NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF EDUCATION

COURSE CODE: BED313

COURSE TITLE:- OFFICE INFORMATION TECHNOLOGY

BED 313: **OFFICE INFORMATION TECHNOLOGY**

Course Team

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First Publication: 2015

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INTRODUCTION

BED 313: OFFICE INFORMATION TECHNOLOGY

This course is designed to equip the business students with the knowledge and skills relating to efficient functioning of the modern business offices and related organizations.

WHAT YOU WILL LEARN

You will learn about the structure, function and practices applicable to a modern business office.

COURSE AIMS

This course aims at producing competent business educators who will be versed in organisation management and acquaint them with the basic knowledge of office information technology that will be used in decision making. In order to enable you meet the above aims, modules constituting of units have been produced for your study. Apart from meeting the aims of the course as a whole, each course unit consists of learning objectives which are intended to ensure your learning effectiveness.

COURSE OBJECTIVES

The courses objectives are meant to enable you achieve/acquire the following:

1) Understand and gain in depth knowledge of information and communication handling procedure in the organisation.
2) Acquire knowledge and skill for handling office information and communication procedure.
3) Develop understanding and practical knowledge of information security in the organizations.
4) Understanding the basic concept of office automation.

WORKING THROUGH THIS COURSE

You are required to thoroughly work through all the units in this course. There are four modules in all.

COURSE MATERIALS

The major components of this course are

1. Course Guide
2. Study units
3. Text books
4. CDS
5. Tutor
6. Assignment file
7. Presentation Schedule

STUDY UNITS

The breakdown of the four modules and 14 study units are as follows:

MODULE 1 SYSTEM ADMINISTRATION

Unit 1 Present day office arrangement
Unit 2 Office environment
Unit 3 Types of office machine (manual and electronic gadget)
Unit 4 Information technology and information processing task

MODULE 2: INFORMATION AND COMMUNICATION HANDLING PROCEDURE

Unit 1 Management information system
Unit 2 Office automation
Unit 3 Computer security
Unit 4 Information systems disaster discovery alternative

MODULE 3 THE INFORMATION SYSTEMS INFRASTRUCTURE MANAGEMENT

Unit 1 Hardware
Unit 2 Software types and their capabilities
Unit 3 IT and E-Business Enabling Software
Unit 4 Managing people in the organization**.**

MODULE 4: INFORMATION SECURITY.

Unit 1 Information technology strategies
Unit 2 The future for information technologies

ASSIGNMENT FILE

You will find in this file all the details of the assignments you must attempt and submit to your tutor for marking. The marks you obtain from these assignments will count towards your final course grade. You will find further information on the assignments in the assignment file which you will find later in the section on assignment in this course Guide.

PRESENTATION SCHEDULE

The presentation schedule which is included in your course materials gives you the important dates for the completion of tutor-marked assignments and for attendance of tutorials. Remember, you are required to submit all your assignments on due dates. You should guard against falling behind in your work.

ASSESSMENT

Your assessment will be based on tutor-marked assignments (TMAs) and a final examination which you will write at the end of the course.

TUTOR MARKED ASSIGNMENTS (TMA)

Every unit contains at least one or two assignments. You are advised to work through all the assignments and submit them for assessment. Your tutor will assess the assignments and

select four, which will be marked and the best three will be selected which will constitute 30% of your final grade. The tutor-marked assignments may be presented to you in a separate file. Just know that for every unit there are some tutor-marked assignments for you. It is important you do them and submit for assessment.

FINAL EXAMINATION AND GRADING

At the end of the course, you will write a final examination which will constitute 70% of your final grade. In the examination which shall last for two hours, you will be required to answer three questions out of at least five questions that may be given to you.

COURSE MARKING SCHEME

This table shows how the actual course marking is broken down.

Assessment	**Marks**
Assignments	Four assignments. Best three marks of the four count as 30% of course marks
Final Examination	70% of overall course marks
Total	100% of course marks

HOW TO GET THE MOST FROM THIS COURSE

In distance learning, the study units replace the university lecture. This is one of the great advantages of distance learning; you can read and work through specially designed study materials at your own pace, and at a time and place that suits you best. Think of it as reading the lecture instead of listening to the lecture. In the same way a lecturer might give you some reading to do, the study units tell you when to read, and which are your text materials or set books. You are provided exercises to do at appropriate points, just as a lecturer might give you in-class an exercise. Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit, and how a particular unit is integrated with the other units and the course as a whole. Next to this is a set of learning objectives. These objectives let you know what you should be able to do by the time you have completed the unit. These learning objectives are meant to guide your study. The moment a unit is finished, you must go back and check whether you have achieved the objectives. If this is made a habit, then you will significantly improve your chances of passing the course. The main body of the unit guides you through the required reading from other sources. This will usually be either from your set books or from a Reading section. The following is a practical strategy for working through the course. If you run into any trouble, telephone your tutor. **Remember that your tutor's job is to help you. When you need assistance, do not hesitate to call and ask your tutor to provide it.**

IN ADDITION TO THE FOLLOWING:

1. Read this course Guide thoroughly, it is your first assignment
2. Organize a study schedule. Design a 'Course Overview' to guide you through the Course. Note the time you are expected to spend on each unit and how the assignments relate to the units. Important information, e.g. details of your tutorials, and the date of the first day of the Semester is available from the study centre. You need to gather all the information into one place, such as your diary or a wall calendar. Whatever method you choose to use, you should decide on and write in your own dates and schedule of work for each unit.
3. Once you have created your own study schedule, do everything to stay faithful to it. The major reason that students fails is that they get behind with their course work. If you get into difficulties with your schedule, please, let your tutor know before it is too late for help.
4. Turn to Unit 1, and read the introduction and the objectives for the unit.
5. Work through the unit. As you work through the unit, you will know what sources to consult for further information.
6. Keep in touch with your study centre. Up-to-date course information will be continuously available there.
7. Assemble the materials. You will need your set books and the unit you are studying at any point in time.

8. Well before the relevant due dates (about 4 week before due dates); keep in mind that you will learn a lot by doing the assignment carefully. They have been designed to help you meet the objectives of the course and,, therefore, will help you pass the examination. Submit all assignments not late than the due date.
9. Review the objectives for each study unit to confirm that you have achieved them. If you feel that you are not sure about any of the objectives, review the study materials or consult your tutor.
10. When you are confident that you have achieved a unit's objectives, you can start on the next unit. Proceed unit by unit through the course and try to pace your study so that you keep yourself on schedule.
11. When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule.
When the Assignment is returned, pay particular attention to your tutor's comments, both on the tutor—marked assignment form and also the written comments on the ordinary assignments.
12. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed in the Course Guide).

TUTORS AND TUTORIALS

The dates, time and locations of these tutorials will be made available to you, together with the name, telephone number and the address of your tutor. Each assignment will be marked by your tutor. Pay close attention to the comments your tutor might make on your assignments as these will help in your progress. Make sure that assignments reach your tutor on or before the due date.

Your tutorials are important, therefore, try not to skip any. It is an opportunity to meet your tutor and your fellow students. It is also an opportunity to get the help of your tutor and discuss any difficulties you might have encountered during the course of your reading.

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First Publication: 2015

BED 313 OFFICE INFORMATION TECHNOLOGY (2 CREDIT UNITS)
The course includes various office services and automation, information and communication handling procedures, office functions, types of office machines (Manual and electronic gadgets) as they apply to different departments in the office. The future and trends of office information technology

MODULE 1 SYSTEM ADMINISTRATION

UNIT 1 Present day office arrangement
UNIY 2 Office environment
UNIT 3 Types of office machine (Manual and electronic gadget)
UNIT 4 Information technology and information processing task

UNIT 1 PRESENT DAY OFFICE ARRANGEMENT

CONTENT

1.0 INTRODUCTION

Training as businessman, marketer, and accountant's or in a managerial capacity in an organization, any of this might require a space where you will carry out or conduct your day to day work. This space could be refers to as an office. In this unit we are going to look briefly at the basic meaning and function of an office, types of an office as well as other activities relevant to office work.

2.0 OBJECTIVE

At the end of this unit Students' should be able to:

- Define an office
- State the function of an office
- Enumerate types of an office work environment

3.0MAINCONTENT

3.1 Definition and Functions of an Office

An office is a room, space, where administrative works from document preparation, information dissemination, secretarial duties etc. are done. In essence, an office is a

place in an organization where business, clerical and professional activities take place. An office has that ability to self-portray the kind of duties that take place in it.

Function of an Office

- ✓ **Office serve as information Centre –** Office act as information Centre of the enterprises because it is the centre to which coverage information from within the organization and collect information from outside the organization. Such information whether past or presents are preserved in the office
- ✓ **Office as a channel of communication-** office provides service of communication and it is the channel through which written communication move from top to bottom and visa vis.
- ✓ **Office as a co-ordination centre** – Office aids in co- ordination and the process of co-ordination will be impossible without an office. Office provides necessary information to various departments and as such it furnishes a well -placed machinery for co-ordination.
- ✓ **Office acts as a channel with customers -**Office is regarded as the channel, which links business organization with the customers. The enquiries, orders and complaints from the customers are taken care by the office through direct personal contact. Sometimes newspaper is used as a media to inform the **customers.**
- ✓ **Office acts as a link between the shareholders and the company-**Office provides a good linkage with the shareholders by providing share certificate, share transfer, issue of dividend warrants, issue of notice on company's meeting and answering the enquiries made by the shareholders. It also acts as a servicing department for the creditors.

3.2 Types of office

The office type has a significant influence on employee's performance and motivation. Presently there isn't any rule that must be followed as to how an office should look like. It's only important that planners and users work together to analyze and determine needs and requirements of their desired work space. If it has to be a big or small office, it would depend on what obtains in there, the nature of the business that office environment would look like

SELF ASSESSMENT EXERCISE

(a) Define an Office

(b) State five function of an office

Answer to the Self -Assessment Exercise

(a) An office is a place in an organization where business, clerical and professional activities take place

(b) Function of an office includes:

- ✓ Office as a co-ordination centre
- ✓ Office as a channel of communication
- ✓ Office acts as a link between the shareholders and the company
- ✓ Office acts as a channel with customers
- ✓ Office serve as information centre

4.0 CONCLUSION

The conclusion drawn about this unit: that determining the types of office whether big or small office. It would depend on what obtains in there, the nature of the business of that office. An office has that ability to self-portray the kind of duties that take place in it

5.0 SUMMARY

In this unit, key functions of an office were look at. An office is a room, space, where administrative works from document preparation, information dissemination, secretarial are done. Functions of an office were also elucidated. This function includes; Office serve as information centre, Office as a channel of communication, Office as a co-ordination centre, Office acts as a channel with customers, Office acts as a link between the shareholders and the company

6.0 TUTOR MARKED ASSIGMENT

Enumerate and explain five function of an office.

7.0 REFERENCES/FURTHER READING

O'Reilly, Charles A., III, and Michael L. Tushman. "The Ambidextrous Organization." *Harvard Business Review* 82, no. 4 (2004): 74–82.

"Organizational Structure Types and Design Strategy ." *Organizational Structure.net*. Available from: http://www.organizationalstructure.net/.

UNIT 2 OFFICE ENVIRONMENT

CONTENT

1.0 INTRODUCTION

Work spaces are areas that afford you the chance to carry out the specified office function from day to day. There are offices that are typically used for predictable office activities like reading, writing and computer work. There are types of work space that supports different official activities. Therefore, Office layout refers to the way the office is arranged to facilitate the flow of work. There are two types of office work environment / layout. These are (a) closed/personal office and (b) open office work space

2.0 OBJECTIVES

At the end of this unit, students should be able to:

- Differentiate between personal work space and open work space
- State the merits and demerits of Open work space
- Identify factor to consider in planning office work space

3.0 MAIN CONTENT

3.1 Closed office/Personal Work space

- Personal Workspace

A closed/Personal office is an office where each individual is given his/her separate office, it also allows you to manage your private and work life in the same place. As the name implies, it's your private, default work area. The beauty of this is that it is just you having access to your notes, tasks, and tags stored, where your notes and tasks are only visible to you. Below is a pictorial view of what a personal works space should look like

Fig 1.2a, diagram of a personal work space

3.2 **Open office/work space:**

An open plan office is one in which more than one person share the same room. An open work space is for more than ten people at a time. It's suitable for activities which demand frequent communication, more like routine activities which need rather little concentration. Below is a pictorial view of what an Open office work space should look like. It can be team work space or a cubicle work space.

Fig1.2b:Diagram of an Open office work space

✓ Team work space:

A semi-enclosed work space is an office space for two to eight people (employees). It is suitable for teamwork with demands for frequent internal communication and a medium level of concentration.

✓ Cubicle work space:

A semi-enclosed work space for one person (employee).It is very suitable for activities that require medium concentration and a reasonably low level of interaction. This is employed by really small offices that hope to manage work space and still get the best out of it. Below is a pictorial view of what a Cubicle work space actually looks like.

Fig1.2c: Diagram of a Cubicle work space of a business office environment
Shared office work space:

It is an enclosed work space, designed for the comfort of at least two or three office staff. It is appropriate for semi-concentrated and collaborative work for very small groups. Below is a pictorial view of what a shared office work space actually looks like.

Fig1.2d: Diagram of an ideal shared work space

3.3 Comparison of Closed/ personal work space and Open work space

Types of work Environment	Merits	Demerits
Closed/Personal	i. It gives room for privacy, in case of confidential discussions. ii. The occupant of the office can concentrate because there is very little disturbance from other employees.	i. It is not economical. Large space may be occupied by one individual. ii. Separate facilities e.g. computers, telephones etc. may have to be provided for each office. iii. It may be difficult to supervise staff.

		iv. It might slow down the flow of some activities which require constant interaction among employees.
Open office/work space	i. It easy to supervise since everybody is in view. ii. It economizes space. iii. Exchange of information among staff is easy and this facilitates the flow of work. iv. Certain facilities may be used commonly e.g. printers v. Lower energy costs. vi. Few communication barriers. vii. Could easily be rearranged.	i. Some senior staff do not like the idea of been "dumped" in the same room with their subordinates. ii. There is no room for privacy, for people who wish to discuss confidential matters. iii. Noise from movements in and out of the office and office machines might disturb some staff.

3.4 Planning an Office environment

The following factors are taken into consideration in planning the environment of an office

- ✓ Business needs: Office environment should provide an environment suitable for the business of the organization. For example, the layout of a bank will be different from that of an accounting firm
- ✓ Space Availability: Planning an office environment will also depend on quality and the types of office space available for use.
- ✓ Accommodation Standards: Organizations often have a policy on the minimum standard of accommodation for each staff grade. Administration staff may work in open plan offices whereas managers may have individual offices sized on seniority basis.
- ✓ Statutory Requirement: Legal requirements as contained in relevant legislations also affect the planning of office work space.

SELF ASSESSMENT EXERCISE

1. Briefly explain personal work space
2. Enumerate four merit of open work space
3. Identify three factors to consider in planning work space environment.

Answer to Self -Assessment Exercise

1. Personal work space is an office where each individual is given his/her separate office
2. Merits of open work space includes:
   I. Certain facilities may be used commonly e.g. printers
   ii. Lower energy costs.
   iii. Few communication barriers.
   iv. Could easily be rearranged.
3. The following factor should be taken in planning work space environment:

- ✓ Statutory Requirement: Legal requirements as contained in relevant legislations also affect the planning of office work space.
- ✓ Space Availability: Planning an office environment will also depend on quality and the types of office space available for use.
- ✓ Accommodation Standards

4.0 CONCLUSION

The contents of this unit are to help you understand the office environment and the factor to be consider in planning for the work space environment.

5.0 SUMMARY

This unit discussed, an open plan office as one in which more than one person share the same room. An open work space is for more than ten people at a time. We also look at comparison between personal work space and Open work space in terms of their merit and demerits. Finally, factors to be consider in planning work space/office

6.0 TUTOR MARKED ASSIGNMENT

Justify the differences between personal work space and open work space via their merits.

7.0 REFERENCE/FURTHERS READING

- O'Reilly, Charles A., III, and Michael L. Tushman. "The Ambidextrous Organization." *Harvard Business Review* 82, no. 4 (2004): 74–82.
- "Organizational Structure Types and Design Strategy." *Organizational Structure.net*. Available from: http://www.organizationalstructure.net/.

UNIT 3 TYPES OF OFFICE MACHINE (MANNUAL AND ELECTRONICS GADGET)

CONTENT

1.0 INTRODUCTION

Office equipment used varies from one office to the others, this office equipment is actually been use to improved and ease mobility in and around the office environment. The usefulness of this office equipment will be look at in this unit as well as the types of office machine both manual and electronics gadget.

2.0 OBJECTIVES

At the end of this unit, students should be able to:

- State the usefulness of office machine
- Identify types of office machine

3.0 MAIN CONTENT

3.1 **Usefulness of Office Machine**

Office machines are used because of the following reasons:

- ✓ Improves the quality of work.
- ✓ They aid or speed up the performance of routine functions.
- ✓ Improves the quality of work.
- ✓ Use of office machines saves space.
- ✓ They help to simplify the work of employees

3.2 **Types of Office Machine**

The main types of machines you are likely to meet in most offices are:

Manual office equipment, stapler, coffee making machine, typewriters, storage devices (file bookshelf), office phone (CDMA (code division multiple access

I. **Stapler:** For holding documents together
II. **Perforators:** used for punching holes into document to make attachment to file neater.
III. **Cash register:** This is used in the cash office to receive cash and compute cash received from clients/customers. They are also used for computations.
IV. **Paper Shredders:** used in shredding unneeded documents to protect against leakage of content in the process of disposal.
V. **File cabinets:** For storage of folders and protection of documents from fire outbreak, theft etc.
VI. **Office chairs**: which comes either in swivel or stationary form, it is used for sitting in offices. The design is dependent on several factors some of which include seniority, size of space, purpose etc.
VII. **Binding Machine:** used for putting sheets of a document or content of a file together
VIII. **Typewriters**: used for typing documents. Its use is fast becoming obsolete

Electronic office equipment, printers, scanners, fax machine, photocopiers, storage device (flash drive, CD), computers, projectors, office phone (Answering machine)

a. **Photocopiers**: This is a machine used to copy from original documents. The original document may be handwritten, printed or typewritten. Photocopiers are used to prepare extra copies of documents.
b. **Facsimile (Fax) Machine:** This machine scans printed, typewritten texts and images and transmits them through telephone lines to a receiving fax machine that converts the electronic signals back to the original text or image. The machine converts printed material or images into electronic signals. Suitable for transmission through telephone lines, cables or satellite networks, facsimile machines could store messages and transmit them later at a time when transmission costs are cheaper.
c. **Calculating Machine:** This is used mainly in the office for calculations and complex computations
d. **Scanners:** used for scanning images of documents to computers for printing, storage, display or communication via the internet.
e. **Computers:** Perhaps the most common equipment in modern offices, it is used for data and word processing, document storage, communication, presentation etc.

Types of Computers used in any office environment:

Mainframe Computer: These large, powerful and expensive computers could be made used off by more than one user at the same time, within large organizations

- ✓ Personal Computer (PC): Initially produced by IBM in 1981, for executing a single task by a single user at the time. Today, a single person can execute many tasks simultaneously (multitasking).
- ✓ Apple Macintosh (Mac): They are computer made by the Apple company and are usually produced for personal use
- ✓ Laptop computer (notebook): it consists of LCD display and a small keyboard. Although they are relatively small computers, they still perform the same thereby making mobility possible.
- ✓ Personal Digital Assistant - PDA (Palm): These are small computers that can fit into pocket or the user's palm. It was developed for performing basic personal/business functions like:
- ✓ Maintaining the address book,
- ✓ Accessing and browsing the Internet,
- ✓ Sending/receiving e-mails, etc. and

SELF ASSESSMENT EXERCISE

Explain the following electronics equipment

1. Photocopiers
2. Computers
3. Facsimile (Fax) Machine
4. Scanners

Answer to the Self-Assessment Exercise

1. **Photocopiers**: A machine used to copy from original documents. The original document may be handwritten, printed or typewritten. Photocopiers are used to prepare extra copies of documents
2. **Computers:** Common equipment in modern offices, it is used for data and word processing, document storage, communication, presentation etc.
3. **Facsimile (Fax) Machine:** This machine scans printed, typewritten texts and images and transmits them through telephone lines to a receiving fax machine that converts the electronic signals back to the original text or image. The machine converts printed material or images into electronic signals. Suitable for transmission through telephone lines, cables or satellite networks, facsimile machines could store messages and transmit them later at a time when transmission costs are cheaper.
4. **Scanners:** used for scanning images of documents to computers for printing, storage, display or communication via the internet.
5.

5.0 CONCLUSION

Office equipment is actually been use to improved and ease mobility in and around the office environment. Office machines are used because of the following reasons: Improves the quality of work, aid or speed up the performance of routine functions, improves the quality of work, Use of office machines saves space. Help to simplify the work of employees.

1. SUMMARY

Office equipment used varies from one office to the others. In this unit, usefulness of office equipment was examined; also, manual office equipment, electronic office equipment and types of Computers used in any office environment were discussed.

6.0 TUTOR MARKED ASSIGNMENT

State and explain three electronic office equipment used in office environment.

7.0 REFERENCES/FURTHER READING

- O'Reilly, Charles A., III, and Michael L. Tushman. "The Ambidextrous Organization." *Harvard Business Review* 82, no. 4 (2004): 74–82.
- "Organizational Structure Types and Design Strategy." *Organizational Structure.net*. Available from: http://www.organizationalstructure.net/.

UNIT 4: INFORMATION TECHNOLOGY AND INFORMATION PROCESSING TASK

CONTENT

1.0INTRODUCTION

This unit would be broken down in two parts. First, we would look at information technology perspective, benefits of information technology as well as categorists of information processing task and IT tools used, before we would then look at the methodologies and format in which they are been made use of, talking in terms of synchronizing these hardware with their respective software. It's important that we view this unit this way because the Importance of Information technology in any office cannot be over emphasized as can be seen in our present day office.

2.0 OBJECTIVE

At the end of this unit, you should be able to:

- Know and identify how information technology can become a vital and integral part of every official and business plan.
- List any three way in which IT is used.

3.0 MAIN CONTENT

3.1 INFORMATION TECHNOLOGY

The office is that part of an organization or business that handles the information dealing with operation, accounting, payroll, billing, because office labor practically consists of activities such as document preparation, filing, performing simple

computations, checking information, intra-office communication and external communication.

Information Technology (IT) can be said to be any computer- based tool that people use to work with information and support the information and information processing data needs of an organization. It also involves other equipment and information transmission systems and not just computer like facsimiles, telex, e-mail, teleconferencing GSM, telecommuting e.t.c

Information technology (IT) has become a vital and integral part of every official and business plan, from multi-national corporations who maintain mainframe systems and databases to small businesses that own a single computer in a small office, it plays a role.

IT can be used in the following way:

- Information processing tasks e.g. Office Automation
- To support management decision making e.g. use of DTP, Research and training
- To support information sharing through use of network e.g. telecommuting and teleconferencing
- To support innovation e.g. producing automation (i.e. computer Aided Manufacture (CAM), Engineering analysis and design, system Development, e-marketing.

The reasons for the use of computer technology in offices global strategy' is a shortened term that covers three areas: global, multinational and international strategies. Essentially, these three areas refer to those strategies as designed to enable an organization to achieve its objective of international expansion. In developing 'global strategy', it is useful to distinguish between three forms of international expansion that arise from a company's resources, capabilities and current international position.

Fig3.1: A typical office environment having modern equipments

The computer scientist can describe office activities in this form

- A set of activities resulting from requests for service, each with a specific precedence that requires a supporting file system
- A set of people carrying out specific tasks, communicating with and referencing a supporting file system
- A gigantic database with users accessing and manipulating data

The virtual office has no boundary that's why on the application of Information technology.it actually modernizes the office environment, making communication and other office duties easy and possible, creating a need for business minded individuals who can use the latest technologies to connect, support, and coordinate workers in remote locations in and around the office environment not leaving out the growing use of mobile computing, electronic correspondence, the Internet and virtual/wireless technology because with more business are trading in traditional

offices for "virtual offices". Ideally an online Office Management program should be designed for you (students)at under graduate levels to:

- Be able to develop the technical, interpersonal, administrative and communications skills through modern administrative assistant training.
- To get familiar with the Present day hardware devices and technologies include smart phones and tablets and software, mobile computing; cloud computing and document sharing.


Fig3.1a,A traditional office environment Fig3.1b, A typical office environment improved by Technology

Most software and information technology companies seek to employ those having strong programming skills, system analysis, software testing skills, debugging (error detection) skills.

It is almost easier to acquirer practical skills required to become a software developer from the university. This degree encompasses the complete process of software development from software design and development to final testing, in this stage, the individuals logical and critical reasoning/thinking abilities are important to at becoming a software professional.

Computers, are actually been improved upon so that it could ease mobility in and around the office environment, giving rise to the introduction of Laptops. The use of these laptops, often with a printer, scanners, fax machines and other office equipment makes possibly for a better result.

3.2 **Benefits of information technology**

Some benefits that can arise from the crafting information technology in an office environment includes

1. The ease in disseminating information's
2. Communication between individuals in the office becomes faster through any secured line available or been used in that office

3. Protection and proper documentation is also made possible as the system ensures that data is structured and standardized,
4. Using infrared printing and wireless networking cards will enables staff to print their work fast and connect to each other's network especially with the use of e-mail, electronic communication, and, possibly, Internet access even without cables.

3.3 **Information Processing Tasks and the tools used**

1. Capturing Information: that is obtaining information at its point of origin. The tools used consist of input technologies such as mouse, keyboard, e.t.c.
2. Conveying information: that is presenting information in its useful form. The tools used consist of output technologies such as the screen, printer etc.
3. Converting Information: that is processing data to create information. The tools used here consist of processor and internal memory
4. Storage of information: that is storing information for used at a later time. The tools used consist of storage technologies such as hard disk, CD-ROM and DVD.
5. Communication of information: that is sending information to other people or other location. The tools used consist of telecommunications technologies such as modem, satellite and digital computer.

3.4 METHODOLOGIES AND FORMAT IN WHICH THEY CAN BE EMPLOYED

Today, it is widely recognized that the knowledge of information systems is not only essential for organizational heads because most offices need information systems to survive and prosper. It's often said that the better an Information systems there is in any organization, the wider the coverage even at locations on long distances. Information systems provide problem-solving power that most organizations need to effectively run an organization at local and global scale communication amongst people in the same organization and maybe of the same immediate department and communicating with distributors and suppliers in the business world, with some operating 24 hours services with respect to the office environment at different national environments, conducting trade, managing businesses, coordinating global work teams, and servicing local and international reporting needs which has been a major challenge to most organizations that requires commanding information system responses.

1. Again, those with a good amount of information technology skills are able to carry out the processing and storing of information within and around the office which is one major ways information technology has improved our office environment.
2. Next, the communication between staff with the use of mobile phones and other electronic devices Information technology as a field emphasizes the secure

management of large amounts of variable information and its accessibility via a wide variety of systems both local and world-wide. Information Technology allows people to make informed decisions in work places.

3. Information Technology introduces style and dynamism in any office environment its being employed.
4. It also provides businesses with that desired edge over their competitors, creating a whole new opportunity and provides you with the required skills needed for rapid expansion in information technology industry. Major stake holders in the areas of information technology includes:

a. Project manager

He/ She would be the bridging gap between the production team and client. So he/she must have a fair knowledge of the industry they are in so that they are capable of understanding and discussing the problems with either party

b. **Network engineer**

A network engineer is more of a developer, He/ she is concerned with everything that has to do with the network of computers, developing telecommunication network topologies, internetworking service requirements for switched telephone networks and also the required hardware and software.

c. Software architect

A Software architect is a computer expert who makes advanced design choices and dictates technical standards, including software coding standards, tools, and platforms Main responsibilities include Limiting choices available during development just by either choosing, creating or defining standard ways pursuing applications development and framework in any organization.

d. Systems analyst

A systems analyst acts as liaison between the client and the developers. They make use of computers and other related systems to design new IT solutions, modifying and enhancing them or adapt existing systems and integrate new features or improvements, all with the aim of improving business efficiency and productivity.

e. Systems administrator

Sometimes called the '***sysadmin***'He/ She is responsible for maintaining a more than one user (multi-user) computer system including a Local- area network (LAN) whose typical duties included

i. Providing really large storage spaces
ii. Performing processes to prevent the spread of viruses
iii. Setting up user accounts
iv. Adding and configurations of new workstations etc.

f. Programmer

A computer **programmer** is also known as a **developer**, **coder, software engineer** is one who specializes in writing codes for many kinds of software or one who

practices or professes a formal approach to programming, They make use of primary programming computer languages like C, C++, C#, python, java etc

g. IT support technician

It actually is a perfect job for those with sufficient interest in computer related problems or you do have interest for computers. IT support technicians help to find and correct software and hardware problems for computer users in and around the giving office environment.

4.0 CONCLUSION

Reading through the content of this unit, the emphasizes has been placed on the importance of identifying a good working space as can be seen from simple definitions, equipments with which to make working a bit less stressful than it used to be, the importance of unit and management towards attaining desired official goals and ensuring sanity with the use of information technology

5.0 SUMMARY

This unit explains information technology (IT) to be any computer- based tool that people use to work with information and support the information and information processing data needs of an organization. It also involves other equipment and information transmission systems and not just computer like facsimiles, telex, e-mail, teleconferencing GSM, telecommuting e.t.c. Also, discussed are: Benefits of information technology, Categorists Of Information Processing Task and IT tools used, and the Methodologies and Format in which IT can be employed

6.0 TUTOR-MARKED ASSIGNMENT/ ANSWERS

1. What kind of a work space would you characterize a conference room into, give reasons for your answer.

   Answer

   A conference room can be characterized as an open work space reasons been that

- An open work space is for more than ten people having to perform routine duties that need very little concentration.
- It’s usually well spaced and it is suitable for activities which demand frequent communication

2. Which of these work space patterns would you achieve better results assuming you were been employed

   Answer

   One cannot really say a particular work space would be better or preferred because it depends on factors like:

i. The kind of job that is been done an example is production, manufacturing, or pay roll office etc.

ii. Next, it would depend on first the vision of the planner and how he/ she would want it to look like, secondly on the employee, the kind of work space that he/ she would assume the employee can function better in and produce results. Meaning all the work space are important at some point.

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MODULE 2: INFORMATION AND COMMUNICATION HANDLING PROCEDURE

UNIT 1: Management Information System

UNIT 2: Office Automation

UNIT 3: Computer Security

UNIT 4: Information Systems Disaster Discovery Alternative

UNIT I: MANAGEMENT INFORMATION SYSTEM

CONTENT

1.0 INTRODUCTION

An organized approach to the study of the information needs of an organization management at every level in making operational, tactical, and strategic decisions. Its objectives is to design and implement procedures, processes and routing that provide suitably detailed reports in an accurate consistent, and timely manner.

2.0 OBJECTIVES

At the end of this unit, student should be able to:

- Define management information system
- State the nature of data, information and communication
- State function perform by information

3.0 MAIN CONTENT

3.1 Knowledge requirement of MIS

Management information system can be defines as a system to convert data from internal sources into information and to communicate that information, in an appropriate form, to managers at all levels in all functions to enable them to make an activities for which they are responsible.

There are wide ranging knowledge requirements for MIS which includes, the nature of data and information, general system concepts, Organization principles, planning and decision walling control principles, management functions and the use of information technology.

3.2 The nature of data, information and communication

Data is the term for collections of facts and figures e.g. hours worked, invoice values, usage rates, items received etc. these basic facts are store, analyzed, compared, calculated and generally worked on to produce messages in the form required by the user. i.e. The Manager, which is then termed information. In essence information is processed data which is understood by the user

3.3 Function of information:

The function performed by information includes:

i. Improving/ increasing knowledge.
ii. Reduction of uncertainty.
iii. An aid to maintaining and control.
iv. A means of communication.
v. A memory supplement.
vi. An aid to simplification.

3.4 The Value of Information

Information has no value in itself, its value derives from the value of the change in decision behaviour caused by the information being available minus the cost of providing the information, date capture, handling, recording and processing by whatever means incur loss and do not produce values. It is only when data are communicated and understood by the receipt and are thus transformed into information, that value may arise provided that the information is used to improve decision making.

3.5 Characteristics of good communication

Good information is that which is used and which created value. The qualities are as follows:- Good information is:

- ❖ Relevant for its purpose.
- ❖ Sufficiently accurate for its purpose
- ❖ Complete enough for the problem.
- ❖ From a source in which the user has confidence.
- ❖ Communicated to the right person.
- ❖ Communicated in the time for its purpose.
- ❖ That which contains the right level of details.
- ❖ Communicated by an appropriate channel of communication
- ❖ That which is understandable by the user.

SELF ASSESSMENT EXERCISE

1. Define Management Information System.
2. Enumerate five functions performed by information

Answer to the self assessment exercise

1. MIS can be defined as a system to convert data from internal sources into information and to communicate that information, in an appropriate form, to managers at all levels in all functions to enable them to make an effective decision for planning and controlling the activities for which they are responsible.
2. The function performed by information includes.

i. Reduction of uncertainty
ii. An aid to maintaining and control
iii. A means of communication
iv. Improving/increasing knowledge
v. A memory supplement

4.0 CONCLUSION

Management Information System must be designed and operated with due regard to organization and behavioural principles as well as technical factors. Management must be informed enough to make an effective contribution to system design and information specialists such as system analysts, operation researches and others must become aware of managerial functions and needs so that, jointly, more effective MIS are develop.

5.0 SUMMARY

In this unit, the definition Management Information System and the knowledge requirement of MIS have been examined also discussed are the nature of data, information and communications, the functions performed by information, the value of information as well as characteristics of good information.

6.0 TUTOR-MARKED ASSIGNMENT

Enumerate 3 problem associated with Management Information System

7.0 REFERENCES/FURTHER READING

Charles Parker. "Management Information System: Strategy and Action", McGrawhill publishing.

UNIT 2: OFFICE AUTOMATION

CONTENT

1.0 INTRODUCTION

The use of information technology and modern communication system may itself be a factor in the way organizations are structure. By automation we mean using computer technology to speed up the performance of existing task. The computer does not change the task structure, it simply make it more difficult.

2.0 OBJECTIVES

At the end of this unit, students should be able to:

1. Explain Automation
2. Identify quality of person responsible for managing office automation.

3. Enumerate services offered by Computer Bureau x.

3.0 MAIN CONTENT

3.1 Office Automation Project

1. Meaning of office automation
2. Application of area of office automation
3. Adverse effect of office automation on worker

Traditionally, the responsibility for introducing new computer projects was that of the DP manager. However, computerization and other office automation projects can cover a large number of varied office tasks and affect most, if not all, office staff. Although the DP manager has the technical Know-how, he doesn't necessarily have the management skills and knowledge to understand how automation affects:

a. Working arrangements in the office
b. The style or structure of the organization
c. Attitudes of personnel

The person responsible for supervising/managing office automation projects ought ideally to be someone who:

a. Is aware of the different requirements of different users of the same system (especially in network systems or multi-users systems);
b. Is aware of the need to design new systems which fit in with different and changing objectives;
c. Understands how organizations, and people within them, function effectively;
d. Sees office automation as a means of making changes and improvements, not as an end in itself;
e. Has a technical awareness, though an 'expert' technical knowledge is unnecessary.

The office automation manager should be given specified responsibilities, which might include the following.

a. Developing recommending and coordinating plans for office automation projects
b. Working with the accounting department to produce cost/benefit justification for each new project.
c. Producing (and enforcing) guidelines, policies and standards for:
   i. The procurement of hardware
   ii. The procurement of software
   iii. Personnel and pay matters
   iv. Installation and testing
   v. Maintenance of systems

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a. Dealing with hardware and software suppliers
b. Staff education and training in new systems
c. Monitoring new technological development and trends
d. Advising others managers and computer users in the organization
e. Involvement in system analysis, design and installation.

3.1 Meaning of Office Automation:

An Office Automation System is a conglomerate of various technologies intended to improve the efficiency of office work by replacing the routine clerical secretarial and paper-based tasks with computer based equipment.

Application area of office automation system

Some of the application areas of office automation system are:

- **Word Processing:** This involves hardware and software tools that allow the computer to behave like typewriting device.
- **Desktop Publishing:** This refers to technologies used to send messages or documents from one electronic work station to another. Its uses in business include facsimile, voice mail and electronic-mail box.
- **Electronic Mail:** This refers to technologies used to send message or document from one electronic work station to another. Its uses in business include facsimile, voice mail and electronic-mail box.
- **Teleconferencing:** This refers to the holding of meetings among people who are physically different sites. The types of teleconferencing are Video and Audio-teleconferencing.
- **Desktops Organizers:** These are software packages that provide users with electronics equivalent of organizing and coordinating tools likely to be found on an office desk. Tools such as calendar, card file, notepad, clock and calculator are examples.
- **Archival Storage:** This refers to offline storage used for historical and longtime storage of materials. Some common technologies used to store archival materials are magnetic tape and COM.

Adverse effect of office automation on office workers

1. Possible harmful effects and dangers of display devices to user's eyes.
2. Possible reduction in number of office workers

3.2 End-user computer

Traditional, the only people who had direct with computer were the systems professionals (programmers, systems analysis etc).

The introduction of personal Computer, terminals, networks, user-software, databases etc has altered the position dramatically and has led to the growth of end-user Computers by users-not indirect use through systems professional. Users include; Managers, office staff, sales people, production workers and others.

End-user Computing is a large and growing field and some of the applications are listed below:

- ❖ Decision support systems
- ❖ Expert systems
- ❖ Executive Information systems
- ❖ End-user programming
- ❖ Computer based training
- ❖ Search and retrieval of information
- ❖ Text handling and publishing etc

NOTE: An Expert system is a Computer system which embodies some of the experience and specialized knowledge of an expert(s). An Expert system enables a non-expert to achieve comparable performance to an expert in the field. It uses a reasoning process which bears some resemblance to human thought.

The unique feature of an Expert system is the knowledge base, which is a network of rules which represents the human expertise. These rules and linkages are derived from discussions with experts and analysis of that decision making behavior.

Expert systems have been developed in a number of fields of which the following are example: medical diagnosis selection of selling methods personal tax planning credit approval in banking product pricing, air crew scheduling e.t.c.

3.3 Information Centre (IC)

An IC is small unit of staff with a good technical awareness of Computer systems, whose task Excel professional Centre, Ibadan is to provide a support function to computer users within the Organization. They also provide help to users

who wish to develop their own programs and act as a go between or link between Computer users and the Organization's own DP department or external software and hardware suppliers. IC are particular value where distributed data processing is used or where micro Computer are spread throughout the Organization. In such circumstances many non-Computer-technical people are in charge of files, software and hardware and thus need technical support and advice from time to time.

Typical of the services IC provide are the following:

- ❖ To identify areas where it could usefully be employed
- ❖ To provide technical advice on existing and new hardware: capabilities, limitations speeds etc.
- ❖ To show users how to deal with all types of software: application packages, O/S etc.
- ❖ To encourage good practice throughout the Organization, e.g. system/ program documentation, back-up procedures, quality checks
- ❖ To help avoid over-laps, duplicating of effort
- ❖ To provide general IT training and specialist training on new developments, equipment software.
- ❖ To provide assistance and guidance to users developing their own systems.

3.4 Other DP Resources

Many Organizations do not employ specialist DP staff because they cannot justify the costs of full time systems analysts and programmers. If an Organization does not wish (or cannot afford) to have its own in house Computer, or requires technical information, or need experts advice on systems development without employing its own Computer experienced staff, it might employ an office automation manager or set up an information centre. Alternatively, or additionally it may prefer to use external DP resources. This might involve buying application packages from a supplier, but also a range of others resources and services.

3.5 Computer Bureaux

These are Organizations, which provide DP facilities to their clients.

The range of resources offered by Computer bureaux is considerable, with some offering a complete service while others specialize in particular areas. The services offered include:

a. **Data Preparation:** Transcribing data from sources documents into a machine readable from (e.g on to magnet tape. Disks etc), including the services offered for File conversion on system implementation Excel Professional Centre, Ibadan
b. **Hiring Computer Time:** bureau will process the client's data on its own Computer.
c. **Do it yourself**: a bureau will provide the computer but the client will provide operators, programs etc.
d. **Consultancy:** a bureau may provide advice and assistance in connection with feasibility studies, system design, equipment evaluation etc.
e. **Software:** a bureau may design, write, test and provide software for a particular application; or may design and/ or adapt application packages;
f. **Timesharing/Remote Job Entry (RJE):** The client uses his own remote terminals, to process data on the bureau Computer.
g. **Turn Key Operation:** where the bureau undertakes the client's conversion to a computer system, and all the client has to do is 'turn the key' to commence using the systems;
h. A system integration service to provide an interface between an Organization and another.

SELF ASSESSMENT EXERCISE

1. Briefly explain the meaning of Automation
2. State three (3) roles of person responsible for managing office automation.
3. Identify four services rendered by computer Bureaux.

Answer to self assessment exercise

1. Automation means using the computer technology to speed up the performance of existing tasks. The computer does not change the task structure; it simply makes it more efficient.
2. The person responsible for supervising office automation projects ought ideally to be someone who:
   - Is aware of the different requirements of different users of the same system (especially in network systems or multi-user system)
   - Sees office automation as a means of making changes and improvements, not as an end in itself.
   - Is aware of the need to design new systems which fit in with different and changing objectives.

3. **The services offered include:**
   - **Data preparation:** Transcribing data from source documents into a machine readable from (e.g on to magnet tape, disk etc) including the services offered for file conversion on system implementation.
   - **Hiring Computer time:** a bureau will process the client's data on its own computer.
   - Do it yourself, a bureau will provide the computer but the client will provide operators, programs etc.

4.0 CONCLUSION

Computerization and other office automation projects can cover a large number of varied office tasks and affect most, if not all office staff. End-user Computing is a large and growing field with some of the application like decision support system,

expert system, executive information system etc while An IC is a small unit of staff with a good technical awareness of computer users within the organization and computer bureaux the organizations which provide DP facilities to their clients.

5.0 SUMMARY

This unit examined the definition of automation and office automation projects: in the introduction, automation is defined as a means of using computer technology to speed up the performance of existing task. It is also noted that data processing manager has the technical know-how, he doesn't necessarily have the management skills and knowledge to understand how automation affects, working arrangement in the office, the style or structure of the organization, attitude of personal. Also, the end user computer, Information centre and other resources were also noted. Finally computer Bureaux, these are organization which provides DP facilities to their client also examined.

6.0 TUTOR MARKED ASSIGNMENT

a. What is office automation?
b. Enumerate and discussed five application of office automation system
c. List two adverse effects of office automation

7.0 REFERENCES/FURTHER READING

Stephen N, Maeve, C & Donald J. "Management information system for the information age "Mc Grawhill Yadav D.S, "Foundations of Information Technology; New Age International Publisher's

UNIT 3: COMPUTER SECURITY

CONTENT

1.0 INTRODUCTION

Failure to secure information may consequently result in irrecoverable losses and harm the credibility of an organization. ICT system and data processed by such system may be made dysfunctional due to number of various factor such as natural factors, technical failures, human errors and faults, malicious software, international attacks, Computer Crime and International terrorism.

2.0 OBJECTIVES

At the end of this unit, students should be able to:

i. Explain Computer Security
ii. Identify measure to put in place in computer security.

3.0 MAIN CONTENT

3.1 Computer Security

Security can be defined as the protection of systems from accidental or deliberate threats that might cause unauthorized modification, disclosure or destruction as well as the protection of information systems from degradation or non

availability of services. This is concerned with protecting computer systems, computer files and databases from external sources of damage.

A breach of security may result into any of the followings.

i. Loss of Confidentiality
ii. Loss of availability of computer services through unscheduled interruption and breakdown.

Security measures must be proactive and reactive, sound in principle and effective in operation. Security must be considered from two perspectives, namely; operation and physical.

Operations Security has two purposes namely:

i. Prevention of unauthorized users to access or use data and
ii. To prevent authorized users from misusing the data or damaging it through ignorance

3.2 COMPUTER SECURITY MEASURE

Computer Security can be measures in the following ways

i. Preventive
ii. Proactive
iii. Detective
iv. Deterrence
v. Recovery
vi. Correction
vii. Physical Security

Prevention and Proactive measures include the following:

❖ Precautionary measures to safeguard the system from external threats and unauthorized persons e.g. password.

- Measures and obstruct protect and defend the system from illegal operations by authorized personnel e.g. the use of operator permissions, restrictions of access to certain functions.
- Internal resistance measures to immune the system from damage and neutralizes the effect of operations inimical to the correct performance of the system

Procedures for threat avoidance either by making alterations or by changing the design of the system

i. Measures to sense and report unauthorized operations.
ii. Measures to discover and identify illegal operations and intruders.

- **Deterrence:** Deterrence measures ensure that illegal operations are not encouraged and that erring employees are not allowed to become bad influences to others. Deterrence measures must include appropriate incentives and penalties to restrain same persons or other users to perform such acts in future.
- **Recovery:** Recovery procedures must be in place to minimize the effects of unscheduled interruptions/breakdowns and provide a means to ensure continuous operations and prevent financial losses to the business.
- **Correction:** Remedial actions must be taken to bring the system back on track after recovery. This may include procedures to make necessary amendments and fine tune the system to achieve desired performance levels.
- **Physical Security:** This relates to the ability to protect the hardware and media that hold programs and data from destruction, loss or damage.

This means of achieving physical security depends on the control environment and the nature of the threat. The measures discussed under operation security are also applicable to physical security.

Physical Security measures may include the following:

- Physical access controls
- Fire prevention and detection equipment

- ❖ Storage of Uninterrupted power supply (UPS)
- ❖ Introduction and enforcement a strict backup routine with a copy of the data stored in a secure location offsite.

Password Security: The first thing to think about when you implement an office security policy is passwords. It seems to be so obvious, and yet it is often overlooked. If someone has workstation, here are some common-sense guidelines for keeping your password secure:

Dos

- ❖ Change your password often (monthly is recommended)
- ❖ Use letter/number/special character combination
- ❖ Choose a password that is easy to type
- ❖ Choose a password that is easy to remember
- ❖ Make your password at least six characters long.

Don't

- ❖ Don't use your first or last name.
- ❖ Don't use the name of your pet or partner
- ❖ Don't use your login or username
- ❖ Don't leave a password on some one's voice-mail
- ❖ Don't use the same password for all your password needs.

SELF ASSESSMENT EXERCISE

1. What do you mean by computer security?
2. Enumerate five computer security measures that can put in place

Answer to the Self Assessment Exercise

i. Computer Security is concerned with protecting computer systems, computer files and databases from external source of damage. By security we mean the protection

of systems from accidental or deliberate threats that might cause unauthorized modification.

ii. Computer Security can be measures in the following ways.

- Preventive
- Proactive
- Detective
- Deterrence
- Physical Security

4.0 CONCLUSION

Security measures must be proactive and reactive, sound in principle and effective in operation when implement an office security policy and information handling.

5.0 SUMMARY

Computer security is concerned with protecting computer systems, computer files and databases from external sources of damage. In this unit, we have examined the computer security measures to put in place such as preventive, proactive, detective, deterrence, recovery, correction and, finally, physical security.

6.0 TUTOR MARKED ASSIGNMENT

Computer Security policy distinguish between security and physical security.

7.0 REFERENCE/FURTHER READING

James A. Anderson (1980) “Computer Security Threats and Surveillance”

Yadav D.S “Foundations of Information Technology” New age International Publishers

UNIT 4: INFORMATION RECOVERY PLAN

CONTENT

1.0 INTRODUCTION

A good business continuity plan will take into account all types of events affecting both critical information system facilities and end user's normal business operation functions. In addition to these, in case of worst scenario, short term and long term fallback provisions and required. For the short term, an alternate processing facility may be needed to meet immediate operation needs, as in the case of a major natural disaster, in the long term, a new permanent facility must be identified for disaster recovery and equipment to provide for continuation of information system processing services on a regular basis.

2.0 OBJECTIVES

After studying this unit, the students should be able to:

- Explain information system contingency and disaster recovery plan.

- Identify causes of disaster
- State information systems disaster recovery strategies

3.0 MAIN CONTENT

3.1 Information System Contingency and Disaster Recovery Plan

Information system contingency planning, otherwise called Business Contingency Planning (BCP) is a process designed to reduce the organization's business risk arising from an unexpected disruption of its information systems which is critical to the organization.

BCP is primarily the responsibility of senior management, as they are entrusted with the safeguarding of both the assets and the viability of the organization.

3.2 Disasters and disruptive events to information system

Disaster can be defined as disruptive incidences that cause critical information system resources to be inoperative or nonfunctioning for a period of time and thereby adversely affecting business operating.

3.3 CAUSE OF DISASTER

- Natural calamities, such as floods, severe thunderstorms and fire.
- Electrical power, telecommunications and delivery services that are no longer supplied to the company.
- Event caused by human being, such as attacks from hackers or viruses.

3.4 INFORMATION SYSTEM DISASTER RECOVERY STRATEGIES

Information systems disaster recovery strategy is a combination of preventive, detective and corrected actions to be taken are:

- Removing the threat altogether
- Minimizing the likelihood of occurrence and
- Minimizing the effected of occurrence.

Removing the threat and minimizing the risk of occurrence can be addressed by the implementation of physical and environmental security, while minimizing the effect can be achieved by implementing built in resilience through alternative routing and redundancy.

In selecting a recovery strategy, the following should be considered.

- The criticality of the business process and the applications supporting the process
- Cost
- Time required to recover and
- Security

SELF ASSESSMENT EXERCISE

i. What is disaster recovery plan?
ii. Give any three key element required in a disaster recovery plan

Answer to self assessment exercise

A disaster recovery plan is an arrangement that provides for immediate access to the alternative computer hardware and the restoration of software programs data and telecommunication facilities in case of the unexpected.

Key elements required in disaster recovery plan are:

- An emergency plan
- A backup plan
- A recovery plan
- A test plan

4.0 CONCLUSION

Information systems disaster recovery strategy is a combination of preventive, directive and corrective measures. In case of every costly disruption especially when

there is a serious damage to primary, physical facility, there is need for offsite backup alternative. Such off site backup facilities includes: Hot site, warm site, cold sites and mobile sites.

5.0 SUMMARY

A disaster recovery plan is define in this unit as an arrangement that provides for immediate access to the alternative computer hardware and the restoration of software programs; data and telecommunication facilities in case of the unexpected. Also discussed information system contingency and disaster recovery plan, Disaster and disruptive events to information system, causes of disaster as well as information system disaster recovery strategies

6.0 TUTOR MARKED ASSIGNMENT

- Give any three causes of disaster
- What is a system contingency and disaster recovery plan

7.0 REFERENCES/ FURTHER READING

Daniel Saber, “Privacy Issues in Computer- Mediated Communication.

James P. Anderson (1980) “Computer Security Threats and Surveillance”.

MODULE 3: THE INFORMATION SYSTEMS INFRASTRUCTURE MANAGEMENT.

Unit1: Hardware,
Unit2: Software types and their capabilities
Unit3: IT and e-business enabling software
Unit4: Managing people in the organization.

UNIT1: HARDWARE
CONTENT

1.0 INTRODUCTION

This unit hopes to explain Information technology (IT) is a technology in which computers are made use of to, process, store, protect and transfer information. It is common to use the term Information and the ordinary office by means of a computer system. Computerizations in any office environment abet for staff with duties like document preparation, information management and decision making. Such systems may be as modest as a group of independent word processors, or as complex as a

distributed set of large, communicating computers. Within in this spectrum is a central computer with several interactive terminals, or a set of small interconnected computers. In either system the office worker would need a work station to perform his work, and that work station would be capable of electronically communicating with other work stations. You should be able to identify these equipments that make life and working conditions better around the office before the end of this unit

2.0 OBJECTIVE

You should at the end of this unit be able to,

- Identify hardware used in any office environment from the others
- State means of Upgrade the office to the standard to meet modern office environment
- Identify systems used for gathering information, process, store, or analyze data
- The difference between office information systems (OIS) and data processing systems is that

3.0 MAIN CONTENT

3.1 The Information Systems Infrastructure Management

Any area where people live or work needs a supporting infrastructure, which entails the interconnection of basic facilities and services enabling the area to function properly. A comprehensive example would be that of a city, whose infrastructure includes components like streets, power, telephone, water, and sewage lines but off course banks, schools, markets/ retailing shops, places of worship, and law enforcement. Both the area's inhabitants and the businesses would definitely be depending on that infrastructure.

Cities with a good infrastructure re considered more habitable than cities with poorer infrastructure and are much more likely to attract businesses and residents. The same goes for valuable employees often choose offices with better facilities and management processes.

The Need for an Information Systems Infrastructure

As people and companies rely on basic infrastructures to function, businesses also rely on an information systems infrastructure like the use of hardware, software, networks, data, facilities, human resources, and services, to support their decision making, business processes, and competitive strategy.

Almost all of an organization's business processes depend on the fundamental information systems infrastructure, even though to different degrees. For example, an organization's management needs an infrastructure to support a variety of activities, including reliable communication networks to support collaboration between Departmental heads and staffs, suppliers and customers, accurate and timely data and knowledge to gain business intelligence, and information systems to aid decision making and support office and business processes. The summary is organizations rely

on a complex but organized information systems infrastructure to effectively thrive in this competitive digital world.

There are a variety of different systems used for gathering information, process, store, or analyze data in an effort to better manage the organization. Making it easy for modern organizations to rely on these infrastructures, they include:

- Hardware
- Software
- Communications and collaboration
- Data and knowledge
- Facilities
- Human resources
- Services

We would briefly discuss each of these components and highlight their role in an organization's information systems infrastructure

The difference between office information systems (OIS) and data processing systems is that; A data processing system is used to implement algorithms which ordinarily proceed without the need for human interaction. Typical data processing systems compute payrolls, implement accounting systems, manage inventories, etc.

2.4 HARDWARE,

An office information systems (OIS) is made up of a collection of highly interactive self-sufficient tasks that execute in parallel; the OIS tasks include document preparation, staff payment (payroll), document management, communication, and aids in decision making.

The computer consists of:

- hardware – physical computer parts that are obviously visible
- Software – set of commands that are "understandable" to the computer; instructions to the obvious parts, giving order what to do.

Hardware

The information systems hardware is an integral part of the Information System infrastructure, it consists not only of the computers used in an organization but also of networking hardware. While the computing hardware is essential to an organization's infrastructure because it is needed to majorly stores and process organizational data, the networking hardware is needed to connect the different systems to allow for collaboration and information sharing. Companies often face difficulties in making decisions as regards their hardware. Constant innovations within the information technology sector lead to ever-increasing processor speeds and storage capacities but also to rapid obsolescence. Information systems executives therefore face countless complex questions like:

- Which hardware technologies should be chosen?

This when a company decide which office equipment is of utmost importance to them at the moment. Would it be new computers rather than a Typewriter, coffee maker, office phone (CDMA (code division multiple access) / wireless), a fax machine, a photocopier, a printer, a new shelf etc?

- At what time interval should these equipments be replaced?
  This would mean when should any of these equipment be classified as too old and unfit for a working condition i.e. when are they due for a change, and how soon should it be done most importantly, how easy would it be if you have to make do with the equipment assuming they (equipments) don't meet up with the desired technology it the office
- How can the information systems be secured best?
  This decision is best resolved by management responsible for the office information security technology.
- What performance and storage is needed today? Next year?
  This is also to be resolved by management board in charge of optimization of information technology present in any given office to help realize these goals
- How can reliability be assured?
  When goals are set for those in charge, methods towards making sure the office utilizes its potential which is to make sure information technology is realized.

a) Multimedia player: iPod, iRiver..
   Input and output devices of a computer hardware system
   Input devices:

- keyboard
- scanner
- touchpad
- Mouse Trackball. The most important office equipment with fast improving intentions is the computer.

3.5 Basic principle of computers

As data enters the computer through one or more input devices, the computer then processes the data and transmits the result to the output devices. Output devices can be human inter-faces e.g. a screen or another electronic device like a storage device or computer network.

3.6 Types of Computers used in any office environment:

- Mainframe Computer: These large, powerful and expensive computers could be made used off by more than one user at the same time, within large organizations
- Personal Computer (PC): Initially produced by IBM in 1981, for executing a single task by a single user at the time. Today, a single person can execute many tasks simultaneously (multitasking).

- Apple Macintosh (Mac): They are computer made by the Apple company and are usually produced for personal use
- Laptop computer (notebook): it consists of LCD display and a small keyboard. Although they are relatively small computers, they still perform the same thereby making mobility possible.
- Personal Digital Assistant - PDA (Palm): These are small computers that can fit into pocket or the user's palm. It was developed for performing basic personal/business functions like:
  • Maintaining the address book,
  • Accessing and browsing the Internet,
  • Sending/receiving e-mails, etc. and
  Managing personal or business tasks and assignments
  Note: PDAs have now been replaced by modern smart phones that combine the features of a PDA with a mobile phone and camera
  Beside notebooks and palms, there are other portable digital devices:

b) Mobile phones.
c) Smart phone – mobile phone with advanced functions such as email, Internet browser, eBook reader.

-
- joystick
- microphone
- stylus
- camera (web, digital)
  Output devices
- monitor
- projector
- printer
- plotter
- speakers
- earphones

The most important component of the computer consists of the following components:

1. Motherboard – MBO; this is a computers "backbone" responsible for communication between components and help in the transmission of information.

- Central Processing Unit – CPU:It commands execution, data transmission, computer function control.
  Basic characteristics:

It has speed (in Mega Hertz (MHz), Giga Hertz (GHz)), amount of memory (Cache in Bytes)

2. Random Access Memory – RAM; it's known as memory container for programs that are currently running on the system.
   Basic characteristics:
   Speed (in MHz, GHz), capacity (in Bytes), data rate class (DDR SDRAM, SDR SDRAM)
3. Permanent memory:

- Hard Disk Drive – HDD: It's a memory device, used for permanent data storage. The data is stored on the magnetic platters. The HDD is also made of electromagnetic heads, used for reading and recording data with the exception of the newest disk called Solid Staten Drive (SSD). The made up of two parts Internal and External hard disk.
  Basic characteristics include:
- Disk platters rotation speed (in RPM)capacity (in GB), connection interface (IDE, SATA)
- Floppy Disk Drive – FDD
- optical disks - CD, DVD

4. Graphics processing units (GPU): It's for processing and displaying images on the monitor, and also consists of a graphics processor and its own working RAM memory
   Basic characteristics:
   • RAM size
   • Connection interface/slot type
5. ports:

- Parallel Port
- Serial Port
- Universal Serial Bus (USB)
  There are other common devices for storing and transferring data from one computer to the other like:
- USB flash drive
- diskette and ZIP diskette
- CD and DVD discs.
- Memory cards.
  Communications and Collaboration between office systems
  One of the reasons why information systems in organizations have become so powerful and important is the ability to interconnect, allowing internal and external constituents to communicate and collaborate with each other. The infrastructure supporting this consists of a variety of components, such as the networking hardware

and software that facilitate the interconnection of different computers, enabling collaboration literally around the world. However, having a number of interconnected computers is necessary but not sufficient for enabling communication and collaboration; companies also need various other hardware and software. An example is e-mail servers, along with communication software such as Microsoft Outlook, which are needed to enable a broad range of internal and external communication. Further, it has become increasingly important for companies to be able to utilize videoconferencing to bridge the distances between a company's offices or between a company and its business partners, saving valuable travel time and enhancing collaboration. However, as there are vast differences in terms of quality, costs, and functionality of these systems, companies have to assess their communication needs and carefully decide which combination of technologies best support the goals of the organization.

Data and Knowledge

This is probably among the most important assets an organization has, as data and knowledge are essential for both gaining business intelligence and executing business processes. Managing this resource however require an infrastructure with sufficient capacity, performance, and reliability. For example, companies like Amazon.com needs databases to store customer information, product information, inventory, transactions, and so on.

Management here would mean trained professionals who are relatively well educated and can create, modify, and/or synthesize knowledge and the new economy where organizations must effectively utilize their knowledge to gain a competitive advantage.

Facilities although not directly needed to support business processes or business intelligence, specialized facilities are needed for the information systems infrastructure. Although not every company needs facilities such as those used by Google's data center but managers would need to carefully consider where to house the different hardware to be used, software, data centers, and so on.

A regular office desktop computer might not need much in terms of power, nor does it generate much heat; however, massive clusters of computers or server farms i.e. facilities housing a vast number of servers to support the information processing needs of a large organization, In addition to such technical requirements, there is also the need to protect important equipment from intruders and other elements such as water or fire.

The most prominent threats to an organization's Information system (IS) facilities come from floods; seismic activity, rolling blackouts, hurricanes, and the potential of terrorist activities. Other issues to consider are the questions of availability; for example, can an organization afford to have its Web site unavailable for a minute, for an hour, or even for a day?

Human Resources

Another issue faced by companies is the availability of a trained workforce. Although even large facilities do not require large support staffs except them are well trained. This is one of the issues faced by offices or companies having very large data center. While the construction of the facility has created a large number of construction jobs, helping the area's unemployment situation, permanent jobs will likely require special skills so that much of the workforce will be "imported" from other regions. For this reason, many companies try to locate facilities in common areas.

Designing the Information Systems Infrastructure

Every organization has its growing needs for a comprehensive information systems infrastructure, a number of solutions have emerged and are continuing to emerge. While some of these solutions are already common business practice, others are just now starting to be adopted. We would attempt to create solutions as to effectively designing information systems infrastructure.

Managing the Hardware Infrastructure

As earlier stated, the hardware is an integral part of the Information System infrastructure within and around the office, businesses environment and research facilities which face an ever-increasing need for computing performance. For instance, auto manufacturers, such as the GM German subsidiary Opel or Japanese Toyota, use large supercomputers to simulate automobile crashes as well as evaluate design changes for vibrations and wind noise.

Another example would be the research facilities such like the U.S. Department of Energy's Lawrence Livermore National Laboratory that makes use of use supercomputers for simulating nuclear explosions, while others simulate earthquakes using super computers. Interesting right, such research sites have a tremendously complex hardware infrastructure.

This is expected as not every organization would face such large-scale computing problems, the demands for computing resources are often fluctuating, leading to either having too few hardware (resources)to resolve problems or having too many idle hardware most of the time. To address this problem, many organizations now turn to

i. On-demand computing for unpredictable computation needs.
ii. Grid computing for solving large-scale problems, and
iii. Autonomic computing for increasing reliability.

On-Demand Computing

On-demand computing is a way to address some unpredictable computing needs, making it possible to allocate the available resources on extreme users need basis which would most times be on a pay-per-use basis. For example, more bandwidth will be allocated to a videoconference, while other users who do not need the

bandwidth at that time receive less. Similarly, a user running complex data mining algorithms would actually receive more processing power than a user merely doing some word processing. At times, organizations prefer to "rent" resources from an external provider. This form of on-demand computing is referred to as utility computing, this happens when the resources in terms of processing, data storage, or networking are rented on an as-needed basis and the organization receives a bill for the services used from the provider at the end of each month. For many companies, utility computing is an effective way for managing unforeseen demand, controlling costs in essence, all tasks associated with managing, maintaining, and upgrading the infrastructure are left to the external provider and are typically bundled into the "utility" bill. The point is this, if you don't use, you don't pay.

Grid Computing

Although today's supercomputers have tremendous computing power, some tasks are even beyond the capacity of a supercomputer. Indeed, some complex simulations can take a year or longer to calculate even on a supercomputer. Sometimes, an organization or a research facility would have the need for a supercomputer but may not be able to afford one because of the extremely high cost. One of such example is the fastest supercomputers whose cost is approximately add up to some billions in Naira, and this does not represent the "total cost of ownership," not yet, It also includes all the other related costs for making the system operational. e.g. personnel, facilities, storage, software. Additionally, the organization may not be able to justify the cost because the supercomputer may be needed only occasionally to solve a few complex problems.

Grid computing, actually refers to combining the computing power of a large number of smaller, independent, networked computers often regular desktop PCs into a interconnected system in order to solve problems that only supercomputers were previously capable of solving. As a major characteristic, the grid computers are regarded as very specialized systems because they allow organizations to resolve(smaller or larger) re-occurring problems

To make grid computer work, large computing tasks are broken into small chunks, each of which can then be completed by the individual computers

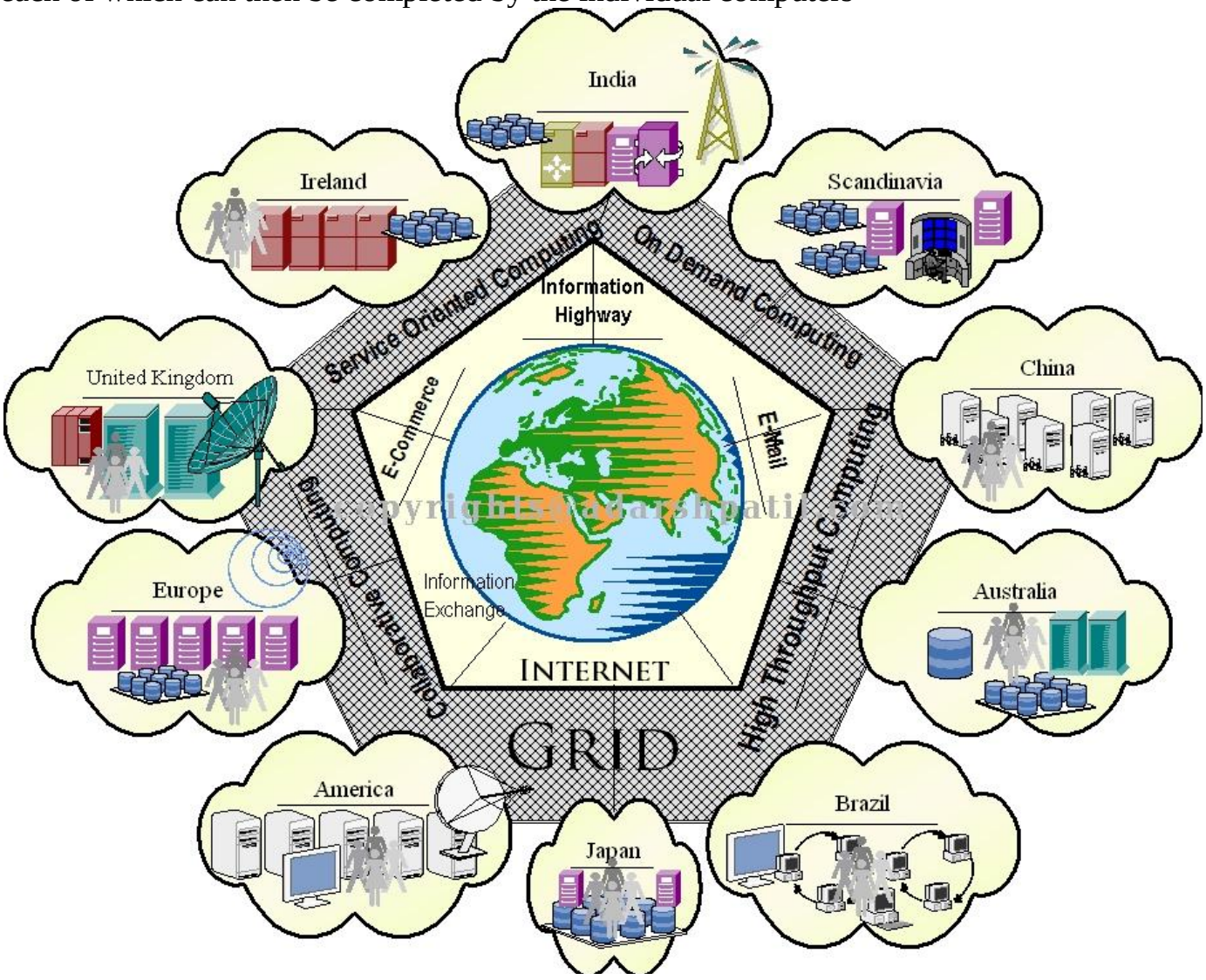

Fig: how a grid computer works, linking and resolving problems all over the world by breaking each task in to smaller bits to be resolved

However, the grid will always poses a number of demands in terms of the underlying network infrastructure or the software managing the distribution of the tasks. Further, many grid computers perform on the speed of the slowest computer, thus slowing down the entire grid. Many companies, big offices actually do start out with a grid computing infrastructure and attempt to overcome these problems by using a dedicated grid. I.e. when the individual computers, or nodes, are just there to perform the required task just like in the grid's computing.

The **advantages of a dedicated grid** would include it being

- Easier to set up and manage,

- It's cost effective when compared to purchasing supercomputer.
- As the grid evolves and new nodes could always be added,
- Dedicated grids become more heterogeneous over time.

One factor that adds to the popularity of using dedicated grids is the falling cost of computing hardware. Just a few years ago, companies have attempted to utilize idle resources as much as possible and set up heterogeneous computing grids. However, the added complexity of managing heterogeneous grids poses a large cost factor so that today it is often more cost effective to set up a homogeneous, dedicated grid; in this case, the savings in terms of software and management by far offset the added costs for dedicated computing hardware in terms of both acquisition and maintenance.

Edge Computing

Another recent trend in IS hardware infrastructure management is edge computing. With the decrease in cost for processing and data storage, computing tasks are now often solved at the edge of a company's network. In other words, rather than having massive, centralized computers and databases, multiple smaller servers are located closer to the individual users. This way, resources in terms of network bandwidth and access time are saved. If a computer needs several hours to compute a certain problem, it might be a good choice to send the task over a network to a more powerful computer that might be able to solve that problem faster. However, as the costs for computing power have decreased tremendously over the past years, many problems can be computed locally within a matter of seconds, it is no longer economic to send such problems over a network to a remote computer. There are hopes of improvements in the future

SELF ASSESSMENT EXERCISE

Identify five most important component of the computer

Answer to the self Assessment Exercise.

1. Central Processing Unit – CPU: commands execution, data transmission, computer function control.
2. Random Access Memory – RAM; it's known as memory container for programs that are currently running on the system.
3. Graphics processing units (GPU): It's for processing and displaying images on the monitor, and also consists of a graphics processor and its own working RAM memory
4. Permanent memory: Hard Disk Drive – HDD: It's a memory device, used for permanent data storage. The data is stored on the magnetic platters.
5. ports: Parallel Port, Serial Port, Universal Serial Bus (USB)

4.0 CONCLUSION

This unit covered mostly hardware being used in office environment, their functions with respect to present day information technology. An office cannot be really complete without the use of information technology, as this equipment usually makes life really easy within the office, knowing that they would really be ordinary without the information technology, care and management for these equipments.

5.0 SUMMARY

The most important components of computer were treated, we also discussed advantages of a dedicated grid.

6.0TUTOR MARKED ASSIGNMENT

What are the merits of dedicated grid?

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UNIT2: SOFTWARE TYPES AND THEIR CAPABILITIES

CONTENT

1.0 INTRODUCTION

In this unit, we would examine different soft ware, from open software to cheap and accessible software that we can use in/ on any every day computer. The unit would also be able to point out features real user friendly software is applicable to which department and /or what unit. It's also very possible for this software to be properly installed with the required hard ware and it becomes possible to send and receive information from within and around the office through mails and most social media.

2.0 OBJECTIVE

At the end of this unit, you should be able to

- Identify the actual software to be used that is compactable with a particular network and for which particular Hardware before its been used
- Should be able to know what particular operating software is good for which particular job, and which type is actually user friendly.
- State how to effectively reduce cost on software usage at any time.

3.0 MAIN CONNTENT

3.1 SOFTWARE

There are various types of software that enables companies to utilize their information systems hardware with the network. This software assists organizations in executing their business processes and competitive strategy. Consequently, with increased reliance on information systems for managing the organization, effectively utilizing software resources has become critical and complex. Companiesthat have to

manage updates **on** software, fixing bugs, and managing issues related to software licenses on every computer used.
Software has been defined as a computer program which, unlike hardware, is an indescribable part of the computer. It's written to perform a single or multiple tasks on computer using the built-in hardware.
Software, an essential component of computer systems, regardless of where the system is been used because, it enables hardware communicate with each other to get the desired work done.

Managing the Software Infrastructure
With growing use of information systems to support office, schools, organizations' business processes and the need for business intelligence, organizations have to rely on a variety of different software. However, continuously upgrading of operating systems and applications software is not cost effective both in terms of labor and the actual products needed for most schools, training centers, offices or even big organization.
To reduce such costs, many companies now turn progressively to the use of open-source software, attempting to integrate various software tools, or using application service providers for their software needs.
3.2 Web Services
To perform business processes and for business intelligence, it is often essential to draw information from different sources or different applications. However, with the increasing complexity of an organization's software needs, it is often impossible to get all of the various applications to integrate seamlessly.
In some cases, software companies (such as Microsoft and IBM) offer a wide range of products, all of which can interoperate quite well. However, business organizations sometimes shy away from being completely dependent on a single vendor for their software needs. One way to increase the independence while still being able to integrate various software applications is the use of Web services. Web services are Web-based software systems used to allow the interaction of different programs and databases over a network.
Using Web services, companies can integrate information from different applications, running on different platforms. For example, you can use Web services offered by Google to integrate search functionality into your own Web site, or you can use Web services offered by MapQuest to provide your guests with an interactive map to your house.
The main goal of implementing a service-oriented architecture is the integration of different applications using Web services. In a service-oriented architecture, different business tasks, or services, are integrated to better perform various business processes. These services are typically vendor independent and can thus be used to

integrate data and capabilities of different systems running on different platforms. This capability and the reusability of different services actually allow businesses to quickly react to changes in the business environment.

3.3 Types of Software

1. Operating systems (OS) is known as that basic program a computer that is automatically loaded when computer is started up. They are programs like:

- Linux (Debian, Ubuntu, Fedora, Knoppix...)
- Microsoft Windows (XP, Vista,...)
- Mac OS X (Cheetah, Panther, Snow Leopard...)

2. Application software – some types of software that can be used on an installed operating system:

- Office programs – Open Office.org, Microsoft Office
- Antivirus program – Avira, Sophos, Kaspersky, Avast, McAfee, Panda, Norton etc. (should Microsoft security essential be regarded as an antivirus, and why)
- Web browser: Mozilla Firefox, Microsoft Internet Explorer, Opera, Safari, Google chrome etc.

3. E -accessibility options

- Voice recognition software,
- Screen reader,
- Magnifying tool,
- On-screen keyboard.

Operating system (OS) software for client and server computers

The basic computer application software been used includes:

a. Software for word processing, spreadsheets, presentations, and graphics;

b. Educational software applications; and

c. Internet-related and -delivered software, including browsers, Java applications, and interactive tools on websites

Operating System Software

Particularly in the area of software development, the open-source movement has taken off with the advent of the Internet, and people around the world are contributing their time and expertise to develop or improve software, ranging from operating systems to applications software that are used by systems in most offices.

As the programs' source code is freely available for use and/or modification, this software is referred to as open-source software.

For instance, the operating system software to be used on client or end-user computers depends on the type of hardware purchased for use. As an example, If Apple computers are purchased, Apple's OS, which comes with the computer, will likely be used on client computers. If computers with Intel or Intel compatible CPUs

are purchased, the computer would likely come with a version of the Microsoft Windows OS. Nevertheless, a larger and more robust network that may need to be securely managed will require special network operating system software installed on the network's server to manage the functions of the network, including links to printers and other peripherals, e-mail, file sharing, security functions, and communication among linked computers.

Open Source Software (OSS)

One of the most prevalent examples of open source software is the operating system Linux. It was first developed as a hobby by a Final year university student Linus Torvalds in 1991.

He first developed the version for himself, and then he made the source code of his operating system available to everyone who wanted to use it after which he improved on what he had done. Because of its unique stability, Linux has become the operating system of choice for Web servers, In addition to the Linux operating system, other open-source software has been gaining increasing popularity because of its stability and low cost. A common example of open-source application software is the Firefox Web browser and the office productivity suite Open Office. While there are many upsides to open-source software, some vendors still stress the "hidden" costs of running this software.

One largely debated topic by experts in this field is on the superiority of this open sourced software (OSS) when put to use in offices, schools, business organizations etc, as compared to those commercialized software products for client and server operating systems. Either way, I cannot give you the answer you would be expecting since it involves policy, commercial, technical, and educational concerns.

An example is that of the educational system, the ultimate factor to be looked out for in making technology decisions is if the software supports the learning needs of the student, assuming it's used by a school and if it helps the teacher in all ramification, then If the software and hardware solutions do not ultimately serve the teaching and learning process, then even "inexpensive" or "free" options can be very costly educationally.

Also If the key educational software programs cannot be used on systems with "free" OS software, then the "free" solution could become very expensive. Similarly, educational use and needs for computers are often quite different from corporate needs. That's why decision making about technology choices for schools needs to reflect these differences at all times.

One of the most popular open source software products used for computer operating system software. Linux became popular because it's available, free of charge and has a large development and user community. It is used only rarely as a client operating

system (on the end terminal or PC at the user's desk), mainly because few software applications, such as word processing, can be used on computers running Linux.

Benefits of Open Source Software (OSS)

The technical benefits of operating system and network operating system software are generally discussed in terms of the software's reliability, performance, scalability, security, and cost. A variety of comparisons have shown that servers running Linux crash less and perform better than commercial and other OSS software.

Secondly, Linux can be used on a wider range of computer platforms than any other operating system. It's also the most popular operating system software for Internet servers, accounting for about 30% of all Web servers in the world today.

Next, it is actually a more secure option than commercial Open Source Software.

Finally, several studies have shown that Linux and other open source software usually have significantly lower initial costs than commercial operating system software.

3.4 Networks

A network (computer network) is a collection of computers and other hardware components interconnected by communication channels that allow sharing of resources and information within and outside any office environment.

The scope in communication has increased significantly in the past decade; this wouldn't have been possible without continuous advancement in computer network and the technologies that make communication between networked computers possible. Wired and wireless networks actually allow computers, printers and other devices found in an office environment share internet access, files and other. It's often seen that a combination of wired and wireless network connections provides the most flexibility and ease of installation.

Fig: A wired and wireless network

LAN (Local Area Network):

A small network that physically connects nearby computers (within the firm, organization, or a household)

WAN (Wide Area Network):

A much larger network that covers a city or a region

Intranets and Internets

Messages within an office can be transmitted electronically (intranet) as well as around the universe (Internet). Office staffs are able to exchange information over the computer via the Net through e-mail which can be sent simultaneously to persons around the world.

Internet

It is known as a world network of connected computers, connected through WAN and LAN.

Intranet

The intranet is an internal computer network, used within a company, whereby relevant information such as telephone directories, calendars of events, procedure manuals, job postings, and human resources information, and general information about on-goings around the office can be posted and updated. With the intranet, one is able to communicate online with individuals within a designated work environment.

Extranet

The Internet is a global computer network that permits millions of computers around the world to communicate via telephone systems and other communication lines. They don't necessary have to be exclusively members of that organization, but also outsourced experts for performing common tasks.

It is also known as the digital information super-highway and is a part of the World Wide Web. The Internet is a public worldwide computer network full of information comprising of inter-connected networks that span the globe.

Web Pages

One of the services that can be used on Internet which enables us to view and search contents in a form of web-pages. Organizations and anyone who wishes to post information or sell products to do so, web page programs, such as Macromedia, Dream-weaver, and Site Rack, enable users to create their own Web pages. Such web page enables users to create their own Web pages. Other services on Internet that can gainfully applied in most offices.

1. Instant messaging (IM)
   Google Talk, Skype, Windows Live Messenger, Yahoo! Messenger
2. Voice over Internet Protocol (VoIP)
   Protocol used for voice transfer over IP network; basically enables staffs in the organization and users in general to simply make phone-calls
3. Really Simple Syndication (RSS)
   Used for dissemination of information or articles etc. published on web page using RSS channel,(RSS news usually consists of title, few sentences and link to a web page where users can read the whole article). Users have to subscribe to RSS channel in order to receive news in their RSS reader.

Web-based e-mail

Web mail is an Internet service that allows people within and around the same office to easily send messages and files to anyone around the world from any computer provided they are connected to the Internet. With a registered account, users can send and receive messages, images, and any other type of information.

E-mail is keyed messages sent from one computer screen to another, using a network linking the units. Sending messages from one computer to another between

colleagues, coworkers, helps to easy off the problems with communication in the office environment

Voice Mail

Voice mail is also another form of e-mail, more like words converted or digitized into electronic computer language. This form of communication is transmitted electronically by phone lines for immediate delivery or can be stored in a computer mailbox. The recipient is able to retrieve the message by dialing a code number to access the mailbox. The computer reconverts the message to the caller's voice and the recipient is able to hear the voice message.

Internet data transfer

Download – data obtained from internet and stored onto personal computer

Upload – retrieving data gotten from internet on personal computer back to internet server

SELF ASSESSMENT EXERCISE

Question 1:

Which device performs both as an input and an output activity at the same time?

Answer to the self Assessment Exercise

Answer Q1:

Touch screens, they enables the user to interact directly with what is displayed, rather than using a mouse, touchpad, or any other intermediate device (other than a stylus, which is optional for most modern touch screens).

4.0 CONCLUSION

The use of present day systems within and around the office environment has been proved in this unit that they cannot exist alone without software and this software can be easily understood mainly because they have been proven to be user friendly. There is also room for more and more improvements the area of software development that would become compactable with future hardware for office use

5.0 SUMMARY

This unit covered all you need to know about on software usage and application with respect to Hardware. The constant use of the word hardware cannot be overemphasized because this software was created just because this hardware exists. Also we discussed how and where to get these pocket friendly software known as Open source soft ware. Other applications where discussed like how information's can be sent and received using the required platform.

6.0 TUTOR-MARKED ASSIGNMENT/ ANSWERS

Question 1:

Q1. How can an organization reliably protect its facilities from such threats either viruses or man made threats?

Q2. What's the difference between a notebook and a Personal Digital Assistant - PDA (palm)?
Q3. What's the difference between a LAN, WAN, and Internet?
There are essential questions that should be addressed by the software engineer,
Q4. Which network operating system as a software engineer, should be used/ prescribed?
Q5. What technical support is really available and if the different options are cost effective?
Q6. What types of network operating system software is commonly used in office, schools, small businesses, and government agencies in your country or locality?
Q7. What types of network operating system software are presently been used?
Q8. Is the network operating system software also available in a language version to match languages commonly spoken by both technicians and users?
Q9. In terms of education, educating teachers and students with free software like Linux when do you think it becomes a More Expensive Choice?
. Proponents of using Linux in educational computer environments often emphasize the fact that Linux is "free," and that the money saved from not having to purchase operating system or network operating system software is a sufficient reason to use it. Unfortunately, this argument is flawed.
Operating system and network operating system software only account for approximately 8% of the total cost of buying a client computer system. In contrast, the ongoing costs to train teachers to integrate technology into teaching and learning, and to support and keep computer systems running from year to year, can be many times greater than the original purchase cost of the computer and the operating system or network operating system software.

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UNIT 3 IT AND E-BUSINESS ENABLING SOFTWARE

CONTENT

1.0 INTRODUCTION

Computer has taken over a lot of activities which bring into play various IT services.

2.0 OBJECTIVES

At the end of this unit, student should be able to:

- State the advantages of SFA
- Identify the disadvantages of SF

3.0 MAIN CONTENT

3.1 Sales Force Automation – Information system used in marketing and management that help automate sales and sales force management functions. When combined marketing information system (done frequently) they are called CRM. SFA automatically record all stage in a sales process which include contact management system, sales lead tracking system sub systems. Elements of SFA are sales forecasting, order management and product knowledge.

Advantages of SFA to sales manager – SFA automatically present easy to understand tables, charts or graphs of information on call sheet; activity reports, information request, order book and other information are sent more frequently; analyze automatically the information using sophisticated statistical technique presenting the result in a user friendly way giving the sales manager very useful information.

To marketing managers, SFA gives information that is useful in understanding the economic structured of the industry, identifying segment within the market, identifying target, identifying best customer in place, developing new products and others marketing manager duties.

To the Company, SFA create competitive advantage by increasing productivity, efficient effective time management of sales manager and staff. Management response time reduced due to better communication with field sales staff thus company become more alert and more agile; increase customer satisfaction which in turn lead to increased customer loyalty, reduced customer acquisition costs, reduced price elasticity of demand and increase profit margins.

DISADVANTAGES

Some user's claim that it is difficult to work with; require additional work i.e. inputting data, dehumanize a process that should be personal; require continuous maintenance, information updating and system upgrading, and difficult to integrate with other MIS

SELF ASSESSMENT EXERCISE

SFA bring into play some advantages, enumerate such advantages.

Answer to the Self Assessment Exercise

To the Company, SFA create competitive advantage by increasing productivity, efficient effective time management of sales manager and staff. Management response time reduced due to better communication with field sales staff thus company become more alert and more agile; increase customer satisfaction which in turn lead to increased customer loyalty, reduced customer acquisition costs, reduced price elasticity of demand and increase profit margins.

4.0 CONCLUSION

SFA, Information system used in marketing and management that help automate sales and sales force management functions particularly in e- business environment.

5.0 SUMMARY

This unit explains SFA function,, so also discussed the advantages to the sales manager, marketing manager as well as the company, further elucidate the disadvantages that it is difficult to work with; require additional work i.e. inputting data, dehumanize a process that should be personal; require continuous maintenance

6.0 TUTOR MARKED ASSIGNMENT

State and explain five e-business enabling software

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UNIT 4**:** MANAGING PEOPLE IN THE ORGANIZATION.

1.0 INTRODUCTION

If an office is not properly managed, it becomes difficult to produce desired result, even if they have the desired information technology at the required standard, it would be difficult to produce results.

This unit would help point out roles of management in any office, also point out the important role of planning and any organization.

2.0 OBJECTIVE

After studying this unit, students should be able to:

- Understand the manager's job, and why certain decisions are been made.
- Understand managers ability to "make sense" out of the many situations faced by organizations and how they formulate action plans to solve organizational problems.

3.0 MAIN CONTENT

3.1MANAGEMENT

Managers perceive business challenges in the environment, they set the organizational strategy for responding and allocate the human and financial resources to achieve the strategy and coordinate the work. Throughout, they must exercise responsible leadership. Management's job is to "make sense" out of the many situations faced by organizations and formulate action plans to solve organizational problems, which is actually the hopes, dreams, and realities of real-world managers. But, in other to attain this, managers must do more than manage what already exists. They must also create and even re-create new products and services in the organization from time to time. A substantial part of management responsibility is creative work driven by new knowledge and information. Information technology can play a powerful role in redirecting and redesigning most organizational plans.

Note; Managerial roles and decisions vary at different levels in any organization. Senior managers are saddled with the responsibility of making long-range strategic decisions about what products and services to produce.

Middle managers carry out programs and plans of senior management. Operational managers are responsible for monitoring the firm's daily activities. All levels of management are expected to be creative, to develop novel solutions to a broad range of problems. Each level of management has different information needs and information system requirements.

The duties of a manager cannot be over emphasized, More often than not they a saddle with series of responsibilities if the organization must succeed. These responsibility include,

i. Planning: Planning is the key management function of any extension worker. It is the process of determining in advance what should be accomplished, when, by whom, how, and at what cost.

It also includes outlining philosophy, policy, objectives, and resultant things to be accomplished, and the techniques for accomplishment.

ii. Organizing: Establishing structures and systems through which activities are arranged, defined, and coordinated in terms of some specific objectives.

iii. Directing: Making decisions, represent decisions in instructions, and serving as the leader of the enterprise.

iv. Coordinating: Inter-relating various parts of the work as it relates to the office.

v. Reporting: keeping informed those to whom you are responsible, both staff and the public.

vi. Budgeting: Making financial plans, maintaining accounting and management control of revenue, and keeping costs in line with objectives.

Planning

Regardless of whether it is planning long-term program priorities or planning a two-hour meeting, the planning aspect of management is the major contributor to success and productivity.

Planning is the process of determining the organization's goals and objectives and making the provisions for their achievement. It involves choosing a course of action from available alternatives.

Planning is the process of determining organizational aims, developing premises about the current environment, selecting the course of action, initiating activities required to transform plans into action, and evaluating the outcome. Planning at managerial level usually depends on their level in the organization followed by the type and size of the organization.

Generally there are **four major types of planning** exercises:

1. Strategic,
2. Tactical,
3. Contingency, and
4. Managerial.

Strategic planning occurs at top management level, it involves determining organizational goals and how to achieve them.
Tactical planning occurs at middle and lower management level, it is concerned with implementing the strategic plans for the organization.
Contingency planning anticipates possible problems or changes that may occur in the future and prepares to deal with them effectively as they arise (Marshall, 1992).
Managerial planning helps in combining resources and expertise to fulfill the overall objectives of the organizations extension.

- Strategic Planning
  Strategic planning has been defined as that which has to do with determining the basic objectives of an organization and allocating resources to their accomplishment. strategy determines the direction in which an organization needs to move to fulfill its mission. It also acts as a road map for carrying out the strategy of any office and achieving long-term results. Occasionally a large gap exists between the strategic plan and real results. To boost organizational performance, people must be a key part of the strategy.
  Strategic planning is different from long-term planning. While long-range planning builds on current goals and practices and proposes modifications for the future. Strategic planning, however, considers changes or anticipated changes in the environment that suggest more radical moves away from current practices. When doing strategic planning, the organization should emphasize team planning. By involving those affected by the plan, the manger builds an organization wide understanding and commitment to the strategic plan (Flemming, 1989). The elements of strategic plans include:
- Organization mission statement – What
- Strategic analysis – Why
- Strategic formulation – Where
- Long-term objectives implementation - When and How
- Operational plans - When and How
  These plans form the framework for focusing organizational resources on the most strategic areas by using a staged approach. Updated plans are then implemented by work teams at all levels of management. Work-team objectives include:
  1. Involving all levels of staff in consultation
  2. Designing and implementing a process to develop-goals and objectives for the organization and unit; a strategic process for the next five to ten years
  3. Defining and clarifying organizational structures and identifying functions, customers, and service delivery models
  4. Identifying changes and staged approaches needed to move from the current situation to what will be required over the next three to five years

5. Identifying and recommending priorities for policy and program development
6. Incorporating goals for expenditure reduction, service quality improvement, workforce management, accountability, technology, and business process improvement
7. Stating the start date and first report date, this way departments would take their assigned duties seriously as there would be an expected date of completion.

- Managerial Planning

Managerial planning focuses on the activity of a specific unit and involves what needs to be done, by whom, when, and at what cost. The strategic planning process serves as an umbrella over the management planning process which deals with the following:

1. Establishing individual goals and objectives.
2. Forecasting results and potential problems.
3. Developing alternatives, selecting alternatives and setting priorities.
4. Appraising how the management unit has succeeded in meeting its goals and objectives.

Decision making

Closely related to both strategic and managerial planning is the process of decision making. Decisions need to be made wisely under varying circumstances with different amounts of knowledge about alternatives and consequences. It's concerned with the future and may be made under conditions of certainty, conditions of risk, or conditions of uncertainty

Decisions are.

Under conditions of certainty, managers have sufficient or complete information and know exactly what the outcome of their decision will be.

Managers are usually faced with a less certain environment. They may, however, know the probabilities and possible outcomes of their decisions, even though they cannot guarantee which particular outcome will actually occur.

In such cases, there is a risk associated with the decision and there is a possibility of an adverse outcome. Most managerial decisions involve varying degrees of uncertainty. This is a key part of a manager's activities. They must decide what goals or opportunities will be pursued, what resources are available, and who will perform designated tasks. Decision making, in this context, is more than making up your mind. It consists of several steps:

Step1: Identifying and defining the problem

Step2: Developing various alternatives

Step3: Evaluating alternatives

Step4: Selecting an alternative

Step5: Implementing the alternative

Step6: Evaluating both the actual decision and the decision-making process

The structure of every organization is unique in some respect, but all organizational structures develop or are consciously designed to enable the organization to accomplish its work. Typically, the structure of an organization evolves as the organization grows and changes over time.

Researchers generally identify four basic decisions that managers have to make as they develop an organizational structure, although they may not be explicitly aware of these decisions.

1. Division of labor. The organization's work must be divided into specific jobs.
2. Departmentalization. Unless the organization is very small, the jobs must be grouped in some way.
3. Span of control. The number of people and jobs that are to be grouped together must be decided, which is related to the number of people that are to be managed by one person.
4. Authority. The way decision-making authority is to be distributed must be determined.

In making each of these design decisions, a range of choices are possible. At one end of the spectrum, jobs are highly specialized with employees performing a narrow range of activities; while at the other end of the spectrum employees perform a variety of tasks. In traditional bureaucratic structures, there is a tendency to increase task specialization as the organization grows larger. In grouping jobs into departments, the manager must decide the basis on which to group them. The most common basis, at least until the last few decades, was by function. For example, all accounting jobs in the organization can be grouped into an accounting department; all engineers can be grouped into an engineering department and so on.

Advantages of Information Technology and Management

In developing countries, entrepreneurs, managers in the public and private sectors are investing in new information and communication technologies, including e-mail, the Internet, wireless telephony, and business software to assist in running their day-to-day operations.

The **advantages** in efficiency, outreach, and cost savings in these new services are:

1. Improvement in business communications with customers, suppliers, and partners
2. They enhance the ability to access large quantities of information quickly and cheaply; easily and at a much cheaper rate, and
3. They provide a means to expand management capabilities, and safely protect data, resulting in better record keeping for financial managers, better customer analysis for sales and marketing managers, and better production statistics for line managers.

However, these improvements are not without risk, on both the physical assets and to less tangible information assets.

SELF ASSESSMENT EXERCISE

Q1 How do managers combine order and chaos in a way that optimizes both?

Answer to Self Assessment Exercise

A1. (a) The ability to continuously scan the external environment, locates and analyzes emerging developments, quickly turn the resulting information into actionable decisions;

(b) The capacity to quickly and easily make decisions and, more important, move resources from where they are to where they need to be to activate these decisions; and

(c) The ability to create, adapt and use information and knowledge to not only improve current operations, but also constantly challenge current ways of thinking and operating.

4.0 CONCLUSION

We have succeeded in understanding the importance of managing people staffs in any organization properly to produce the desired result would require some kevel of determination on the part of those involved and their ability to make strategic plans. It's also important to state that this unit can also be reviewed to be able to demonstrate how management in an office can perform their duties easier and faster, and how much training can/ should be given to staff with respect to information technology as opposed other than the use of manual equipment to do the given task as the level of competence wont and cannot be measured which in turn would be regarded as bad management tactic and no manager want to be called that.

5.0 SUMMARY

In managing people in any organization, planning and strategy would be useful in making required useful decision……

6.0 TUTOR-MARKED ASSIGNMENT/ ANSWERS

Strategic planning occur at which level of management? Justify your answer.

7.0 REFERENCE/ FURTHERREADING:

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- Concepts of information and communication technology, notes-ITdesk.info (http://bit.ly/1E8fNxR)
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MODULE 4: INFORMATION SECURITY.
Unit1: information technology strategies
Unit 2: The future for information technologies.

UNIT1: INFORMATION TECHNOLOGY STRATEGIES

CONTENTS

INTRODUCTION

This unit covers all security plans and strategy to move the office/ organization forward. It's possible to have desired information technology in your office and still not be able to function properly because the organization is still been threatened by quite a no of factor, ranging from natural causes to technical issues, human errors/ faults, malicious software, intentional attacks, computer crime, and international terrorism these and more were also treated.

OBJECTIVE

- The importance of securing important official information from any impending dilemma electronically (from the use of computers)
- How to deal with any issue that may have risen from the use of these computers.

- To know common errors people/ office staffs make that introduce these issues and be able to avoid them.
- What information really means different organizations and how they apply them?
- To know what standards on information security there are and be able to follow.

3.0 MAIN CONTENT

3.1 INFORMATION SECURITY

The Internet has no owner, no rules and limits are in place to regulate the use of personal information and prevent it been wrongly used by third parties. Serious security problems are also associated with other Internet-based services, such as e-mail, file transfers, etc.

A failure to secure information may consequently result in irrecoverable losses and harm the credibility of an organization or country. ICT systems and data processed by such systems may be made dysfunctional due to a Number of various factors. They, for example, include natural factors, technical failures, human errors and faults, malicious software, intentional attacks, computer crime, and international terrorism. The Internet enables mutual communication between information resources and information seekers, either in public or commercial sectors, or among individuals. Information in the wrong hands the consequences may be devastating, particularly in some specific areas. The state is therefore obliged to ensure that information is protected against misuse, and to minimize consequences where such misuse has occurred.

Information is an important value to companies and government agencies, that's why each organization builds a unique system that is quite supportive of its goals, and must therefore be protected appropriately. Information today is either created, stored, transported, or processed at least impart using information technology (IT). In the industry and administrations, no one denies the necessity to adequately protect its IT landscape regardless of its organizational size. Information Technology security incidents such as the disclosure or manipulation of information can have wide-ranging, adverse affects to a business or can prevent the organization from performing its tasks, resulting in high costs.

IT security primarily deals with protecting information stored electronically and with its processing.

The classic core principles of information security, namely confidentiality, integrity and availability, form the basis for its protection. Many users also include additional basic values in their examinations. They can also be very helpful, depending on the corresponding application case. Additional generic terms used in information security include, for example, authenticity, validity, reliability, and non-deniability. As the following examples illustrate, information security is not only threatened by willful acts such as computer viruses, interception of communications or computer theft:

- After an unsuccessful software update, applications cease to function or data has been modified without being noticed.
- An important business process is delayed because the only staff members familiar with the software application are ill.
- Confidential information is inadvertently passed on to unauthorized persons by a staff member because documents or files have not been marked "confidential".

Maintaining information security and making continuous improvements
Establishing information security is not a project with a limited timespan but a continuous process. The appropriateness and effectiveness of all elements of the information security management system must be checked continuously. This means that not only individual information security safeguards must be checked but also that the information security strategy must be reviewed on a regular basis.
The implementation of information security safeguards should be evaluated at regular intervals by means of internal audits. These also serve the purpose of collating and evaluating the experiences made in day-to-day practice. In addition to audits, it is also necessary to perform drills and implement measures for increasing staff awareness

Strategic information technology
To enhance the effectiveness of information technology management, there are several governing strategies based on certain fundamental principles and philosophies for achieving specific goals Strategic information technology.
General Strategy,
The strategic plan will address several inter-related projects—each can be managed separately, but will be closely coordinated to ensure that inter-dependencies are identified and the common information technology and data standards are deployed. For the existing technical
Standards, they will be adopted wherever practical. The information technology infrastructure is to be managed separately from the application software and the data, recognizing that each component application software, data, infrastructure has a distinct life cycle.
Strategy
The main task in information security is to develop a uniform platform for the building of information society, based on legal principles and ensuring adequate protection, In order to accomplish this task, it is necessary to create a National Strategy for Information Security in your country, organization, and also as a basic national document and, subsequently, to elaborate on and implement the specific tasks as defined under such strategic documents of most advanced information societies, or other bodies responsible for information security. They can be issued by the European Union or other bodies responsible.

Strategic objectives

The European Union (EU) strategy says it is necessary to promote global cooperation in information security and ensure that European industry is user, demanding high-level security products and services and, at the same time, their competitive provider as well. The second basic requirement of the EU is to standardize Member States' national policies pertaining to information security. When seeking to meet these requirements, the principles of a democratic society should be observed and legitimate interests of citizens, organizations, the business sector and public administration taken into account. The following strategic objectives have been set in order to ensure and maintain the necessary level of information security under the strategy:

1. Prevention: to ensure adequate protection of the organizations space and data so as to prevent the occurrence of security incidents in any/ many ways possible.
2. Readiness: The wiliness to ensure effective respond to security incidents and the time necessary to restore the operation of information and communication systems after an incident has occurred.
3. Sustainability: To maintain and upgrade the organization's competence in information security. Its best practice that before policies are agreed upon as it relates to Security Strategy, they should first be deliberated upon and only the policy that are approved upon by National Council would be.

The meeting of the set objectives requires that the state ensure cooperation of all government bodies, special state administration, academia, the private sector and citizens. An essential role the state plays in this intricate process is to create a suitable legislative environment and provide organizational, material and financial resources. Government tasks also include a consistent control of the fulfillment of action plans and imposing sanctions for their non-fulfillment, and a flexible response to changes in external conditions.

Information Infrastructure Strategies

A robust architecture-information technology infrastructure will be implemented. The International Bureau, with advice from The Standing Committee on Information Technologies (SCIT) will implement an information technology infrastructure based on open system.

A secure network will be implemented to interconnect intellectual property offices. At the beginning, a virtual private network and Internet technology will be used.

Strategic priorities

A relevant legislative framework needs to get rid of technical issues, organizational issues, financial issues, hierarchy and management issues and education issues in order to meet the set strategic objectives. There are basic strategic priorities that can be defined as follows:

1. Protection of human rights and freedoms.
2. Building of awareness and competence in information security.
3. Creation of secure environment.
4. Improvement of effectiveness in information security management.
5. National and international cooperation
6. Enhancement of national competence

3.2 INFORMATION TECHNOLOGY STRATEGIES

In small organizations (smaller offices in organizations), provisions for IT security may be simple, with each person holding fast his/ her own responsibility for personal computer and flies been. However, for rather larger groups, groups that are engaged in commercial transactions, maintain confidential data for customers or public citizens, the need to establish formal security policies and procedures becomes more important. Usually when managers and their staff consider the issue of IT security, regardless of the organization the run, they will all have similar concerns. Each group will want a certain level of security for their data, procedures that are clear and easy for employees to follow.

In addition to these general needs, each type of organization has special concerns related to its mission and goals. Offices heads must emphasize information security policies in the appropriate context in order to pursue stated objectives effectively .Also offices heads shouldn't leave out the importance of the cost involved with implementing good security practices these procedures and technologies are investments and should be properly evaluated against the costs of potential losses

Small and Medium-Sized Businesses

If you are running a small or medium sized business, your top priority would be profit, customer service, business continuity, sustainability, and. Actually SMEs are also bound by local, regional, or national laws and may be accountable to a range of authorities, depending on the business they are engaged in and the business environment of the country in general. Therefore their Security idea first would be focused on two main areas:

a. Enterprise data protection from corporate spies or attackers and
b. Customer data protection, including credit card and transaction information.

Non-profit Organizations

In non-profit organizations, your managers and employees are more focused on their effectiveness in the field, coordination with communities and partners, and reputation. The security of such organizations would be very low or of no importance because first of all their systems would be of very low standards. This is expected from most non-profit organizations due to the budget constraints thus they will first be facing a substantial challenge as they seek to provide uninterrupted service to their constituencies and maintain a positive image to their donors, peers and sometimes those overseers.

Universities

As with non-profits organizations, budget constraints, disbursed networks, and a wide range of technological skill are present in the university systems.

Universities may face a greater number of internal threats, from students who may find hacking as a new challenge in the institutional system and engage in it pastime. In addition, universities may be operating under a set of unique internal policies more like government regulations they usually would need to comply with.

In the university environment, the personal data protection is extremely important, as student files include much sensitive information including identification numbers, health records of students and staff alike, and academic transcripts. Potential attackers could steal, modify, or destroy such data, causing serious damage to the credibility and effectiveness of the university system.

Government Agencies

In government agencies, IT deployments may be assessed in terms of efficiency, ease-of-use, and ability to link up with other departments and agencies as needed. While profitability is generally not relevant in the governmental context, like non-profits, there are often budget controls that limit the agency's ability to acquire the latest in hardware and software security. At the same time, governments must be keenly focused on data protection in targeted environment, as their databases contain sensitive information on individuals, including personal identification, health, criminal, and tax records. Unfortunately, even in industrialized countries, data protection in government agencies lags behind the information security train and suffers from antiquated systems, inadequate funding, and overworked staffs that lack then core competencies in IT security owing to the fact that they are not trained.

3.3 INTERNATIONAL COOPERATION IN INFORMATION SECURITY

This is necessary in order to ensure compatibility of solutions and sufficient level of protection of the global ICI. International cooperation is equally necessary due to the complexity of the area of information security as such, resulting in a situation where majority of countries do not have sufficient capacities to build the necessary know-how individually, and development and implementation of necessary solutions may take undesirably long even for the most advanced countries.

Norms and standards

International standardization organizations (ISO) publish also norms stipulating security requirements with respect to information and communication systems.

Standards

Standards are intended to codify the successful practice of security in an organization. They are generally phrased in terms of "shall." Standards generally are platform independent, and at least imply a metric to determine if they have been met.

They are developed in support of policy, and change slowly over time. They might also cover such issues as how to screen new hires, how long to keep backups, and how to test UPS systems. This standard does not name a particular backup mechanism or software package. It clearly states, however, what is to be stored, how long it is to be stored, and how often it is to be made.

3.4 SECURITY, COSTS AGAINST BENEFITS

One of the most difficult tasks is weighing up the costs for information security against the benefits and risks. It is initially very important to invest in measures that are particularly effective or that can provide protection against especially high risks. Experience shows that the most effective measures are not always the most expensive. It is therefore essential to understand the dependence of the business processes and tasks upon information processing so that appropriate information security safeguards can be selected.

At this point it should be emphasized that information security is only ever achieved by interaction between technical and organizational measures. The investments in technology can be read in the budget directly.

In order to justify these costs, the security products must be deployed in such a manner that they are of maximum benefit. The products must therefore have been carefully selected for the purpose that they should serve and must be operated in the appropriate manner, i.e. they must be integrated in the holistic security concept and staff members must be trained in how to use them. Technical solutions can also be replaced by organizational security measures. However, experience has shown that it is more difficult to ensure organizational measures are implemented consistently.

3.5 A BRIEF DISCUSSION OF THE ROLE OF AN INFORMATION SECURITY MANAGEMENT SYSTEM (ISMS)

A management system describes the people, processes and technologies used to focus and manage the activities of any organization. Each organization often develops its own unique structure that is quite supportive of the goals of that organization.

Each office does reflect different disciplines depending on the values and culture of the organization. So, we see offices defined with very different areas of focus such as enterprise management, environment, health, safety, quality, web content, personnel, risk and other important issues with different emphasis on security factors such as the well-known triad of confidentiality, integrity, availability, or on privacy or product assurance. Though individual organization builds a unique system, the management systems have several common elements, ease for improvement. Study of management systems has shown that there are several common elements which include policy, planning, implementation and operation, performance assessment, improvement, and management review.

ISMS, is that risk management strategy of the organization chartered and empowered by the Security Policy Statement, and managed by the Information System Security Officer because its focused on managing information security within an organization, a topic that is of growing concern to many organizations as they deal with the challenges presented in the information society and natural threats (fire, flood, earthquake) or human induced (viruses, SPAM, privacy, hacking, industrial espionage) security challenges.

The information protected doesn't just residing in electronic format on computer or network, it includes paper-based information and extends to intellectual property, therefore, Properly implemented can be effectively used by either small or larger organizations, and can be tailored to protect information in diverse organizations including data processing centers, software development, e-commerce, health care organizations, finance, manufacturing, service organizations, non-governmental organizations, universities and colleges of education, and not-for-profit organizations.

How does an ISMS support information security?

An effective implementation of the framework ensures that a management team, extensively committed to information security, provides appropriate resources to support the processes each organization needs to achieve appropriate information security, Provides appropriate resources to support the processes that the organization needs to achieve appropriate information security, a procedure that includes the basic management of the system, training and awareness. It emphasizes a risk management process that guides the choice of safeguards and, coupled with the metrics necessary to ensure that chosen controls are implemented correctly. Companies operating across several jurisdictions have the added challenge of ensuring identified and compliance of regulations like this.

Note: ISMS is an organization-specific, information security roadmap. Its documentation includes:

- Security Structure Organization Chart
- Risk Management Strategy
- Information System Security Officer job description
- Management Security Forum charter
- ISMS Document Control Plan
- Security Risk Assessment
- Statement of Applicability
- Customer Code of Conduct
- Security Perimeter Demarcation drawings

The benefits of using ISMS,

Organization operating the standardized ISMS framework can be rest assured that they are measuring and managing their information security processes in a structured manner, reflecting best practices that can be controlled and hone their system to meet

their official and business needs. Such a framework is a tried and tested tool that helps organization ensure that security-resource is spent on the most effective areas for the business.

Security Policy Statement,

The Security Policy Statement is a general, top-level statement of intent for upper management, similar to a "Mission Statement." Its intent is to show upper management's commitment to information security goals, and hence, empower the Security Organization Structure. The Security Policy Statement includes statements to the effect that the policy of the organization is that:

• Confidentiality of information will be assured
• Integrity of information will be maintained
• Regulatory and legislative requirements will be fulfilled
• Availability of information to authorized users will be met
• Information security training will be available to all staff
• Breaches of information security, actual or suspected, will be reported to, and investigated by the Information System Security Officer.

The non-specific nature of the Security Policy Statement does make it appropriate for public disclosure.

The duties of an Information System Security Officer

A formal job description or better put principal duties of an Information System Security Officer after he/she has been identified, appointed, and empowered would include:

• Establish and review the Security Risk Assessment
• Record and resolve security incidents
• Lead the Management Security Forum
• Prepare Management Security Forum security briefs
• Lead the Incident Response Team
• Maintain the Statement of Applicability
• Evaluate changes in asset base and resultant security implications
• Consult and advice on general information security issues
• Select controls and risk mitigation
• Monitor ongoing compliance with security standards
• Establish and maintain contacts with external security resources

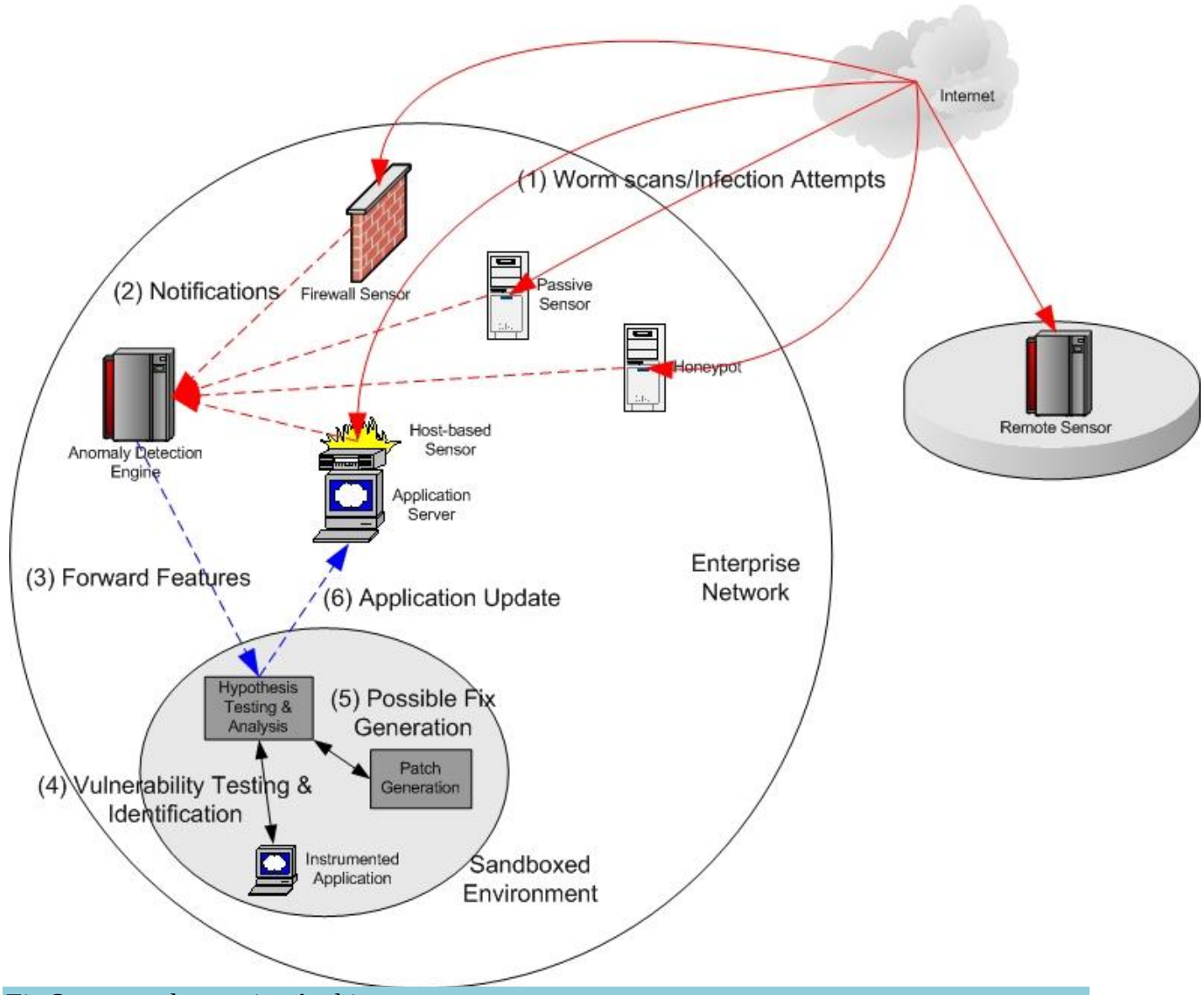

Fig 3.: network security Architecture

Security Management

The Security Management is one which consists of the Chief Information Officer, Engineering Manager, Data Center Manager, and the Information System Security Officer. Other members could be included as required.

Management Security Forum duties include:

- Develop security objectives, strategies, and policies
- Discuss status of security initiatives
- Provide ongoing management support to the security process
- Obtain and review security briefings from the Information System Security Officer
- Serve as an alternative channel for discussion of security issues
- Yearly review and approval of the Information Security Policy

• Yearly review and approval of the ISMS
• Review security incident reports and resolutions
• Formulate risk management thresholds and assurance requirements

Security Response

Incident Response Team – formed to create and carry out an Incident Response Plan. The team should include various skill sets covering all aspects of an organization's Information Processing Systems. Tools are procured, same way members are trained, and rosters established. The team is saddled with the Incident Response mission to:

• Prepare for an incident
• Identify an incident
• Control the incident
• Eliminate the intruder
• Recover from the intrusion
• Learn from the incident

Methodologies include processes to:

• Identify, escalate, and de-escalate security events
• Assess organizational security
• Maintain organizational security

External Liaisons- This could be easily established with local law enforcement agencies within and around the organization, as well as with legal and public relations entities. For business enterprises it creates a trust worthy look to intending customers and for organizations and offices it goes a long way to installing fear in the mind of the employees.

Security Maintenance,

Exploit Tracking option- qualified specialists in different organizational networking elements are tasked with tracking relevant exploits and reporting information of concern to the Information System Security Officer in that organization.

Change Control Board –The change control process includes change submission request and evaluation, as well as recovery and back-out procedures. In addition, a Document Control plan is initiated to control the ISMS documentation.

Security Infrastructure,

a. Plans/Programs are hence developed to meet information security goals. These Plans and programs can address:
   • Information security awareness
   • Change control
   • Incident response
   • Intrusion detection
   • Business continuity
   • Acceptance test

b. Guidelines are established to formalize adoption of information security best practices. Guidelines usually address:
   • Organizational security
   • Access control
   • Data protection
   • Router configuration
c. Policies are established to communicate conceptual information security organizational goals in the Information Security Policy.
d. Standards – They're established to support the implementation of Information Security Policy. Standards can address:
   • Personnel security
   • Employee conduct
   • Data classification
   • Data labeling
   • Data encryption
   • Data recovery
   • Data routing
   • Access control
   • Firewall standard
   • Network security
   • Network application
   • Data switching
   •Logging
   •Data transmission
   • Alarm
e. Procedures, established to detail information security implementation in support of relevant standards and policies. Procedures can address:
   • Risk management
   • Backup/Restore
   • System user add/delete/modify
   • Customer provisioning
   • Equipment maintenance
   • Asset control
   • Alarm
   • Security maintenance
   • Terminal server add/modify/delete
   • Password/shared secret change
   • Firewall setup
   • Incident response

   Security Education,

Security Awareness Program – personnel must have the knowledge to understand the significance of their actions. Human interaction may act in ways that undermine security controls, causing security breaches. A Security Awareness Program is chartered to:

• Clarify why security is important and controls are needed
• Clarify employee security responsibilities
• Serve as a forum to discuss security questions

The Security Awareness program should include “new hire” orientation, and ongoing refresher
activities.

A brief history of ISO/IEC 27001, and the increased international use of ISMS

BS 7799-1, the "Code of Practice for Information Security Management" began life as a British standard. First published in 1995, it contained best practice security controls to support industry and government organizations in the implementation and improvement of information security. Once it was published, organizations recognized the value in a common framework and its popularity grew. In 1998 BS 7799-1 was revised, taking into account identified improvements and updates adding new controls in consideration of the developing technologies in the field such as e-commerce, mobile computing and third party activities. The international interest in the code of practice (part 1) led to its submission as the basis for an ISO standard. Subsequently ISO/IEC 17799 was published as an international standard in December of 2000. ISO/IEC 17799 is now maintained within the remit of Working Group 1 of the information security committee ISO/IEC JTC1 SC27 "IT Security Techniques". It is impossible to ascertain those organizations using ISO/IEC 17799 presently, but it is known as the most popular security standard in terms of sales, and is referenced not just by BS 7799-2 but by a host of other frameworks and guidelines. After BS 7799-1 was development in 1995, came the need to define the management system to host the controls in the "Code of Practice" was identified and BS 7799-2: "Specifications for Information Security Management Systems" was developed. In order to align BS 7799-2 with the quality management system standard ISO 9001:2000 it was revised and re-published in 2002. Other countries published their own national standards substantially based on BS 7799 including the Netherlands (SPE20003), Australia/New Zealand (AS/NZS 4444), Denmark and Sweden (SS627799), and India (IS14357:2002). BS 7799 was also translated into different languages, and it can now be obtained in Chinese (Mandarin), Danish, Dutch, French, German, Japanese, Korean, Swedish and so o. The definition of the ISMS itself is given by ISO/IEC 27001:2005. Defining the fundamental best practices of the management system, this standard ensures that a risk assessment is made, and that this is used to correctly select the safeguards from the code of practice given in ISO/IEC 27002 (17799:2000). A "statement of applicability" documents the

applicable safeguards and is a flexible document, depending on the vulnerabilities and threats that have been identified for the organization in question.
The structure of the standards
ISO/IEC 27001 is designed to be of a general use, i.e. provide consistency between, disparate organizations. The organization in question can be a university or a collage, Multi-national Corporation through to a small project team, a small business, or even a non-commercial organization.

ISO standards for information security

In the international standards organizations ISO and IEC, it was decided to consolidate the standards for information security in the 2700x series since the number of standards is constantly increasing. The most important standards here are:
- ISO 13335
The ISO 13335 standard "Management of Information and Communications Technology Security" (formerly "Guidelines on the Management of IT Security") is a general guide for initiating and implementing the IT security management process. It provides instructions but no solutions for managing IT security. The standard is a fundamental work in this area and is the starting point or reference point for a whole series of documents on IT security management.
- ISO 17799
The aim of ISO 17799 "Information Technology – Code of Practice for Information Security Management" is to define a framework for IT security management. ISO 17799 is therefore primarily concerned with the steps necessary for developing a fully-functioning IT security management and for integrating this securely in the organization. As defined by ISO 17799,
Information security is characterized as the preservation of:
• Confidentiality: ensuring information is accessible only to those authorized to have access.
• Integrity: safeguarding the accuracy and completeness of information and processing methods.
• Availability: ensuring that authorized users have access to information and associated assets when required.
As a standard that is primarily conceptual, ISO 17799 is actually not:
• A technical standard
• Product or technology driven
• An equipment evaluation methodology such as the Common Criteria/ISO 15408which deals with functional and assurance requirements of specific equipment
• Related to the “Generally Accepted System Security Principles,” (GASSP) which is a collection of security best practices
• Related to the five-part “Guidelines for the Management of IT Security”, or GMITS/ ISO

The necessary IT security measures are touched on the pages of the ISO/IEC 17799 standard. The recommendations relate to the management level and contain almost no specific technical information. Their implementation is one of the many options available for fulfilling the requirements of the ISO 27001 standard.

- ISO 27001

Due to the complexity of information technology and the demand for certifications, numerous manuals, standards and national norms for information security have emerged over the past several years. The ISO 27001 "Information Technology (Security Techniques) Information Security Management Systems Requirements Specification" is the first international standard for management of information security that also allows certification.

ISO 27001 provides general recommendations on around ten pages for, among other things, the introduction, operation, and improvement of a documented information security management system that also takes the risks into account. The controls from ISO/IEC 27002 are referred to in a normative annex. The readers however, are not provided with any assistance for the practical implementation.

- ISO 27002

The goal of ISO 27002 (previously ISO 17799:2005), "Information technology – Code of practice for information security management", is to define a framework for information security management. ISO 27002 is mainly concerned with the steps necessary to establish a functioning security management system and anchor it in the organization. The necessary security safeguards are described briefly in the approximately 100 pages of the ISO standard ISO/IEC 27002. The recommendations are primarily intended for the management level and do not contain much specific technical information for this reason. The implementation of the security recommendations in ISO 27002 is one of many ways to fulfill the requirements of ISO Standard 27001.

Note: Standard ISO 17799 was merged into ISO 27002 at the beginning of 2007 without effecting any changes to its contents in order to underscore the fact that it belongs to the ISO2700x series of standards. It is also not appropriate to describe them in detail here, but by looking at the various high-level paragraphs of the standard the breadth of activities can begin to be appreciated. This code of practice cannot address every situation, and the standard allows further controls to be specified when needed. The control areas include:

• Security Policy
• Organizational of Information Security
• Asset management
• Human Resources Security
• Physical and Environmental Security
• Communications and Operations Management

• Access control

- Information Systems Acquisition, Development and Maintenance
  • Information Security Incident Management
  • Business Continuity Management
  • Compliance

- ISO 27005

This ISO Standard "Information security risk management" contains general recommendations or risk management for information security. Among other items, it supports the method for risk management is prescribed. ISO/IEC 27005 replaces the previous standard ISO 13335-2. This standard, ISO13335 "Management of information and communications technology security, Secondly, it provided guidelines for the management of information security.

- ISO 27006

ISO Standard 27006 "Information technology - Security techniques - Requirements for the accreditation of bodies providing certification of information security management systems" specifies requirements for the accrediting of certification bodies for ISMS and also handles specific details of the ISMS certification process.

- Other standards in the ISO-2700x series

The ISO 2700x series of standards will probably be made up of ISO standards 27000–27019 and 27030–27044 in the long term. All standards in this series handle different aspects of security management and are based on the requirements in ISO 27001. The other standards should contribute to improved understanding and the practical application of ISO 27001. They handle, for example, the practical implementation of ISO 27001, i.e. with the measurability of risks or with methods for risk management.

The benefits of implementing ISMS may be divided into two major groups: internal and external benefits.

The internal benefits include:

- Heads of management gets an independent review and report of the strength and weakness of the organization’s ISMS.
- People/ employees have the tendency to follow rules and regulations if they believe that they could/will be audited.

The external benefits include:

- The reputation of an organization can be of vital importance to an organization working in the information fields. Just one published security incident can destroy years of work and significantly affect the good-will value, research has show that the value of a company can be affected by an incident.
- If your organization's sector is one in which information security is valued, then a certified ISMS can offer a differentiator between you and your competitors. "Would

you rather do business with a company that has an accredited third party's assurance that the management system for information security is solid enough, or one that doesn't?"

- Certification by an accredited certification body may offer you a defense should you ever be subjected to litigation in relation to information security related legislation. If you can prove that you follow industry best practices then perhaps you may make the case that you had taken reasonable precautions.

There are some basic steps of certification.

a) For an organization to be fully certified, commitments from leading heads throughout the process are essential and vital to success.
b) Define and implement the system. Make sure that you think very carefully and understand the implications of your chosen scope. There are several guidelines and consultants who can help you achieve this before you go ahead and deal.
c) . Hang the certificate on the wall! It's simple but extremely important/ effective.
d) Be ready for surveillance audits designed to ensure that you are maintaining and improving on the standard that you initially achieved.

Common pitfalls,

The typical pitfalls in implementing ISMS are related to:

• Lack of Senior Management's commitment

• Scope issues: insufficient, inaccurate, or even completely inappropriate

• Awareness of employees: Many organizations face the challenge of ensuring that their staffs are aware of the applicable policies such as activating screensavers, firewalls, and virus detection systems,.

• Expertise of employees: The problem exists not only on the expert level, but also on management and user levels. Technology changes with an ever increasing speed, which is partially the reason, but there is also the lack of training on ALL levels. Organizations are just simply not providing sufficient training to their employees.

• Implementation flaws: flaws such as open firewalls, routers with default passwords, deactivated security measures are quite often the result of a lack of awareness or expertise of employees.

• No risk assessment: This could eventually result in spending resources in areas that are less important, and ignoring those that are MORE important.

• Insufficient resources: organizations are constantly in the process of allocating resources; the challenge for many organizations is the proper/correct allocation of resources – many ISMS systems suffer in this area because management fails to conduct an adequate risk assessment.

Protection of human rights and freedoms,

The potential offered by Information Technology may be misused; therefore ways should be sought to protect legitimate interests of all stakeholders involved in the use of Information Technology. However, traditional regulatory and defense mechanisms

that society developed in the past may only hardly be carried over into the digital space. In particular ethics and moral, which are being formed gradually, belong to a private sphere of individuals, or communities at the most, and have no legal force. Good legislation is necessary in order to make sure that detected crimes tending to violate human rights and freedoms are effectively prosecuted. Amidst growing security problems of the digital space (computer crime, organized crime, terrorism),it will be necessary to define a legal framework for the protection of digital

Building awareness and competence in information security

Analyses have shown that many security incidents are caused by insufficient expertise and knowledge of information system administrators, users, as well as information security managers. On that account, the issue of their qualification and education needs to be addressed.

Qualification does not entail only education but, above all, experience and expertise in any given field and. In the light of potential threats, it is necessary to achieve the required level of security awareness i.e.by understanding the need and nature of information security among all its users in order to safeguard the digital space and, subsequently, translate security awareness into a competence.

The following strategy would help to achieve and retain workable level of security awareness and competence if followed:

- Raising awareness using the Internet, mass media and methodology material, among citizens, commercial and non-commercial organizations and public institutions of the risks related to the use of ICT and of means available to protect against threats.
- Strengthen educational activities there by making the information security causes as a basics part of information classes being taught at school and Introduce programmers to enhancing security awareness and competence of ICT users, special requirements for information security.

(See you tube video on office information security 1- http://bit.ly/ZLPznM)

Creation of secure environment,

The role of the state is to create good conditions for co-operation among all involved stakeholders in any office environment it includes, in particular, laying down a legal framework, drafting strategic documents and methodology materials, determining competences, obligations and responsibility. Another important task is to create uniform information security standards and coordinate how they are been issued.

Security Education and training,

Security Awareness Program – office personnel must have the knowledge to understand the significance of their actions. Human interaction may sometimes act in ways that undermine security controls, causing security breaches. Therefore, a Security Awareness Program is chartered to:

• Clarify why security scheme is important and what control measure are needed

• Clarify employee on responsibilities towards achieving the desired

Security level

The Security Awareness program should include "new hire" orientation, and ongoing refresher activities. A critical factor directly affecting the ability to find and implement adequate solutions to security problems is individual's competence in any organization which is closely related to obtaining knowledge. In this respect, the following needs to be analyzed

- Knowledge needs of the ICT user categories (lay users, IT specialists and information security experts).
- Capacity and content of what is been taught in-school and other training types available like lifelong learning, corporate trainings, e-learning, etc.

Based on these analysis, the following can be propose

- Information security (IS) into Information Technology (IT) or other relevant causes introduced at lower levels and improved upon at other higher levels.
- A lifelong learning scheme, mainly the basic and later a follow-up training course for those who would later become specialists in the field of Information Technology (IT).
- To publish and support publishing of specialized literature and methodology documents addressing particular issues of information security.

(See you tube video on office information security 2, 3- http://bit.ly/ZLPznM , http://bit.ly/1vDEyO1)

SELF ASSESSMENT EXERCISE

Enumerate major duties of an Information System Security Officer

Answer to the Self Assessment Exercise

The duties of an Information System Security Officer include:

• Establish and review the Security Risk Assessment
• Record and resolve security incidents
• Lead the Management Security Forum
• Prepare Management Security Forum security briefs
• Lead the Incident Response Team
• Maintain the Statement of Applicability
• Evaluate changes in asset base and resultant security implications
• Consult and advice on general information security issues
• Select controls and risk mitigation

CONCLUSION

Security issues within and around any organization cannot be over emphasized, the unit trued to point common overlooked information security issues, provided points in form of solution and training that could be followed and easily digested.

We are aware that resolution on how information security issues around the office cannot be exulted so it's imperative that we take note of upcoming ideal and look out for related solutions and improvement

SUMMARY

Information security issues was been treated alongside various information technological issues, some common causes pointed out, and how they could be resolved,

6.0 TUTOR-MARKED ASSIGNMENT

a) Let assume you manage an organization or you head the information technology (IT) section of your office and the resources are available to spend on information security, would it be better spent on a firewall and network security technology, or would investing in training personnel bring more effective results?
b) Give reasons for your answers assuming Yes/No.
c) Would you take both steps in (a) above
d) Do you think the steps to attain security in your organization is stressful, expensive and not what it?

UNIT 2: THE FUTURE FOR INFORMATION TECHNOLOGIES.

CONTENT

1.0 INTRODUCTION

This module intends to introduce the present ongoing project as regards the future for information technology in the office environment. As compared to present day technology and how useful these equipment would be when introduced

2.0 OBJECTIVE

At the end of the study from this unit, you should be able to:

- Explain what you have learnt about Autonomic computing,
- Recognize or identify one when you see it regardless of the form its taking.

3.0 MAIN CONTENT

The future for information is the autonomic computers, a world where systems are self-managing

Presently we have systems managed by individual inputs, though they are actually been improved upon in terms of gathering information, speed, processing, simulating etc. The future is where computers would have to think for itself and the ideas is already been employed in the making of autonomic systems

If you think about the biological systems like the human body, they're tremendously complex and very robust. The human body, for example, is constantly making adjustments. Your heart rate and your breathing rate are being controlled. All of these things happen beneath the level of conscious control, so biological systems give us a metaphor for thinking about computer systems. When we take a look at the

attributes of biological systems, we find some attributes in there and we wish our computer systems had, like self-healing, self-configuring, and self-protecting attributes. We can begin to build the attributes that we see in biological systems into complex computer systems.
In the end, it all translates into real customer benefits because these more complex systems are easier to administer and are now known as Autonomic Computing.

Autonomic Computing

Autonomic computing is really about making systems self-managing. This is a term that was coined by Paul Horn of IBM Research two years ago to help direct our attention away from our traditional notions of how we think about computer systems and more towards biological systems.
A biological system is more like the human body which is extremely complex. The human body, for example, constantly makes adjustments like controlling ones breathing rate, these and more usually happen beneath the level of conscious.
Looking at the attributes of biological systems, we can find attributes that we wish our computer systems had, like self-healing, self-configuring, and self-protecting. We can begin to build the attributes that we see in biological systems into complex computer systems. In the end, it translates into real customer benefits because these more complex systems are easier to administer.
The vision of autonomic computing represents an amazing combination of revolution and long term economizing. Indeed the deployment, maintenance, and evolution of enterprise systems often require enormous efforts by extremely valuable staff, whose successes add little visible business value but are however vital and their failures catastrophic for the whole enterprise. Autonomic computing, in its broadest sense, seeks to reduce the need for such heroic efforts and their consequential risks.
The vision for Autonomic systems
The increasing use of information systems to collate, analyze, locate, summarize, and otherwise process information has had an immense impact on modern life. That so much of this change has occurred in back offices makes it easy to underestimate the extent to which the design, construction, and especially maintenance of these systems challenge our capabilities as engineers.
In some minds autonomic computing today remains closely associated with the original IBM initiative, but to the IEEE and other organizations the term broadly describes the application of more highly developed technology to the management of advanced technology. Similar proposed visions are clearly related: organic computing, bio-inspired computing, self-organizing systems, ultra-stable computing, autonomous and adaptive systems, all these could be known as autonomic initiatives.

Enterprise systems are only one member of a class of complicated systems that must function consistently and reliably independent of detailed human involvement. Many management tasks can no longer be manual operators, however skilled: The system itself must take responsibility to adapt its own operation in the face of changing conditions. This need for self-adapting behavior characterizes the domains in which autonomic computing ideas are gaining traction.

To take two examples:

- The main cost for the operator of a data center is power, thus the provisioning of systems to match workloads and service-level obligations becomes a critical business success factor, and no human operator can provide services with sufficient efficiency.
- Applications like environmental sensing causes network to meet the real world in ways that preclude direct human management. The viability of environmental sensing-essential for effective science and policymaking-therefore depends on sensor systems' ability to self-manage in the face of a changing environment.

The most widely recognized elements of autonomic systems are their self-properties: For systems to be self-managing they should be self-configuring, self-healing, self-optimizing, and self-protecting and exhibit self-awareness, self-situation, self-monitoring, and self-adjustment despite their seeming simplicity, these goals mask a complex interaction between the behaviors of systems and their goals, users, and their relationships with the external environment. We can only optimize a system against some external criteria, so self-optimization implies that these criteria are made available in some way to the management system. Moreover, composition and analysis of systems probably imply that the criteria be explicit, symbolic, and machine-readable rather than embedded implicitly into algorithms.

Resolutions made possible by the autonomic computer within the industry

As computing power has increased, we've got the ability to create much larger kinds of applications; this complexity comes at a cost because humans are sitting behind the scenes, making all these machines work together. Our hope is to see autonomic computing behavior in the computer systems, so it becomes less costly for people to build these complex applications; in fact, some people believe that the costs of managing these systems undermine the benefits these systems provide, even if the organization decides to use outside services. To overcome this, academic and industry researchers like IBM have begun working on autonomic computing systems, which are self-managing, meaning they need only minimal human intervention to operate. In other words, in a traditional computing environment, system operators often have to fine-tune the computer's configuration in order to efficiently solve a particular type of complex problem. In an autonomic computing environment, the ultimate goal is to allow the system to do everything else on its own, completely transparent to the user. In order to achieve from any malicious attacks (e.g., by automatically quarantining infected parts of a system) Clearly, these are some

formidable tasks researchers have to address, but considering the time and money that is currently spent on managing and maintaining IT infrastructures, autonomic computing systems are promising for the future. Thus, an autonomic computing system must know itself and be self-configuring, self-optimizing, self-healing, and self-protecting.

In order to optimally perform different tasks, an autonomic system must know itself; meaning, it must know its configuration, capacity, and current status, but it must also know which resources it can draw on.

Secondly, in order to be able to use different resources based on different needs, the system should be self-configuring, i.e. the user does not have to take care of any configuration issues. When we talk about self-configuring we mean issues relating to upgrade issue, although people may actually prefer to exercise some level of control over their personal systems.

Some of the research teams have put out the idea that autonomic computing isn't about making people go away; it's really changing the nature of the partnership between system administrators and the computers. It's putting more of the burden on the computers and less on the system administrators. Meaning the system administrator plays a role but not as much as would be wished for.

Next, as any parts of a system can malfunction, an autonomic system should be self-healing so that any potential problems are detected and the system is reconfigured so as to allow the user to continue performing the tasks, even if parts of the system are not operational.

Finally, as almost any computer system can be the target for an attack, autonomic computing systems must be aware of any potential dangers and must be able to protect them.

A major benefit of an autonomic system to administrators and the users would be:

- For users, if the autonomic systems are successful, it would reduce the number of times you have to call your help desk.
- For administrators, we think it translates into the need to spend less time on small routine double checks on their machines, but if the machines were self-tuning, you would spend lesser times on checkups and more time thinking about interesting issues like how much benefit to the company the section of the infrastructure will produce.

The **difficulty and the risk** of something going wrong in building an autonomic computing system with this high level of complexity in terms of the software and technique been used is really very high. This in present day computing is been handled by a team of IBM researchers whose job is to carry out researches tirelessly to make sure nothing goes wrong to the best of their knowledge. To be able to achieve this goal, I think the key really is standards. An example, the Open grid

services architecture known as the OGSA standard. It's an important method to standardize the way these autonomic elements begin to communicate with each other. Other technical challenges faced by the these **IBM** expert team in autonomic computing system could be pretty daunting in some respects, especially large-scale autonomic systems with tens of thousands or hundreds of thousands of computers or devices that are all somehow working together and self-optimizing to some extent, so perhaps some of the elements are being selfish and are making trade-offs against other elements. There is still a lot of challenge on how to build and test systems for now. It's only essential that baby steps are been taken to achieve these goals at the longer run

There's also a social issue, which in some ways is just as difficult as the technology issues. We really need for these heterogeneous systems-multiple computers from multiple vendors-lots of software from lots of different people to work together. If it's all going to work, you would really need people to buy into the right standards. That's not more of a technical problem than it's a social problem.

4.0 CONCLUSION

The future for information technology is such that it is bright because there will definitely be improvements on heterogeneous computers like the one we have discoursed. This implies that there is room for so much improvement to be done as there would soon be so many gaps between present technology and the future. so it's best to say in the world of information technology, we are in the future to some extent

5.0 SUMMARY

We look at the future of office information technology, the hopes for the future and other plans. This we treated from the angle of an heterogeneous system.

6.0 TUTOR-MARKED ASSIGNMENT

Q1. Why Autonomic systems are called Heterogeneous systems?

Q2. How far do you think they are in realizing this future goal?

Q3. What is the status of autonomic computing systems research in its current realization?

Q4. How has it influenced research thinking?

Q5. What are the recognizable features of an Autonomic computing device?

Q6. When completed do you think these computers would be cost effective with time? Yes/No or both, give reasons for your answer.

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