Course Name	**: Information Technology**
Course Code	**: APBPH 2101**
Course Level	**: Level 3**
Credit Unit	**: 4 CU**
Contact Hours	**: 60 Hrs**

Course Description
This Course is built on the previous acquired knowledge of Computer applications through theoretical lecturers and laboratory sessions. The course explores systems development life cycle (SDLC), describing the data processing cycle, data processing, security issues & concerns in systems protection of its information, office automation, data base management system (DBMS)

Course Objectives
· To expose students to practical knowledge of developing information and database system for organizations and business firms.
· To enable understand how information and data is processed through an automated cycle.
· To help them develop skills in data entry and retrieval within different computer systems.

Course Content
Systems Development Life cycle (SDLC)
· Stages involved in the SDLC include; Problem identification, feasibility study, systems investigation, systems analysis, systems implementation, systems implementation, review and maintenance

Data Processing Cycle
· The input function
· The processing function
· The output function
· The storage function

Data processing operations
· Batch processing
· Real-time processing
· Features of a storage and retrieval system

Security issues/ concerns
· Risks to the computer users
· Risks to hardware
· Physical Access control
· Risks to storage media
· Risks to data

· Best password practice(BPP)
· Telecommunications dangers
· Encryption and other safety measures on telecommunication

Data Base Management systems (DBMS)
· Definition of DBMS
· DBMS structures
· Application program
· Elements of a DBMS
· Facilities offered by database management systems
· Benefits of a DBMS
· Designing a database
· Verification and validation checks

Office Automation
· Spread sheet
· Features of spread sheets
· Word processing
· Microsoft Access
· Internet

Mode of delivery Face to face lectures
Assessment
Coursework 40%
Exams 60%
Total Mark 100%

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COMPUTER TECHNIQUES

CHAPTER FIVE

SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC)

5:0 INTRODUCTION

Under this Chapter we shall look at the following:
- Feasibility study
- Systems investigation
- Systems analysis
- Systems design
- Systems implementation
- Review and maintenance

A company or an organisation of any sort will normally have a strategic plan.
This strategic plan could be probably increasing sales by say 30% in the next 5 years.

When such a plan is in place, departments in the organisation will also set their strategies, to ensure that they contribute as required to the overall strategic plan. These departments may include; Production, Marketing, Sales, IT, Human Resource, etc.

Definition
A strategy is a general statement of a business's long-term objectives and goals and the ways by which these will be achieved.

5:1 THE IT STRATEGY

This will always deal with the organisational needs from IT, the organisation's current use of IT and the potential opportunities that IT can bring.
During the evaluation of current use of IT in the organisation, Gaps (differences) can be identified. E.g. does the system meet the desired requirements, are users happy, is the system reliable, etc.

5:2 STAGES IN THE SYSTEMS DEVELOPMENT LIFE CYCLE

This is the cycle that any system, which can be used in an organisation, can be developed through. It is called a cycle because the stages involved in the development will always be continuous and repeat themselves in the same way.

The stages involved in the systems development life cycle include the following in their order

- Problem identification
- Feasibility study
- Systems investigation
- Systems analysis
- Systems design
- Systems implementation
- Review and maintenance

Definition

A system is a collection of activities and elements organised to accomplish a goal.

A computer information system (CIS) is a collection of hardware, software, people procedures and data that work together to provide information essential to running an organisation.

Life cycle -This implies t hat the system changes continually, in other words that, development of computer information system within an organisation is an ongoing activity.

PROBLEM IDENTIFICATION

The SDLC typically begins by identifying a problem or need. It involves a preliminary investigation of a proposed project to determine the need for a new information system.

An end user usually requests this or manger who wants something done that is not presently being done.

The exact problem or flow in the system should be known e.g. slowness resulting in the incompetence of the system, too heavy work than is manageable effectively by the system and areas of poor performance being identified by management which increase the level of indirect expenses.

Possible plans or suggestions with alternative arrangements to the present ones are then forwarded to management in a report - to decide whether to pursue the project further.

If so then management hands the terms of reference to the system analyst. Once the analyst get a go ahead, he conducts a feasibility study within the limits of the terms of reference.

FEASIBILITY STUDY

This is a forma study to decide what type of system can be developed which meets the needs of the organisation.

It involves a brief review of the existing system and the identification of a range of possible alternative solutions.

The systems analyst here will estimate the costs and benefits of the systems with greater accuracy.
The alternative that promises a significant return on the investment will be accepted.

Feasibility study comprises the following:
- Technical feasibility
- Operational feasibility
- Financial feasibility
- Economic feasibility
- Social feasibility or organisational feasibility

1. Technical feasibility

The requirements, as defined in the feasibility study, must be technically achievable. This means that any proposed solution must be capable of being implemented using available hard ware, soft ware and other equipment.

2. Financial feasibility

The certified public accountant will have an in depth role to play at this stage in proceedings. The economic contribution of the whole system must be assessed.

At this level, the cost-benefit analysis will be carried out on all the possible alternatives, to identify the one with best returns.

There are three principal methods of evaluating a capital project

i) **Payback Period**

This method of investment appraisal calculates the length of time a project will take to recoup the initial investment - that is, how long a project will take to pay for itself. The method is based on cash flows.

ii) **Accounting Rate of Return**

This method, also called return on investment, calculates the profits that will be earned by a project and expresses this as a percentage of the capital invested in the project. The higher the rate of return, the higher a project is ranked. This method is based on
accounting results rather than cash flows.

iii) **Discounted Cash Flow (DCF)**
This method can be sub divided into two

♦**Net Present Value (NPV)**
This considers all relevant cash flows associated with a project over the whole of
its life and adjusts those occurring in future years to 'present value' by discounting at a rate called the 'cost of capital'.

♦ **Internal rate of return (IRR)**
This involves comparing the rate of return expected from the project calculated
On a discounted cash flow basis with the rate used as the cost of capital. Projects
with an IRR higher than the cost of capital are worth undertaking.

3. Organisational feasibility
The culture of the organisation, its structure, working practices, behavioural patterns and social systems need to be considered.

After the outlined project specifications are prepared these are presented to users who, with the assistance of technical staff will evaluate each option and make a final choice.

The results of this are included in a feasibility report.

SYSTEMS INVESTIGATION
The systems investigation is a detailed fact finding exercise about the area under consideration.

The following will be considered here by the project team;
♦Determine the inputs, outputs, processing methods and volumes of the current system
♦Examining controls, staffing and costs and also reviews the organisational structure.
♦Also considers the expected growth of the organisation and its future requirements.

The stages involved in this phase of systems development are as follows:

a) Fact finding by means of questionnaires, interviews, observation, reading handbooks, manuals, organisational charts.
b) Fact recording using flow charts, decision tables, narrative descriptions, etc.
c) Evaluation, assessing the strengths and weaknesses of the existing system.

Methods used in obtaining facts about the existing system:

♦Interviews
If interviews are conducted effectively, they allow the interviewer to provide information as well as obtain it. This method is the most appropriate for senior management, as other approaches may not be appropriate at executive levels.

♦Questionnaires
The use of questionnaires may be useful whenever a limited amount of information is required from a large number of individuals, or where the organisation is decentralised with many 'separate entity' locations. Questions are normally set in such a way that each one is equal to another and the evaluation is done by simply adding the number of 'yes' and 'no'.

♦Observation
Here the investigator simply observes/watches the procedures as they occur. The problem here is that people normally tend to behave abnormally especially if they know that they are being watched.

♦Document Review
The systems analyst must investigate the document that are used in the system., e.g. organisational charts, procedures mammals and standard operational forms.

The overriding risk is that staff do not follow documented policies and procedure or that these documents have not been properly updated, so this method is best used within other techniques.

SYSTEM ANALYSIS
At this phase, a full documentation of the current system, oftenly using data flow diagrams is done. The ways in which the system can be changed to improve it are then considered, and diagrams are redrawn to reflect the required system.
Definition

A data flow diagram is a recording of the ways in which data is processed, without bothering with the equipment used.

SYSTEMS DESIGN

This involves the detailed systems specification draw up.
The selection of the suitable hardware, software and any required human - computer interface is done at this level.

Hard ware
In general terms, the choice of computer hardware will depend on the following factors:

♦User requirements - will the hardware suite in with the user's requirements.
♦Power - the computer power should be sufficient for the current and future requirements.
♦Reliability - there should be a low expected 'break down' rate. Back-up facilities should be available.
♦Simplicity - simple systems are probably best for small organisations.
♦Ease of communication - the system (hard ware and soft ware) should be able to communicate well with the user.
♦Flexibility - the hardware should be able to meet new requirements as they emerge, especially more powerful CPUs.
♦Cost - it must be affordable.

Soft ware
There are several points to consider while choosing a suitable package. They include the following:
♦**User requirements**
Does the package fit the user's particular requirements? E.g. report production, anticipated volume of data, etc.
♦Processing times
Is the processing times fast enough?
♦Documentation
The documentation should be full and clear to the user e.g. the manuals should easily be understood.
♦Controls - what controls are included in the package e.g. pass words, data validation checks, spell checks, etc.
♦Compatibility - will the package run on the user's computer?
♦Support and maintenance - what support and maintenance services will the software supplier provide?
♦User friendliness
Is the package easy to use? E.g. with means and clear on-screen prompts for

the Key board operator.

♦Cost

Comparative costs of different packages should be a low priority. The company

Should obtain what it needs for efficient operation. Off-the-shelf packages are a

little cheaper that tailor made packages (bespoke).

A key question regarding software is whether to develop a system specially or buy what is already available (off-the-shelf)

Bespoke Packages

These are designed and written either 'in-house' by the IS department or externally by a software house. They are normally developed according to the customer specifications.

Off-the shelf packages

These are packages that are developed and sold to lots of users and intended to handle the most common user requirements.

Advantages of bespoke packages include:

i) The company owns the software and may be able to sell it to other potential users.

ii) The company can be able to do things with its software that competitors cannot do with theirs.

iii) It is likely that the package will be able to do all that is required it to do both now and in the future.

Disadvantages

a) The soft ware may not work at all.
b) There may be long delay before the soft ware is ready.
c) The cost is relatively high compared to off-the-shelf packages.

Advantages of using off-the shelf packages

a) It is available now and ready for use.
b) It is almost certainly cheaper than a specially commissioned product.
c) Expected high quality because software specialist writes them.
d) The software manufacturer will continually update a successful package, and so the version that a customer buys should be up-to-date.
e) Other users will have used the package already, and a well established package should be error-free.
f) These packages (good) are usually well-documented with easy to follow user manuals.

Disadvantages

a) A computer user gets a standardised solution to a data processing task. This may not well suite in the individual user's particular needs.
b) The user is dependent on the supplier for maintenance of the package.

c) There is always no competitive advantage as the competitors can use the same package.

Systems prototypes are likely to be developed here.

Definition

A prototype is a diagrammatic representation of the actual proposed system. It includes the number of hardware required, its configuration, information flow, staff, etc.

SYSTEMS INSTALLATION AND IMPLEMENTATION

Under this phase, the following stages are normally followed;

a) Installation of hardware and software
b) Testing
c) Staff training and production of documentation
d) Conversion of files and database creation
e) Change over

The items/stages in the list above do not necessarily happen in a set chronological order, and some can be done at the same time - for example staff training and system testing can be part of the same operation.

Installation of equipment

Installing a mainframe computer or a large network is a major operation that is carried out by the manufacturer/supplier.

Installation of a PC and other peripheral equipment will need a little bit of planning.

♦They should not be put in small, hot rooms since they generate some heat.
♦Large desks may be advisable, to accommodate a screen and keyboard and leave some free desk space for the officer worker to use.

♦There should be plenty of power sockets-enough to meet future needs as t he system grows, not just immediate needs.
♦If noisy printers are being purchased, it may be advisable to locate these in a separate printer room to cut down the noise for office workers.
♦There should be a telephone near the computer, for communicating with the dealer that provides systems support and advice if there is a problem.
♦The cabling for network connections should consider possible future changes in office key out or in system requirements.

After the installation of hardware, then software can be installed too. The can be done very fast there days since software is available on CD-ROMs and DVDs.

Back up copies of the software may also be got.

Testing
Programs must be thoroughly tested as they are being written and the whole system should also be thoroughly checked before implementation, otherwise there is a danger that the new system will go live with faults that might prove costly.
'Test data' is normally used here.
Test data is fed into the computer/new system and the results from the new system are compared with the already existing/pre-determined results from the old system.
Any deviations can be used to make decisions as to whether the system has passed or failed the test.

Training and documentation
Staff training in the use of information technology is as important as the technology itself. There is no use in having it if people don't know hoe to use it. This can be done through, lectures, discussion meetings, handbooks, trials/tests, internal company magazines, courses, manuals, etc.

Conversion of files
This means converting existing files into a format suitable for the new system.
Large organisations may use conversion software to change over:

Once the new system has been fully and satisfactorily tested, the change over can be made. This may be according to one of four approaches.
♦ Direct change over
♦Parallel running
♦Pilot tests

♦ 'Phased' or 'Stayed' implementation

Direct change over
This is the method of changeover in which the old system is completely replaced by the new system in one move.

This may be unavoidable where the two systems are substantially different, or where extra staff to over seed parallel running are unobtainable.

It is very cheap, but very risky as well and it is best used in business slack periods e.g. Christmas, holidays, etc.

Parallel running
This is a form of changeover where by the old and new systems are run in parallel for a period of time, both processing current data and enabling cross checking to be done.

It is a bit safe (less risky), but if the two systems are different, then cross-checking may be hard or impossible. Also, there is a delay in the cultural implementation of the new system and also a need for more staff to run the two system - an indication of high expenses.

Pilot Operation
This may involve a complete logical part of the whole system being chosen and run as a unit on the new system. If that is shown to be working well, the remaining parts are then transferred.

Gradually the whole system can be transferred in this piece meal fashion.
This method is cheaper and easier to control than parallel running, and provides a greater degree of safety than does a direct change over.

Phased Implementation
This involves a parallel running or direct change over done to a system of a particular section, say a branch of a company.

This method is suitable for very large projects and/or those where distinct parts of the system are geographically dispersed.

At this phase/stage (systems installation) of the SDLC, the internal auditors role is usually very important, especially during the testing of the new system.

This is because the facts he obtains at the testing stage can be used in future evaluation of the system and any audits that may be carried out.

A reference can always be made to the facts generated by the auditor at the testing stage to ensure there are no illegal amendments to the system.

SYSTEMS MAINTENANCE AND REVIEW

Maintenance

This is geared towards keeping the system running smoothly and achieving the intended goals.

There are three types of maintenance activities,

- Corrective maintenance
- Perfective maintenance
- Adaptive maintenance

Corrective maintenance

Is carried out when there is a systems failure of some kind, for example in processing or in an implementation procedure. Its objective is to ensure that systems remain operational.

Perfective maintenance

Is carried out in order to perfect the software, or to improve software so that the processing inefficiencies are eliminated and performance is enhanced.

Adaptive maintenance

Is carried out to take account of anticipated changes in the processing environment. E.g. the new taxation legislation might require change to be made to payroll software.

Post Implementation Review

This is devoted to uncovering problems in the system so as they can be fine tuned. Also it reviews t he activities involving methods used in developing the system. It is of two steps:

- **Development review**

Here the problems that arose during the development phases of the life cycle are analysed. Major discussions focus on expenditure and the period taken to complete the new system. Positive or negative variances in the expenditures are analysed. Mistakes resulting to negative variances are noted and are unlikely to be repeated in the future like wise positive variances.

Also mistakes that led to the delay are noted and avoided in the future.

♦Implementation Review

This step investigates the specific successes and problems of system operations.

These activities take some time after systems implementation say 1½ years. It is

intended to ensure that the system meets the desired goals it was implemented

for.

In summary still, the systems development life cycle follows these stages and it is very examinable.

1. Problem identification
2. Feasibility study
3. Systems investigation - detailed
4. Systems analysis
5. Systems design
6. Systems implementation
7. Systems maintenance and review

Question:

a) In the SDLC, which stage go you think directly involves a certified public accountant like you, and what would you be required for?
b) Describe for methods of system change over.
c) Distinguish between off-the shelf and bespoke software.
d) What is feasibility study?

CHAPTER SIX

THE DATA PROCESSING CYCLE

6:0 INTRODUCTION

Under this Chapter we shall look at the following:

- ♦Processing cycle
- ♦ Processing operations
- ♦Storage and retrieval systems
- ♦Classification of files

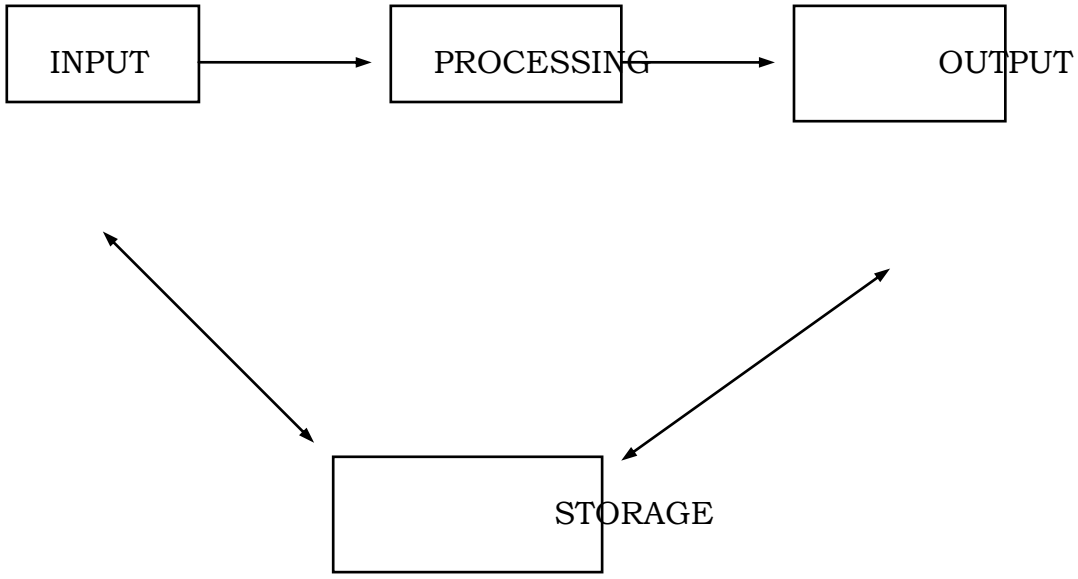
6:1 DATA PROCESSING CYCLE

Data processing, whether it is done manually or by computer, follows a cycle of input, process, output and storage.

Data processing is the acquisition, arrangement, storage and maintenance of data. The use of the computer is just to speed up and allow the use of complicated models compared to other methods.

A cycle refers to a sequence of activities performed in order, that produces expected dependable results.

The DP Cycle



The input function;

This involves gathering/collecting needed data items and entering the items into the information system for processing. This is done by the computer input devices.

Inputs can come from multiple sources. The quality, accuracy and completeness of data will affect the quality of the resulting information.

The processing function
This involves any method for using, handling, processing operations transforms transform data into meaningful information.

Processing creates new information which in turn is returned to files for updating and, or communicated to people.

The output information
Output delivers the results of processing i.e. information which can in turn be communicated to the people known as users of computers or information. This is normally done by the output devices.

The storage information
An information system needs a massive supply of data records and files. In this sense, storage is a vital part of an information system. The storage function also involves updating files to incorporate processed data. Storage can be done into the various types of storage peripherals that you already know.

6:2 DATA PROCESSING OPERATIONS

Files are used to store data and information that will be needed again in future or for the current use.
A file is a collection of records with similar characteristics.

The main types of data processing operations involving files are file updating, file maintenance and file enquiry or file interrogation.

Both manual and computer data processing can be divided into two broad types:
- Batch processing
- Real-time processing

Batch Processing
This is the processing as a group of a number of transactions of a similar kind which have been entered over a period of time to a computer system. Data is entered first, and then gets processed at a go as a group.

E.g. you may enter all the names into the system and then command it to arrange them in alphabetical order.

Transaction is any updating work on a database file. This can include entry of a new record, amending a record, deleting a record, etc.

Real-time processing
This is the continual receiving and rapid processing of data so as to be able or more less instantly to feed back the results of that input to the source of the data.

Real-time processing uses an 'on-line' computer system to interrogate or update files as requested rather than batching such requests together for subsequent processing.

On-line
On-line refers to a machine, which is under the direct control of the principal central processor for that hardware configuration.

Modern computers such as PCs are on-line by definition and likewise PCs in a network have permanent access to the server.

6:3 FEATURES OF A STORAGE AND RETRIEVAL SYSTEM

Whatever form documents and recorded information take, if they are to be of any use, they must be kept in a suitable way so that:
a) Authorised people can get to the information they require quickly and easily;
b) Information can be added to, updated and deleted as necessary;
c) Information is safe from fire loss or handling damage as long as it is required;
d) Accessibility, flexibility and security are achieved as cheaply as possible.

Classification of Files
Accessibility is a key point. When information is filed, it has to be filed in such a way that its users know where it is and how to retrieve it later when it is needed.

This means having different files for different types of information, and then holding each file in a particular order. Information might be divided into categories and then held in a particular order within each category.

There are various ways in which information can be grouped together, or classified.
a) By name (for example correspondence relating to a particular person)
b) By geography (for example all documents relating to a particular country, area or city).
c) By subject matter (for example all document relating to a particular contract, transaction or problem).

d) By date (for example all invoices for a certain month or year).
e) By department (for example profits or costs for each department or employee of each department).

Once broad classifications are established, the material can be put into a sequence which will make individual items easier to retrieve.

Again there are various systems for arranging files

a) Alphabetical order - for example customers listed in name order
b) Numerical order - for example invoices listed in numerical order of invoice numbers.
c) Alpha-numerical (A1, A2, A3, B1, B2, and so on).
d) Chronological order -f or example letters within a subject file listed by the date they were written.

CHAPTER SEVEN

SECURITY ISSUES

7:0 INTRODUCTION

Under this topic we shall look at the following,

- Risks to the computer user
- Risks to hardware
- Physical access control
- Controls over personnel
- Risks to storage media
- Risks to data
- Back-up procedures
- Telecommunication risks

A computer system consists not only of hardware, software, data and procedures but also of people.

Because of people, computer systems may be used for both good and bad purposes.

7:1 RISKS TO THE COMPUTER USER

If you have ever worked for long periods at a computer, you may have experienced some discomfort. This might have been caused by your use of the screen or the keyboard.

The VDU

If the screen is too bright, it can cause eyestrain. There are two ways of dealing with the problem. The first is to turn down the brightness; all monitors have a brightness and a contrast switch.

The second is to fit some kind of anti glare filter. All VDUs must have a swivel and tilt capability.

The physical health matters related to computer that have received the most attention recently are the following:-

1. Eye strain and headache

VDUs require using the eyes at close range for a long time, this can create eye strain, headaches and double vision.

And this is normally when the screen is too bright. To avoid this, take a 15 minute break every hour or two. Turn the brightness down.

Use of special anti-glare screen coatings and glare filters. Keep everything You are focusing on at about the same distance e.g. the screen, key board, document holder containing your work.

Clean the screen of dust from time to time.

2. Back on neck pain

Many people work at VDU screens and key boards that are in improper positions resulting in back and neck pain.

To avoid such problems;

♦Make sure the equipment is adjustable. Your chair should be adjustable for height and angle and should have good back support.

♦The table on which the monitor stands should be adjustable.

♦The monitor should be detachable.

♦ Document holders should be adjustable.

3. Electro magnetic fields effects

Like many household appliances, VDUs generate invisible electro magnetic fields (EMF) emissions which can pass through the human body.

Recommendations include;

♦Use of low emission monitors.

♦Computer users should sit 2 feet or more from screens and at least 3 feet from neighbouring terminals, as the strongest fields are emitted from the sides and back sides of terminals.

♦Use of glare filters which also reduce the emissions getting to an individual from the screen.

Repetitive Strain Injury (RSI)
Data entry operators in some companies may make as many keystrokes a day as possible. Some have fallen victim to a disorder known as RSI. This name is given to this disorder, which results from fast repetitive work that can cause neck, wrist, hand and arm pains.

Avoidance of RSI includes;
- Taking short rest breaks
- Getting plenty of sleep and exercise
- Loosing weight, sitting straight
- Learning stress management techniques

Other computer health risks include:
- Injury from electric shock

7:2 RISKS TO HARDWARE
Threats to hardware security are computer crimes including virus, electronic break-ins and natural, etc. Keeping information private in part depends on keeping computer systems safe from criminal acts, natural hazards and other threats.

Physical Threats

Fire and Flood
Fire is the most serious hazard to computer systems. Destruction of data can be even more costly than the destruction of hardware.

A fire safety plan is an essential feature of security procedures. It includes;

- Site preparation - appropriate building materials, fire doors, etc.
- Detection - e.g. smoke detectors
- Extinguishing - e.g. sprinklers
- Training staff in observing fire safety procedures e.g. the smoking in computer rooms

Water is a serious hazard. Flooding and water damage are often encountered following fire fighting activities else where in a building.

This problem can be countered by water proof ceiling and floors together with provision of adequate drainage. In some areas, floods are a natural hazards and therefore basements are generally not regarded as appropriate sites for computers.

Weather
The weather may be a threat. Wind, rain and storms can all cause substantial damage to buildings. Lightning and electrical storms pose an additional threat, as they can play havoc with power supply, causing power failures and power surges.

One way of combating this is by the use of un interrupted (protected) power supplies (UPS) Power failure may be solved by obtaining a separate generator.

Theft
Office break-ins are common. This can be combated by use of burglar proof windows and doors, etc.

7:3 PHYSICAL ACCESS CONTROL
The way to minimise many of the risks discussed in the above section is to introduce a series of physical access controls, to prevent intruders getting near the computer equipment or storage media. Methods of controlling human access include:

- Personnel (Security guards)
- Mechanical devices (e.g. keys, whose issues is recorded)
- Electronic identification devices (e.g. card-swipe systems, where a card is passed through a reader.

Personal identification numbers (PINs)
In some systems, the user might have a special PIN, which identifies him or her to the system. According to what the user's PIN is, the user will be allowed access to certain data and parts of the system but forbidden access to other parts.

Door locks
Connectional door locks are of value in certain circumstances, particularly where users are only required to pass through the door a couple of times a day. If the number of people using the door increases and the frequency of use is high, it will be difficult to persuade staff to lock the door every time they pass through it.

The major difficulty with this is the fact of key control. And the solution would be installing a combination door lock. This is where a numbered keypad is located outside the door and access allowed only after the correct 'code', or sequence of digits has been entered.

This will be effective if users keep the combination secret and the combination is changed frequently.

Card Entry Systems
This is a more sophisticated means of control than the use of locks, as cards can be programmed to allow access to certain parts of a building only, between certain times.

Security guards
These can be deployed at each entrance in the building to restrict access as may be required.

Video Surveillance
These (video cameras) are normally placed in certain strategic areas say corners, corridors, inside the rooms, etc. to cover any moving object. They are normally connected to a certain surveillance room of several TVs and a person to see the moving objects on TV.

7:4 CONTROL OVER PERSONNEL

Personnel Selection
The personnel who are to operate in the IT departments need to be fully scrutinised at the recruitment state and after recruitment, they need to be managed properly.

Controls related to personnel include the following:
i) Checks and balances so that a security violation must pass through several steps before being implemented.
ii) Segregation of duties (division of responsibilities)
iii)Job rotation so that employees change jobs at random intervals.
iv) Enforced vocations
v) Access to information granted not on rank in the management hierarchy or precedent, but on a need-to-know basis.
vi)Careful selection of personnel especially those to work in the IT departments.

Fraud
Computer frauds come from disgruntled employees, organised crime and hackers.
Networks make certain types of fraud easier; this is because many people/employees can have access to the computer system.

Two types of fraud can be identified

i)Single large-scale funds - usually the stealing of large amounts of money.
ii)Small-scale, but long-term frauds.

Examples of methods of fraud are given below:
i) Creation of fictitious supplier accounts and submission of false invoices, usually for services rather than goods, so that payments are sent to the fictitious supplier.
ii) Corruption and bribery, particularly where individuals are in a position of authority as regards making decisions or suppliers or selecting between tenders.
iii) Misappropriation of incoming cheques from bonafide customers.
iv) Theft of portable fixed assets.
v) Giving unauthorised discounts to customers.
i) Fictitious staff on the pay roll.

These frauds do not all involve computers in the commission, but many could be detected by appropriate use of computer controls, perusal of exception reports, analysis of expenditure ratios and the like.

7:5 RISKS TO STORAGE MEDIA

Handling floppy disks, CDs and tapes
Floppy disks and CDs should be handled with care just as you would treat a valuable CD with care.

i)They break when you bend them or you run them over with the castors of your chair.
ii) Spilling hot drinks over them and leaving them on sunny windows sills will damage them.
i) CDs should particularly be protected from dust, scratches and finger prints.
ii) For floppies write on the label before you stick it on to the disk and write only with a felt tip pen, never a ball point.
iii) Floppies are affected by magnets sot hey should be kept far from magnets.

Tapes can be snipped with scissors, or get knotted up, and they can also be damaged by magnets and heat and liquid. Treat them with the same care you would give to your favourite audio/video tape.

7:6 RISKS TO DATA

Risks to data can be in the form of deliberate or accidental:
i))Destruction (or alteration)
ii)Theft

iii) Unauthorised disclosure

There are therefore two types of controls used to restrict access.

- Physical access controls (analysed earlier)
- Logical access control

Basically logical access control consists of a password system. Data destruction can be protected against by taking back-ups and the risk of alteration of data minimised by a variety of basic precautions.

Passwords

Passwords are a set of characters, which may be allocated to a person, a terminal or a facility, which are required to be keyed into the system before further access is permitted.

Passwords can be applied to data files, program files and parts of a program.

i) One password may be required to read a file, but another to write new data to it.
ii) The terminal user can be restricted to the use of certain files and programs
(e.g. in a banking system, junior grades of staff are only allowed to access certain routine programs).

In order to access a system the user needs first to enter a string of characters. If what is entered matches a password issued to an authorised user or valid for that particular terminal the system permits access. Otherwise the system shuts down and may record the attempted unauthorised access.

Disadvantages of passwords

i)By experimenting with possible passwords, an unauthorised person can gain access to a program or file by guessing the correct passwords. This can usually be easy especially where users pick on to use obvious password like their names, etc.
ii) Some one authorised to access a data or program file may fell an unauthorised person what the password is, perhaps through carelessness.
iii)Many password systems come with standard passwords as part of the system. It is always better not to use such standard systems.
i) Passwords can be left in the open and any one gains access to them.

7:7 BEST PASSWORD PRACTICE (BPP)

These are points that have to be observed by computer users to whom passwords have been allocated.

♦Keep your password secret - don't reveal it to anyone.
♦Do not write it down as any body may come across it.
♦Change your password regularly.
♦Change and use your password discretely - some body can watch the movement of fingers to determine the password.
♦Do not use obvious pass words e.g. your name, etc.
♦Change your password if you suspect that any one else knows it.

7:8 TELECOMMUNICATIONS DANGERS

When data is transmitted over a network or telecommunications link (especially the internet) there are numerous security dangers.

a) i)Corruptions such as viruses on or single computer can spread through the network to all of the organisation's computers.
b) Staff can do damage through their own computer to data stored on other computers. E.g. transferring a file of the same name to the colleague's which may cause an over write.
c) Disaffected employees have much greater potential to do deliberate damage to valuable corporate data or systems.
d) If the organisation is linked to an external network, persons outside the company (hackers) may be able to get into the company's internal network, either to steal data, or to damage the system.
   Systems can have firewalls - these are used to prevent a particular network from intrusion from any other network e.g. a company network and the Internet.
e) Employees may down load inaccurate information or imperfect or virus-ridden software from an external network.
f) Information transmitted from one part of an organisation to another may be intercepted.
   Data can be encrypted (scrambled) in an attempt to make it meaning less to those who are not entitled for it.
g) The communications link it self may break down or distort data.

Encryption and other safety measures on telecommunication

♦Encryption involves scrambling the data at one end of the line, transmitting the scrambled data, and unscrambling it at the receivers end to the line.

Authentication

This involves adding an extra field to a record, with the contents of this field
Derived from the remainder of the record by applying an algorithm that has
previously been agreed between the senders and recipients of data.

Dial-back security

This operates by requiring the person wanting access to the network to dial into
it and identify themselves first. The system then dials the person back on their
authorised number before allowing them access.

Hacking

A hacker is a person who attempts to invade the privacy of a system. There are normally skilled programmers, and have been known to crack system passwords with consummate ease.

CHAPTER EIGHT

DATA BASE MANAGEMENT SYSTEMS

8:0 INTRODUCTION

Under this Chapter we shall look at the following:
♦Data base management system (DBMS) structures
♦Designing a data base
♦Verification and validation checks

8:1 DBMS STRUCTURES

Data within databases (or most other computerised filing systems) is organised in a specific hierarchy. The aim of the organisation method is to provide generally accepted and workable method of storing and accessing data in computer files. The basic concepts to be understood are as follows.

♦**Database** -stores information about the organisation within individual files
♦**File** - information concerning one aspect of the organisation, such as details of debtors.
♦**Record** - all the detailed information about one person or item within a file. E.g. in a debtors file, there will be information about the debtor.
♦**Field** - one item of data e.g. within the debtor's record this could be the debtor name.
♦**Byte** - one character
♦**Bit** - the smallest unit of computer storage - one area of memory, which can hold the value 0 or 1.
♦**Entry set/type** – Group of similar objects of concern to an organisation for which it maintains data transactions, courses, employees, students, non academic staff etc.
Meta data – is data used to define other data

Attributes – Characteristics of object category.
Entity- Basic units used in modelling.
Modelling – Some basic common functions.
Database – Collection of related files
Key - Single attribute
Primary key – unique entity identifier
Supper Key – Additional attributes to a primary key
Candidate Key – 2 or more attributes uniquely identifying an entity set

Secondary Key- An attributes/combination of attributes that may not be candidate keys but classifies the entity set
Meta data – Using data to describe/define data
External View of data – Highest level of application
Global view of data – lowest level of actual data storage

Naïve user

- Not aware of DB (Database systems)
- Responds by processing a coded Key
- Then operations are very limited

On-Line User

- Communicate with database directly via a user interface and application programme
- Aware of database system (DBS)
- Use data manipulation language
- Need additional help like merits

There are three basic database structures having different levels of sophistication hierarchical databases, network databases and relational databases.

As hierarchical and network data bases are rare these days, we shall confine on describing the relational model.

Relations Database

The concepts behind relational databases were developed by EF Codd of IBM.

The data is stored in tables, which are derived by a mathematical form of analysis on the sources of data for the system e.g. input screens, reports. In a relational database, data is split between different two-dimensional tables, which are linked together via a set of unique keys

Commercially available relational databases include IBM's DB2 and Oracle. Ms Access is also a relational database.

APPLICATION PROGRAMME.

- Are professional programmers
- Develop application programme user interface utilised by
- The naïve & online users
- Are programme written in general purpose programming language e.g. Assembler, COBOL, Fortran, Pascal etc.

DATA BASE MANAGEMENT SYSTEMS

Definition:
A database is a file (or files) of data so structured that many applications can use the file and update it, but which do not themselves constrain the file design or its contents.

This is of major benefits to the organisation including data sharing between applications.

DBMS
This is specialist software used to create and maintain a database.

Organisations collect and use vast amounts of data. One method of storing and accessing this data is to place it within one large store and use a DBMS to effectively control that data.

The DBMS is normally located between the main database of the organisation and the different applications that want to access and use that data.

Elements of a DBMS
A DBMS comprises three separate sections i.e.

a) Data Definition Language (DDL)
b) Data Manipulation Language (DML)
c) Data Dictionary

DDL is used to specify the content and structure of the database. The DDL defines the form of each item of data in the database so that the data can be accessed and used by the various application programs accessing the database.
Entry set/Type – Group of similar objects of concerned to an organisation for which it maintains e.g. data transactions, courses, employee, students, non-academic staff etc.

♦Defines the conceptual scheme
♦Curves details how to implement the conceptual scheme and stores data

DML is a specialist language used to manipulate data within the database. The DML is a fourth generation language.
♦Involves retrieval of data from the database
♦Inserts raw data into the database

The Data Dictionary is a program used to store and organise the data in the database. The dictionary stores key information about the data,

such as who uses the data, what the access rights to data are and who owns the data and is therefore responsible for updating it. Deletes and modifies existing data.

Facilities offered by database management systems

The DBMS will offer the following facilities:
a) The ability to add, amend and delete records
b) The ability to retrieve data
c) The ability to present data in different formats and combinations as required
d) The ability to control access to records by means of passwords and other security procedures
e) The ability to allow the database to evolve without requiring modification to applications programs
f) The ability to recover from systems break down and avoid data loss
g) The ability to record transactions and identify redundant data.

8:2 DATABASE ADMINISTRATORS (DBA)

Centralised control of data base under one controller that is sole administrator.
The DBA's work can be split into strategic and organisational activities.

a) Strategic Tasks
(i) Working with strategic management to help define the organisation's present and future needs.
(ii) Choosing suitable file structure for data storage.
(iii) Analysing the data required for each application.
(iv) Preparation of a data model.
(v) Preparation, modifying and maintenance of a data dictionary.
(vi) Defining hardware needs and plan for any change and internal levels.
(vii) Administrator of internal and external view of data (3 levels)
(viii) Specifies conceptual view of various users and applications
(ix) Defines and implements the internal level and storage structure
(x) Controls changes to external Global
(xi) Custodian and controller of database structure
(xii) Defines mapping between levels structures
(xiii) Okays users of the database and their dismissal.
(xiv) Fore sees the maintenance and preservation of the integrity of the database
(xv) Defines procedures to receive and recover the database system

b) Organisational Tasks
(i) Ensuring data integrity by implementing and controlling database procedures.
(ii) Production of operating manuals.

(iii) Provision of training for users and applications programmers on a regular basis.
(iv) Assessing the ongoing performance of the database.

Benefits/advantage of database filing systems
There are basically three major benefits from database filing system; i.e. integrity, independence and integration.

Integrity
Database integrity means that data is kept secure and that amendments are only made as effectively authorised by the DBMS.

Independence
The principle of independence relates the splitting of data away fro the programs that use that data.

Making this split ensures that;
♦Applications can be written and amended independently of the data they use, and
♦Amendments can be made to the data without having to amend all the different applications that use the data.

Integration
This refers to the maintenance of data in one location rather than spreading and possibly duplicating, that data around the organisation in separate individual databases.

8:3 BENEFITS OF A DATABASE MANAGEMENT SYSTEM (DBMS)

a) Integration of data needs
Data should be shared between the different applications using it. This can
mean That different applications using the DBMS can access the same data at
the same time.
b) Data security
Data should be accessible only to those authorised to see it, and should be
capable of modification only under controlled conditions.
c) Flexibility
The DBMS should allow for different uses with a range of applications.
d) Minimum redundancy
Duplication of data should be kept to a minimum. This achieves the benefit of
reduced space and avoids inconsistent data.

e) Evolutionary capability

The DBMS must be capable of evolving to adapt to changing organisational

Needs without requiring extensive modifications to application programs.

8:4 DESIGNING A DATABASE

Where an organisation uses a central database, it is crucial that the database operates effectively. This requires adequate hard ware, software and personnel, but most importantly it needs a well-designed database.

The main stages in design and use of a database are as follows;

a) Analysis of information needs
b) Logical design of the database
c) Physical design and set up of the data base
d) Data entry and upkeep
e) Data retrieval and reporting
f) Monitoring and maintenance

Analysis of information needs

In order to identify the information needs of the organisation, a fundamental understanding of its objectives is necessary.

a) The business plans of the company provide the basis of this understanding, identifying the organisation's critical success factors (CFS) and the information that is needed for these factors to be achieved.
b) An information audit will be carried out to identify the needs of particular users and groups of users.

Logical design of the database

a) The information gathering process will help to determine the data required on the database for existing and foreseeable future applications. This list of data is recorded in the data dictionary.
b) The rules relating different items of data together are determined.
c) The analyst will then determine the rules relating particular application to items in the database.

Physical design and set up of the organisation

The rules that have been specified are then programmed to support the database management system. This procedure is so specialised that it may require a special Data Description Language (DDL).

Data entry and upkeep

a) Data is added (or appended) to the database. Its integrity is ensured by validation and verification checks.

b) Existing data may be changed (or amended). This process will also be subject to validation and verification (see later in next section).
c) Existing data may be deleted from the database. This is normally a two-stage process, i.e. making and then physically deleting - this ensures that only intended data is deleted.
d) A specialised language called a Data Manipulation Language (DML) may be used to carry out the processes of addition, amendment and deletion.

Data Retrieval and Reporting
Most database systems provide a wide variety of ways in which data may be accessed and analysed.

a) Individual records may be retrieved and inspected.
b) Items may be retrieved according to a set of specific parameters.
c) Data may be sorted or indexed on any field or combination of fields. This makes lists and other outputs easier to use.
d) Simple summarises and calculations can be carried out on the data contained in the database.
e) Report generators are supplied with many databases management packages. This enables users to summarise and report data quickly and in an easily digested format.
f) A specialised language called a Structured Query Language or SQL may be used to retrieval and report information.

8:5 VERIFICATION AND VALIDATION CHECKS

The verification and validation checks have been designed to deal with the common human errors as regards data entry. This is in databases, accounting systems, spreadsheets, etc. So this means that these checks do not only apply to databases but also to accounting systems, word processors, spreadsheets, etc.

Verification is the process of ensuring that the data that has been input is the same as the data on the source document.

Validation is the process of ensuring that the data that has been input has a value that is possible for that kind of data. For example there is no month with 33 days.

Data Verification
The most common method of verification is encouraging staff to look for errors e.g. if data is input using a key board, it will be shown on the screen and visual checks on the data can be made.

Validation Checks

When a validation check identifies an error, the record concerned will probably be rejected and processed no further without correction. Rejection reports or massages will be displayed on a VDU screen.

Some of the data validation checks are outlined below:

♦**Range Checks**

These are designed to ensure that the data in a certain record field lies within

predetermined limits e.g. day of a month can be from 1 to 31 not 0 or beyond 31.

♦**Limit Checks**

These check that data is not above or below a certain value.

♦**Existence Checks**

These are checks to ensure that the data is valid within a particular system. E.g.

Checking items in stock.

♦**Format Checks**

These help to ensure that the format (and size) of the data in a field is correct.

E.g. check that the formal is all numeric or alphabetic, etc.

♦**Consistency checks**

These involves checking that data in one field is consistent with data in another

field. For example, in a payroll system, there might be a check that if the

employee is a Grade C worker, he or she must belong to department 5,6 or 9.

♦**Completeness Checks**

A check can be made to ensure that all records have been processed.

♦**Check digits**

This check is used to detect especially transposition errors.

Transposition errors are those that arise when correct digits in a figure, e.g.

123,907, are unintentionary interchanged, e.g. 132, 907.

CHAPTER NINE

OFFICE AUTOMATION

9:0 INTRODUCTION

Under this Chapter we shall look at the following:

- ♦Spreadsheet
- ♦Word Processing, DTP and Graphics
- ♦Communication
- ♦The Internet

Office automation tries to analyse the application programs that are normally used in offices and office communication.

9:1 SPREAD SHEET

A spreadsheet is a general-purpose software package for modelling. The name is derived from its likeness to a spreadsheet of paper divided into rows and columns.

♦A spreadsheet program can help you manage personal and business cash flow analysis and forecasting. General ledger, stock records, profit projections, sales projections, etc.
♦You can use the spreadsheet to perform calculations, analyse data and present information.
♦You can store large collections of information i.e. a mailing or product list.
♦Spreadsheets program include tools for organising, managing, storing and retrieving data-through a bigger control over a list stored on your computer would need a Database program.

Features of Spreadsheets

Cell is one box in a spreadsheet.
Column is a vertical line of boxes or cells. Each column is identified by a unique letter e.g. a,b,c, aa, ab, aaa, aab, etc).
Row is a horizontal lie of boxes of cells. Each row is identified by a different number (e.g. 1,2,3,11,12,13,111,112, etc).

Active cell (Current cell)

This identifies the location of each cell in a spreadsheet. It consists of a column letter followed by a row number.

Formula

In a spreadsheet, a formula helps you calculate and analyse data. When entering formulas cell references or cell addresses are used. E.g. [+D2+D4] instead of typing in the actual data whenever possible.

Calculations
Spreadsheet programs perform calculations using the following.
* - multiply, + - Add, - - Subtract, /- divide, / exponents.

Automatic Recalculation
Spreadsheets have a facility where by if you change a number used in a formula, all the other figures affected by the formula will change automatically displaying the new results.

This feature is so useful if you want to evaluate possible scenarios. E.g. how differently interest rates affect your mortgage payments.

Using parenthesis [ ]
In a formula, a spreadsheet program will calculate the data inside the parentheses then with those outside it. E .g. +A1 * [B6/B7] + A5.

Copying a Formula
After entering a formula in a spreadsheet, you can save time by copying a formula to other cells. The spreadsheet program will automatically change the cell references in the new formula for you.

Functions
A function is a ready-to-use formula that helps you to perform calculations e.g. sum, Average, Maximum, Minimum, etc.

Examples:
♦SUM [D1: D4] calculates the sum of the numbers in addresses D1 to D4.
♦AVERAGE [A6: A10] calculates the average value of the lists of numbers in addresses A6 to A10.
♦MAXIMUM[A2; A7] finds the largest value in the lists of numbers in addresses A2 to A7.

Facilities offered by a spreadsheet.

Editing
Data can easily be copied for moved from one part of the spread sheet to another using a mouse and cut and paste or drag and drop facilities.

♦Column width, row height can also be changed.
♦Rows and columns can be inserted and most operations can be reversed.

♦Modern spreadsheets can help you complete a series, e.g. type 'Monday' - it will type the rest up to Sunday.

Formatting a Spread sheet

This involves changing font (type style), number appearance, boarders, shading and colour. Data alignment centre left or right, etc. You can format the entire spreadsheet or a specified range of cells.

Charts and graphics

Most spreadsheets contain graphic and chart facilities which enable you illustrate data using a suitable chart type.

Sorting

Data can be sorted alphabetically or numerically.

File commands

Opening, naming, saving, printing and closing the spreadsheet file are the key tasks.

Potential problems/disadvantages of spreadsheets

Spreadsheets are immensely popular and can be used for a very wide range of modelling tasks. However, because they are essentially single - user packages and because each one is designed from scratch. There are risks in their use.

a) Although users are some times trained in how to use a spread sheet, they are rarely trained in spread sheet discipline or best practice. This means that spread sheets may be badly designed, increasing the risk of errors or inefficiency.

E.g. a user may put a second large table immediately below the first, rather than diagonally offset. If he or she then deletes a column of data from the first table, then data may be unintentionally lost from the second one as well.

b) Users are unlikely to document the workings of their spreadsheet, as they consider it 'obvious'. This makes it difficult for other staff to understand use or modify the model.

c) The lack of proper audit trail can be a disadvantage. Because the user works with a spreadsheet in memory (RAM), only saving it at certain intervals, it is unlikely that a record of the intermediate stages will be maintained, even if output from the intermediate stages is important.

9:2 WORD PROCESSING

WORD PROCESSORS
Word processing is the processing of text information. Typically word processing soft ware may be used for production of standard documents.

Features of a word processor
The following are some of the features of a typical word processor.

(i) Adding headers and footers
(ii) Inserting footnotes
(iii) Using different characters fonts in a variety of services.
(iv) Changing texts to bold italic, underlined, double underlined, etc.
(v) Spell checking - for spelling errors and in some programs checking for grammatical errors.

Some word processors especially modern one have additional features not available in older word processor e.g.
(i) Adding lines or boxes in a variety of width and style.
(ii) Inserting digitised photos and artwork.
(iii) Creating charts and tables with newly entered data or by linking to data that already exists in a data file.
(iv) Drug and drop editing.
(v) Creating a table of contents or index automatically.
(vi) Main merging - where automatic formats for different types of letter may exist.
(vii) Importing data from other -programs like spreadsheets.
(viii) Compatibility - where major packages are very similar and highly compatible e.g. a WordPerfect file may be opened, edited and saved in Ms Word.

9:3 DESK TOP PUBLISHING (DTP)
DTP is the use of office computers to implement computerised typesetting and composition systems. They can be used for producing master pages for a book, newspapers, leaflets, etc.

Graphics (Computer Graphics)
Another use of computers is the production of information in the form of pictures, diagrams or graphs. A widely used office package is corel draw.

9: 4MICROSOFT ACCESS
This is used to design data bases and create management reports.

9:5 COMMUNICATION
Under this topic, we shall see how telecommunication hardware is used in office work.

Telex

Telex is a service which enables users to transmit and receive printed message over a telephone line. Users have to be telex subscribers, with their own telex equipment and code number in order to send or receive messages.
Telex services started in the 1930's
Data transmission speeds are very slow with Telex as compared to other methods telecommunication and only restricted set of characters can be used in messages.

Fax (or Facsimile)
This involves the transmission of messages by a data link of exact duplicate copies of documents. The original is fed into the fax machine, which reads it and converts it into electronic form so it can be transmitted over the telephone.

It is printed by the recipient fax machine.
The latest fax machines can also be used to scan data into a PC, as printers for PC output and as photocopies.

Electronic Mail (E-mail)
The term 'electronic mail' or 'e-mail', is used to describe various systems of sending data or messages electronically via a telephone or data network and a central computer, without the need to post letters or place memos in pigeon-holes, etc.

E-mail has the following advantages
a) Speed E-mail is far faster than post or fax. It is a particular time saver when communicating with people over seas.

b) Economy (no need for stamps, envelopes, etc) it is far cheaper than fax or post.
c) Efficiency. Messages are prepared once but can be sent to thousands of employees at the touch of a button.
d) Security. Access can be restricted by the use of passwords.

Voice Mail
Voice mail systems enable the caller's message to be recorded at the recipient's voice mail box. It requires a telephone, and no keying or typing is necessary.
A voice mail message is basically a spoken memo.

THE INTERNET
The Internet is the name given to the technology that allows any computer with a telecommunications link to exchange information with any other suitably equipped computer.

Also Internet refers to the international network.

Web sites/page
As you are no doubt aware, most companies of any size now have a 'site' on the Net.
A site is a collection of screens providing information in multi media form (text, graphics and often sound and video), any of which can be viewed simply by clicking the appropriate button, word or image on the screen.

Internet Service Providers (ISPs)
Connection to the Internet is made via an Internet Service Provider (ISP). The user is registered as an Internet subscriber and pays a small monthly fee together with local telephone call charges. Examples of ISPs include American On-line (AOL), Spacenet in Uganda, Uganda Telecoms, etc.

Browsers and Search Engines
Browsers
These are programs that are used to run the internet. Example is Netscape Navigator.

Search Engine
These are used to guide the users surfing the net examples include, Yahoo! Aita Vista.

Uniform resource locator (Website address) (URL)

Each web page has a unique address called the uniform resource locator (URL)

All you need is type in the URL for the website you want to visit and enter.
An example of URL could be like http!//w.w.w.TBC.co.ug.

URL Element	**Explanation**
http!//	Hyper text transfer protocol, the portico used on the world-wide web for the exchange of documents produced in what is known as 'hyper text mark-up language (HTML). The forward slashes after the colon introduce the 'host name' such as www.
www	This stands for World Wide Web. As noted before, to put it simply the web (via its use of HTML), is what makes the internet user-friendly.

TBC	This is the domain name of the organisation or individual whose site is located at this URL.
Co	This part of the VRL indicates the type of the organisation concerned. The Internet actually spans many different physical networks around the world including commercial (Com or Co), schools (ac or edu) and other research networks (org, net) military (mil) net works, and government networks.
Ug	As you can possibly guess, this indicates that the organisation is located in Uganda commercial use of the Internet.

Marketing

Organisations used the Internet to provide information about their own products and services. Customers simply log on to the appropriate website and get to know the latest products on the market and so many other things.

Sales

Interactive electronic purchasing is possible with the Internet, the customer simply provides details of her/his credit card on the internet along with the order. This facility is not yet very common here in Uganda but its very attractive in Europe and America.

Distribution

The Internet can be used to get certain products directly into people's homes. Any thing that can be converted into digital form can simply be up loaded on to the seller's site and then down loaded onto the customer's PC at home. The Internet thus offers huge opportunities to producers of text, graphics/video and sound-based products. Much computer soft ware is now distributed in this way.

Other uses of the Internet

Entertainment

A variety of quality games are available on the net.

Information

On the net you can have access to information of any subject imaginable e.g. newspapers, magazines, job listings, airline schedules, college prospectus, movies, etc.

Discussion group
You can join discussion groups on the net to meet people with similar interests. You can ask questions, discuss problems and read interesting stories.

E-mail
Exchanging email is the most popular feature on the Internet. You can exchange e-mail on computers around the world.

Problems with the Internet
Being owned by no one, there are no clear guidelines on how the internet should develop. Today you can find the good, bad and different items on the net e.g. Bible preaching and phonography.

Employees of an organisation may spend so much time on the net surfing useless sites - thus wasting the organisation's useful time.

Lack of security on the Internet is another problem. This is especially with the e-mails - information such as credit card details is not communicated comfortably.

Cost is another major problem. You need a relatively high quality PCs, which are expensive; in addition, connection fees, access time fee and web site designing fees are also high.

With much less powerful equipment e.g. a slow modern and a slow processor, gaining access to useful information becomes slow and quiet painful.

Getting connected to the Internet

You need specific equipment and program to connect to the Internet.

1. Computer - any type of computer, which is relatively strong.
2. Programs - you need special programs to use the Internet e.g. e-mail programs, etc.
3. Modems - you need a modem to connect to the Internet. A modem of at least 14,400 bps is recommended.
4. Telephone line.

Other forms of the Internet

Intranets
This is an internal Internet, available to individuals with in a specific organisation.

The intranet is used to provide a relatively quick and easy method of providing and information sharing system in an organisation.

Extranets
This is an extension of the intranet where some third party access is allowed to the internal web sites.

Uses and benefits of the intranets
Allowing access to databases, no matter where they are located with in the organisation.

This helps to support the obtaining and sharing of information between worker throughout an organisation as well as minimise the need to keep the data in more than one place.

An intranet will allow the creation of on-line catalogues, handbooks, and directories that can be accessed and up dated as necessary e.g. an internal telephone directory for an organisation of say 100,000 employees world wide will change on a daily basis as a new staff are hired and existing staff leave.

Intranet will save the organisation costs in terms of printing and distributing the paper based manuals and handbooks etc.

Some intranets can be linked to legacy system allowing older corporate data to be obtained and analysed along side more recent transaction data.

Information is provided in a more user-friendly format, which helps encourage the use of the internet.

Training costs are limited because users will already be familiar with browser technology from using the Internet.

Uses and Benefits of the Extranets
They provide on-line information for customers and suppliers provide 'added value' to the products and services provided by the organisation.

Allowing authorised buyers of the organisations' products access to information about those products to help them decide which product is appropriate for a specific use.

Linking with existing EDI (Electronic Data Interchange) applications to provide full stock control, procurement and payment systems.
Full Meanings of the words as applied in information technology/system

LIST OF ABBREVIATIONS

ABBREVIATION	ABBREVIATION IN FULL
4.GL	Fourth Generation Language
ALU	Arithmetic Logic Unit
AOL	America on Line
AS II	America National Standard Code for Inform date Interchange
ATM	Automated Teller Machine
BASIC	Beginners All Purpose Symbolic Codes
BIOS	Basic Input – Output System
BIT	Binary Digit
BTM	Business Teller Machine
CD	Compact Disk
CIS	Computer Information System
CLS	Clear Screen
COBOL	Common Business Oriented Language
CPU	Central Processing Unit
CU	Control Unit
DBMS	Database Management System
DDL	Data Definition Language
DEEP BLUE	Computers are modern computers that are an IBM computer programmed to play Chess with the world class champion, Garry Kasorok. Programmed to make 1 million moves in a second, which defected the world chess champion in the world.
DEL	Delete
Dir	Directory
Disk Drives	Media where computer programme files reside e.g., Hard disks, floppy Disks, CD-ROM, Magnetic tapes etc.
DML	Data Manipulation Language
DOS	Disk Operating System
DPC	Desktop Personal Computer
Drives	External storage medium storage capacity more than floppy and less then hard disk drive, designed with letters D…E.
DTP	Desk top Publishing
DVD	Digital Video Disk
E-mail	Electronic Mail
EMF	Electronic Magnetic Fields
EPOS	Electronic Point of Scale

EWN	Enterprise Wide Network – Any Private Network connects all of organization CPS no matter what they run or where they are located.
Expansion Slots	are access slots on the C.P.U where new computer cards can be fixed when upgrading (expanding) a computer. When adding another floppy drive, adding a CD ROM Drive a higher memory chip.
Floppy Disks Drives.	External storage medium, less storage capacity than Hard disks drive designed with letters
FORTAN	Formula Transaction
GB	Byte
GUI	Graphical User Interface - medium through user interacts with a CP
Hard Disk Drive	Internal Storage mechanism stores most computer applications. Capacity 100MB designed work letters
HLL	High Level Language
IBM	International Business Machine
ILL	Intermediate Level Language
INTERNET	International Network
IRR	Internal Rate of Return
ISP	Internet Service Provider – Provides Internet to users who register at 15 P using other dial to dedicated access.
IT	Information Technology
KB	Kilo Bytes
KIPS	Kilo Instructions Per Second - its Speed
KISS	Keep it small Simple
LAN	Local Area Network
LLL	Low Level Language
MAN	Metropolitan Area Net – Work
MB	Mega Byte
MICR	Magnetic Ink Character Recognition
MIPS	Millions Instructions per Second
MODEM	Modulation Demolecular
MS DOS	Micro Soft Disk Operating System
Ms Excel	Micro soft Excel
MULT	Multiply
NPV	Net Present Value
NT	Net Work
OCR	Optical character Recognition
OS	Operating System
OUR	Optical Work Reading
PC	Personal Computer
PIN	Personal Identification Number

Ports	Are connections (sockets) on the C.P.U which a computer components (Device) like a printer, mouse, modern etc. Can be connected.
RAM	Random Access Memory
ROM	Read only Memory
SAN	Storage Area Network
SDLC	System Development Life Cycle
SSDM	Special Standard System Development management maintenance
SSM	Special Standard System Management/maintenance
SQL	Structured Query Language
SUB	Subtract
TCP/IP	Transmission Control Protocol/internet Protocol system used to transfer information from one computer to another.
UPS	Uninterrupted Power Supply
URL	Uniform Resource Locater
VAN	Value Added Network
VDU	Visual Display Unit
W.W.W	World Wide Website
Web Server	Software that delivers web pages and contains of web sites.

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Africa Population Institute
P. O. Box 10842, Kampala Uganda
Website: www.africapopulaation.net Email: info@africapopulation.net
Tel:+256-772/712/702-836998