangerous situations - Monitoring of dangerous, polluted or radioactive environments

People are more appropriate than computers:

- Computers have limits – decision making, understanding images, thinking/reasoning
- In caring professions, social situations – Interviews, nurses, doctors
- Certain circumstances of commerce – Take-away, Cinema ticket

Large scale computer applications in business:

Business administration systems: The classic use of a computer is to run business administration systems.

Airline booking systems: Airline booking systems have long been computerized. This maximizes profit for the airline companies and is often more convenience for the customer.

Insurance claims processing: All insurance companies use very large mainframe computers, combined with specialist software to manage their business.

Online banking: Most banks now offer some form of online banking. This has the advantage to the bank that costs can be reduced. Some banks are completely online, with no physical branches at all. The customers benefit from 24-hour access to banking services.

Computer applications in education:

Student registration and timetabling

Computer Based Training (CBT) offers a low cost solution to training needs where you need to train a large amount of people on a single subject. These programs are normally supplied on CD-ROM / DVD and combine text, graphics and sound.

Using the Internet as a homework resource.

Distance learning systems: E-learning is a term used to describe studying via the Internet. It can take many forms ranging from a simple web version of printed books, through to advanced use of video images with sound.

Advantages include:

- One trainer can train many people at many different locations.
- If the training is solely computer based, then the students can work at their own pace.
- Also the teaching can be at any time, 24 hours a day, 7 days a week.
- Often e-learning solutions are cheaper to provide than other more traditional teaching methods.

Disadvantages include:

- There may be no opportunity to ask a question of a real person.
- In some cases you may have to pay for the connection time, by the minute.
- The download speed may be too slow.

Teleworking

This refers to people working at home while connected to the rest of the organization via a computer network.

Advantages:

Reduced or Zero commuting time – Since people stay at home we save time and money from traveling daily to work. This also means less traffic jams and less car pollution.

Flexible times – In many cases as long as the job is done the time in which people work is irrelevant.

Reduced office desk space – Apart of being more comfortable at home, the company reduces the desk space required at the place of work since people will be working in their home instead in the companies' buildings.

Disadvantages:

Lack of Self-Discipline – Since at home there is no supervisor, employees tend to fool their employers by doing other work.

Lack of human-contact – Since people are all in their private homes, there is very limited groupwork. In some situations this tends to lessen the quality of their work.

Possible Employee Exploitation – Since workers are isolated there is a possibility for companies to take advantage by exploiting particular employees.

Electronic World:

VoIP - Voice translated into data and transmitted across an internet connection or network - just like any other file or email you might send. Upon reaching the other end data is transformed back into its original form and emerges like a regular phone call.

RSS - Really Simple Syndication, is a method of sharing and broadcasting content such as news from a website. Using XML, items such as news articles can be automatically downloaded into a News Reader or published onto another website

Blog - A blog is basically a journal that is available on the web. The activity of updating a blog is "blogging" and someone who keeps a blog is a "blogger." Blogs are typically updated daily using software that allows people with little or no technical background to update and maintain the blog.

Podcast - This a name that has been popularised by the use of iPods and is essentially a multimedia broadcast hosted on a website. It can be audio or video based and is delivered in a format which is portable with all computers and some mobile devices.

Chat - A program that connects computers on a network for instantaneous, multi-way communication. People who use chat can type messages for delivery to a server, which displays the messages instantly so that users who are logged on to the chat service can respond immediately. It is real-time, synchronous, text-based communication via computer.

Instant Messaging - Instant Messaging (IM) is a rapid means of online communication. Instant Messaging programs often allow people to control who they communicate with and who can see their availability. There are many types of these applications such as MSN Instant Messenger, Yahoo Messenger and Skype.

E-Mail – Allows us to send a message to another person anywhere in the world in a very short time. It does not require that the two computers are connected simultaneously at the same time. Pictures, videos and digital files can be sent as attachments.

E-commerce - Relates to buying or selling via the Internet. Increasingly you can purchase directly via a Web site by selecting the goods or services that you require and entering your credit card details. Credit card details **SHOULD** be encrypted by the site operators so that no one can intercept your details. Still, you can never be 100% sure that the goods you bought will be given or that the site is a genuine one.

E-banking - Relates to managing your money online. Instead of having to go to the local branch, or telephoning them, you can pay your bills online and move money from one place to another.

Shopping online - Most Internet based shopping sites use a virtual “shopping cart” system. As you browse the site you can add any products you want to purchase to your cart. Once you have placed items in the cart you can then move to the checkout stage. At the checkout you enter your name & address, select the type of delivery you want and enter your payment details.

Advantages of E-commerce:

- Services available 24 / 7
- Large stock range
- Detailed product information
- Ability to compare prices
- Equal delivery to town and country
- Right to return defective goods (Returns Policy)

Disadvantages of E-commerce:

- Possible Credit card Fraud
- Fake websites
- Returning faulty goods
- Real person contact

Virtual Communities

Social Networking Websites - Social networking refers to a broad class of web sites and services that allow you to connect with friends, family, and colleagues online, as well as meet people with similar interests or hobbies.

Internet Forums - Online forums, usually threaded, where users can post comments on a variety of topics.

Online Computer games - Refers to games that are played over some form of computer network.

Security:

Information security - This is a general term that covers all aspects of computer security. It covers protection against viruses and hackers, password and access control policies as well as procedures for the regular backing up of your data (to guard against computer failure)

Passwords – Prevents other users from accessing the information you protected with a password.

Encryption – Encodes the information in such a way that if the user gives an incorrect password, data will be converted and interpreted incorrectly.

Shutting down your computer - When we just switch off the computer or lose power due to a power cut data can be easily lost or damaged. To protect against this we should save your work regularly and shut down the system in a proper way to make sure that all the data is saved properly.

UPS - This is a device that we attach to our computer to guard against instable electricity supply or power cuts. It contains batteries that will keep your computer on long enough for us to use the shutdown command and turn off the computer in the proper way.

Other factors – Good ventilation, Clean & Dust/Moisture free environment, Stable (vibration free) environment.

Backups:

Complete Backup – A complete backup means that you backup all the data on your computer. This has the advantage that the entire hard disk can be backed up, but can take a long

time if your computer contains a lot of data.

Incremental Backup – An incremental backup means that once a week you can perform a complete backup, but every night for the rest of the week, you only backup files that have been newly created or modified since the last backup, saving time.

Off-site storage – Backups should be stored in an other building at a safe location. At the very least, we should consider storing our backups in a fireproof safe, which gives some protection against fire damage.

Backups & Security – Backups should also be secured against any illegal attempts to get access to the data.

Security problems:

- Sudden & unexpected computer break down.
- Physical presence of unauthorised persons in an office – Use Visitor Control which prevents physical access
- Suspicion of unauthorised electronic entry in the computer networks
- Using unauthorised devices on the network – USB drives to copy data
- Leakage of user names and passwords.

Disposing of data:

- Floppy disks – Delete & destroy physically
- Hard Disks – Delete & destroy physically or overwrite (Shred data)
- Old computers – Destroy physically
- Paper Output – Shred before disposing

Computer Viruses:

Computer Viruses - Viruses are small programs that hide themselves on your disks (both diskettes and your hard disk). Unless we use virus detection software the first time that we know that we have a virus is when it activates and carries out its dirty work – Infect, damage, deletes and corrupts our files & system. Viruses hide on a disk and when you access the disk (either a diskette or another hard disk over a network) the virus program will start and infect your computer. The worst thing about a computer virus is that it can spread from one computer to another, either via use of an infected disk, or over a computer network – through E-Mail, Internet connection, Software Downloads, Chat etc.

Anti-virus products – These products check out your system for KNOWN viruses. If they find any virus usually these products first attempt to Clean it (Disinfect), then Deny Access and if also this fails it tries to Delete it. The main thing about anti-virus products is that it should be kept up to date. Many companies supply automatic updates on a regular basis via the Internet.

Copyright & the Law:

Software Copyright Issues - Most programs that we purchase are copyrighted and we must not copy them. If we do so we may be breaking the law and if caught, we could find ourselves being prosecuted. Copies of games are also normally unlawful. Even lending your program disks or CD-ROM to other people may be breaking the law in most cases. Most text that we find on the Internet is copyrighted. Never copy text without authority to do so and always quote your sources.

Site Licenses – Large organisations, instead of buying a number of copies of the same program, they will buy a site license. These site licenses mean that the companies purchasing the license can make a fixed numbers of copies available to their staff.

Downloads – We need to be VERY careful when downloading files from the Internet. Just because a site may say everybody is free to download materials from the site, does not necessary mean that the owners of the Internet site have the authority to allow you to do this. It is possible to download entire software packages from the net, even entire movie films. In many cases however it is not legal to do so.

Copying diskettes / CD-ROMs / DVD: If we purchase software on disk, or data such as a clipart library, we may, in most cases be allowed to make a single, backup copy of disk. But we are not allowed to distribute copies to family and friends.

Freeware: This is software that can be copied or downloaded for free. It is often fully functional and may be copied or redistributed. Obviously it cannot be sold!

Shareware: This is where you can use software for a free trial period. Shareware versions may be fully functional, but after a time period will either start to display an annoying message to register or in some cases it may stop working after the trial period.

User Licenses: If we have more than one PC, then we can either purchase a separate copy of the software we require for each PC, or better; we can purchase a user license. This user license allows us to make copies and install them on each computer.

Copyright Protection Schemes:

Product IDs – A serial number printed on the box/container of the software package.

Passwords/Codes – Before installing, the product asks for a word which is printed in the manual or package of the original product.

Activation Codes – By inserting a code, the code is checked and verified with the software supplier through the Internet and if valid, the software will continue the installation process.

Data Protection Legislation:

Data Protection & Privacy Issues - If a computer system holds information about individuals then the users have a moral and legal duty to treat that information with respect. For example doctors, government departments and credit agencies often hold vast amounts of information about the general public, which is both sensitive and private.

In a free society you have the right to ensure that the information held about you is correct and is not abused (used for other purposes without permission).