

# ACCOUNTING AND FINANCE LEVEL – II

Based on November, 2022, Curriculum Version II



**MODULE TITLE: Using Business Technology and Equipment**

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## Acknowledgment

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Ministry of Labor and Skills wish to extend thanks and appreciation to the many representatives of TVT instructors and respective industry experts who donated their time and expertise to the development of this Teaching, Training and Learning Materials (TTLM).

## Acronyms

|              |                                                  |                                                             |                             |
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|         |                                    |
|---------|------------------------------------|
| PCs     | Personal computers                 |
| RAM     | micro-processor and memory         |
| TCP/ IP | Internet protocol suite            |
| WWW     | World Wide Web                     |
| DSL     | Digital Subscriber Line            |
| ADSL    | Asymmetric Digital Subscriber Line |
| SQL     | Structured Query Language          |
| CAE     | Computer Aided Engineering         |
| CAD     | Computer Aided Design              |
| CAM     | Computer Aided Manufacturing       |
| CD -ROM | compact disc read-only memory      |
| LBP     | Diseases of musculoskeletal system |
| COM     | Computer Output Microfilm          |
| OHS     | Occupational health and safety     |

## Introduction to the Module

Today is an interesting time to study business and business technology. Business is a set of interrelated activities carried out with a view to make profit. Therefore, we define business enterprise as the organizational context within which men, ideas, money, materials and machines are combined for the purpose of providing needed goods or services, in order to make a profit. Because of get more profit always organization need to improve its activities. So using technology is very important to bringing changes in the ways we produce and deliver goods and services.

The as the Internet and other improvements in communication now affect the way we do business. Generally technology is very important to enhance business activities. It plays an important role in daily commerce tasks. It can enhance productivity, increase sales and quickly get key operational information to management for important decision making. This technology includes the effective use of computer software to organize information and data about the organization's activities. According to this context the learning module covers the knowledge, skill and attitude relative to **the competence** required to Select and use technology, Process and organize data and maintain a range of business technology.

### **This module covers the units:**

- Select and use technology
- Organize data and Process
- Maintain technology

### **Learning Objective of the Module**

- Appropriately Select and use business technology
- Perform Process and organize data
- Properly Maintain technology

|              |                                                  |                                                             |                             |
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## Module Instruction

For effective use this modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit

## Unit One Select and use technology

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

- Selecting technology and software applications
- Adjusting Workspace based on ergonomic requirements
- Using appropriate technology

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

Specifically, upon completion of this learning guide, you will be able to:

- Identify appropriate technology and software applications
- Carry out Workspace, furniture and equipment ergonomic
- Use Technology according to organizational requirements

## 1.1. Selecting technology and software applications

### 1.1.1. Overview of Business technology

The word business technology is constructed from two words:- **Business** and **Technology** or Business and technology are two different terms; however, technology plays a key role in helping businesses produce results. It is defined as the use of scientific **know-how** for practical functions. The definition of business technology denotes the application of information, science, and profession involving technical designing for business roles, such as attaining organizational and economic goals. In this light, business technology ensures appropriate coordination and organization of technological management within the entire enterprise. There exist various examples of business technology. Software, and hardware technology (computers, mobile).

**Fore example software technology such as:-**

- Microsoft Word,
- financial spreadsheet systems
- Microsoft Excel etc.

**Example of hardware technology such as:-**

Computers  
Mobile  
Printers

### 1.1.1. Business

The term business refers to an enterprising entity that deals with commercial activities. Business ranges in the matter of scale from small to large. It is any activity that provides goods or services to consumers/customers for the purpose of making a profit. There are many types of businesses in the world that provide goods and services to customers in order to make profit. And the businesses industries need to improve their activities by using appropriate technology. Because all businesses industries hope to sell their products or services to customers for more than it cost to make a profit. Technology can enhance productivity, increase sales and quickly get key operational information to management for important decision making. Commercial organization like companies or other organizations that:-

- Buys and sells goods (merchandize business)
- Makes products ( manufacturing business)

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- Provides services (services business) are using appropriate technology according to their business types to compute their competitors. Especially the smart use of technology helps small companies stay ahead of the competition by improving communications, making employees more efficient and tapping into effective marketing channels. Most businesses understand that they need to challenge not only their competitors but also themselves in order to constantly improve their customers' view and their ability to meet market demand.

### Activity .1.1.

1. How many businesses in industries sector you with familiar around in your environment? List at least five business names what you know.
2. Did you think to create your own business? If not, Why identify now your business
3. Which technology is favorable for your business? What equipment you will need to do your business?
4. Think about some simple tools you use every day. Is it technology?
5. Did you identify the types of industry and business? What industry you like? Why?

### Types of Industry

- Agriculture & Forestry/Wildlife
- Business & Information
- Construction/Utilities/Contracting
- Education
- Finance & Insurance
- Food & Hospitality
- Health Services
- Natural Resources/Environmental
- Transportation etc.

### Classification of industry sectors and business organization under sectors

| Industry sectors | Business type                  | Industry sectors         | Business type     |
|------------------|--------------------------------|--------------------------|-------------------|
| <b>Education</b> | Child Care Service             | <b>Other (Education)</b> | Private School    |
|                  | College/Universities           |                          | Technical School  |
|                  | Elementary/Secondary Education |                          | Tutoring Services |
|                  |                                |                          | Vocational School |

### Classification of industry sectors and business organization under sectors

----Continuous---

| <u>Industry sectors</u>        | Business type                       | <u>Industry sectors</u>                | Business type                            |
|--------------------------------|-------------------------------------|----------------------------------------|------------------------------------------|
| <b>Finance &amp; Insurance</b> | <b>Accountant</b>                   | <b>Agriculture/ Forestry/ Wildlife</b> | Farming(Animal Production)               |
|                                | Auditing                            |                                        | Farming(Crop Production)                 |
|                                | Bank, Credit Union and Insurance    |                                        | Landscape Services                       |
|                                | Bookkeeping                         | <b>Business &amp; Information</b>      | Consultant                               |
| <b>Construction</b>            | Cash Advances and Collection Agency |                                        | Employment Office                        |
|                                |                                     |                                        | Marketing/Advertising                    |
|                                |                                     |                                        | Online Business                          |
|                                |                                     |                                        | Publishing Services and Video Production |
|                                |                                     |                                        |                                          |
| <b>Construction</b>            | Architect(designer)                 | <b>Health Services</b>                 | Athletic Trainer                         |
|                                | Building Construction               |                                        | Emergency Medical Services               |
|                                | Building Inspection                 |                                        | Emergency Medical                        |
|                                | Concrete Manufacturing              |                                        | Transportation                           |

|                      |                      |
|----------------------|----------------------|
| Contractor           | Home Health Services |
| Engineering/Drafting | Hospital             |
| Equipment Rental     | Massage Therapy      |
|                      | Medical Office       |

### Classification of industry sectors and business organization under subsector

#### ----Continuous---

| <u>Industry sectors</u>                              | <u>Business type</u>   | <u>Industry sectors</u> | <u>Business type</u> |
|------------------------------------------------------|------------------------|-------------------------|----------------------|
| Food & Hospitality<br><br>Other (Food & Hospitality) | Alcohol Sales          | Other(Health Services)  | Pharmacy             |
|                                                      | Alcoholic /Hotels      |                         | Physical Therapy     |
|                                                      | Food/Beverage          |                         | Physician's Office   |
|                                                      | Manufacturing)         |                         | Radiology            |
|                                                      | Bakery Manufacturing   |                         | Veterinary Medicine  |
|                                                      | Restaurant/Bar         |                         | Wholesale            |
|                                                      | Specialty              |                         | Drug Distribution    |
|                                                      | Food(Fruit/Vegetables) |                         |                      |
|                                                      | Specialty Food(Meat)   |                         |                      |
|                                                      |                        |                         |                      |

### Activity 1.2.

1. Write a paragraph about industry sector and business in a sector. Discuss with your trainer

#### 1.1.2. Technology

Technology is the practical use of human knowledge to extend human abilities and to satisfy customers' needs and wants. It is the application of scientific knowledge for practical purposes or applications. Technology can also use scientific principles to advance industry.

There are many different types of technology, differing in historical invention and application, as well as by the type of problem they solve.

### **Types of technology as general:-**

- mechanical technology,
- medical technology
- communications technology,
- electronic technology
- industrial technology and
- Transportation technology
- Manufacturing technologies. Though these different types of technology all serve different purposes, range in design, and are applied in different ways, they all have one thing in common: they all solve a problem.

### **1.1.2. Select Technology**

#### **Common Types of business Technology**

There are various types of technology on the world; however, some are more commonly used than others. Example of business technology:-

- Computers (Desktop, Laptop)
- Digital cameras
- Modems
- Routers
- Scanners
- Photocopiers
- Audio recorders etc.

## A. Computers

A computer is an electronic device for storing and processing information. A personal computer has a separate hard drive and monitor that are attached to other equipment such as a keyboard and mouse. Personal computers are used in all organizations to carry out many different tasks. Organizational data is usually processed using a computer and different software applications. Today, Computers are used across multiple businesses. They're equipped with software that enables them to perform all sorts of tasks such as analyzing financial information, sending and receiving emails and designing sales presentations. The computer is made as a desktop apparatus or a mobile laptop for either office or traveling purposes.

### Four types of personal computers include:

- Desktops
- Laptops
- Tablets
- Mobile devices also known as handhelds:- Smartphones most widely used handheld computer

### Desktop Computers and Laptops

For most companies, the most useful piece of equipment is also the most understood. Desktop computers loaded with office and productivity software packages allow workers to write letters, analyze financial information, send and receive emails, and design sales presentations. The computer itself could be a desktop model with a separate monitor and keyboard, or a mobile laptop. So personal computers (PCs) operate using Microsoft Windows are the most common. A **laptop** is a small, portable computer that has its hard drive, screen and keyboard within the same piece of equipment. Laptops are popular as they are portable, lightweight and don't solely rely on a plug-in power supply (they have rechargeable batteries).

## Personal computer hardware

- **System unit** :- micro-processor and memory (RAM)
- **Input devices**:- keyboard and mouse
- **Output devices**:- most common is computer display, or monitor
- **Secondary storage**:- hard disks, solid-state storage, and optical disks
- **Hard disks**:- store programs and very large data files
- **Communication devices**:- modems

## B. Software Types

**System software** is responsible for controlling, integrating, and managing the individual hardware components of a computer system so that other software and the users of the system see it as a functional unit without having to be concerned with the low-level details such as transferring data from memory to disk, or rendering text onto a display. Generally, system software consists of an operating system and some fundamental utilities such as disk formatters, file managers, display managers, text editors, user authentication (login) and management tools, and networking and device control software.

**Application software** is used to accomplish specific tasks other than just running the computer system. Application software may consist of a single program, such as an image viewer; a small collection of programs (often called a software package) that work closely together to accomplish a task, such as a spreadsheet or text processing system; a larger collection (often called a software suite) of related but independent programs and packages that have a common user interface or shared data format, such as Microsoft Office, which consists of closely integrated word processor, spreadsheet, database, etc.; or a software system, such as a database management system, which is a collection of fundamental programs that may provide some service to a variety of other independent applications.

### Three type of application software

- **General purpose application software** that is used in nearly all careers (ex: browser, word processor, spreadsheet, data base management system, presentation graphics)
- **Specialized computer programs** that are narrowly focused on specific disciplines and occupations (ex: graphics and Web authoring programs.)
- **Mobile apps or mobile applications**, or **simply apps**, are small programs designed for mobile devices such as smartphones and tablet computers. The most popular mobile apps are for social networking, playing games, and downloading music and videos.

### Comparison Application Software and System Software

|              | System Software                                                                                                                                                                                                                                                  | Application Software                                                                                                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              | <b>Computer software</b> , or just software is a general term primarily used for digitally stored data such as computer programs and other kinds of information read and written by computers. App comes under computer software though it has a wide scope now. | <b>Application software</b> , also known as an application or an " <b>app</b> ", is computer software designed to help the user to perform specific tasks.                                                                              |
| Example:     | 1) <b>Microsoft Windows</b><br>2) <b>Linux</b><br>3) <b>Unix</b><br>4) <b>Mac OSX</b><br>5) <b>DOS</b>                                                                                                                                                           | 1) Opera (Web Browser)<br>2) Microsoft Word (Word Processing)<br>3) Microsoft Excel (Spreadsheet software)<br>4) MySQL (Database Software)<br>5) Microsoft PowerPoint (Presentation Software)<br>6) Adobe Photoshop (Graphics Software) |
| Interaction: | Generally, users do not interact with system software as it works in the background.                                                                                                                                                                             | Users always interact with application software while doing different activities.                                                                                                                                                       |
| Dependency:  | System software can run independently of the application software.                                                                                                                                                                                               | Application software cannot run without the presence of the system software.                                                                                                                                                            |

## Productivity tools, such as

- Microsoft Word,
- word processing package
- Microsoft Excel
- a financial spreadsheet system, can perform many of the most common tasks a small business requires.
- Microsoft PowerPoint allows users to prepare professional-looking sales presentations quickly and easily.
- **Word processing software**

Word processing software allows the user to create, store and print written documents. You can type, edit and insert graphics to create documents that you can easily print and save. The most commonly used word processing software is Microsoft Word.

- **Spreadsheets and accounting software**

In accounting, a spreadsheet is a large sheet of paper that displays the financial transactions of a company. Spreadsheet software records and processes accounting transactions within areas such as: - accounts payable, accounts receivable and payroll. It spreads, or shows, all the information, such as costs, income, taxes, on a single sheet and organizes information into columns and rows. The data can then be manipulated by a formula to give a total or sum. A spreadsheet presents a lot of information in an easy-to-read format. It helps the decision makers see the financial ‘big picture’ of an organization. The most commonly used spreadsheet software is Microsoft Excel

## C. Internet

|               |                                                  |                                                             |                             |
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The internet is the largest computer network in the world, connecting millions of computers. A network is a group of two or more computer systems linked together. The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (**TCP/IP**) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries a vast range of information resources and services, such as the interlinked hypertext documents of the World Wide **Web (WWW)** and the infrastructure to support electronic mail.

### Uses of Internet

Internet has been the most useful technology of the modern times which helps us not only in our daily lives, but also our personal and professional lives developments. The internet helps us achieve this in several different ways. For the students and educational purposes the internet is widely used to gather information so as to do the research or add to the knowledge of various subjects. Even the business professionals and the professionals like doctors, access the internet to filter the necessary information for their use. The internet has served to be more useful in maintaining contacts with friends and relatives who live abroad permanently.

### Advantages of Internet:

- **E-mail:** Email is now an essential communication tools in business. With e-mail you can send and receive instant electronic messages, which works like writing letters. Your messages are delivered instantly to people anywhere in the world, unlike traditional mail that takes a lot of time. Email is free, fast and very cheap when compared to telephone, fax and postal services.
- **24 hours a day - 7 days a week:** Internet is available, 24x7 days for usage.
- **Information:** Information is probably the biggest advantage internet is offering. There is a huge amount of information available on the internet for just about every subject, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support. You can almost find any type of data on almost any kind of subject that you are looking for by using search engines like **Google, yahoo, msn**, etc.

- **Online Chat:** You can access many ‘chat rooms’ on the web that can be used to meet new people, make new friends, as well as to stay in touch with old friends.
- **Services:** Many services are provided on the internet like **net banking**, job searching, purchasing tickets, hotel reservations, guidance services on array of topics engulfing every aspect of life.
- **Communities:** Communities of all types have sprung up on the internet. Its a great way to meet up with people of similar interest and discuss common issues.
- **E-commerce:** Along with getting information on the Internet, you can also shop online. There are many online stores and sites that can be used to look for products as well as buy them using your credit card. You do not need to leave your house and can do all your shopping from the convenience of your home. It has got a real amazing and wide range of products from household needs, electronics to entertainment.
- **Entertainment:** Internet provides facility to access wide range of Audio/Video songs, plays films. Many of which can be downloaded. One such popular website is YouTube.
- **Software Downloads:** You can freely download innumerable, software’s like utilities, games, music, videos, movies, etc from the Internet.

### Limitations of Internet

**Theft of Personal information:** Electronic messages sent over the Internet can be easily snooped and tracked, revealing who is talking to whom and what they are talking about. If you use the Internet, your personal information such as your name, address, credit card, bank details and other information can be accessed by unauthorized persons. If you use a credit card or internet banking for online shopping, then your details can also be ‘stolen’.

**Negative effects on family communication:** It is generally observed that due to more time spent on Internet, there is a decrease in communication and feeling of togetherness among the family members.

**Virus threat:** Today, not only are humans getting viruses, but computers are also. Computers are mainly getting these viruses from the Internet. Virus is is a program which disrupts the

normal functioning of your computer systems. Computers attached to internet are more prone to virus attacks and they can end up into crashing your whole hard disk.

## **Internet hardware**

### **a. Modem**

The primary piece of hardware you need is a modem. The type of internet access you choose will determine what type of modem you need. Dial-up access uses a telephone modem, **DSL** service uses a DSL modem, **cable** access uses a cable modem, and satellite service uses a satellite adapter. It is communication device. The word ‘modem’ stands for modulator/demodulator. A modem converts digital signals from a computer into analogue sound signals that can be sent over a telephone line. It is a device that lets a computer talk to another computer over a telephone line; that is, it connects you to the internet. In the workplace, a modem is connected to a server and personal computers are connected to the server with a network cable.

**Digital Subscriber Line (DSL)** is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for digital subscriber loop. In telecommunications marketing, the term DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed DSL technology. DSL service is delivered simultaneously with wired telephone service on the same telephone line. This is possible because DSL uses higher frequency bands for data separated by filtering. On the customer premises, a DSL filter on each outlet removes the high frequency interference, to enable simultaneous use of the telephone and data.



DSL Modem

|               |                                                  |                                                             |                             |
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**Figure 1-1.1-1 DSL Modem**

## **b. Router**

A router is a hardware device that allows you to connect several computers and other devices to a single internet connection, which is known as a home network. Many routers are wireless, allowing you to easily create a wireless network.



Wireless router

**Figure 1-1.1-2 Wireless router**

## **D. Copy machine**

A photocopier is a machine that makes copies of documents and other visual images onto paper or plastic film quickly and cheaply.



**Figure 1-1.1-3 photocopy**

## E. Scanners

Scanners convert hard copy (paper) information into digital (electronic) information, which you can send electronically via email. An image of handwriting, or map on paper, converted into an electronic image, can be inserted into the document you are working on. It can also be resized or cropped if you only want a part of the image. This can also be done using a digital photo instead of a scanned image. In most offices, scanners are incorporated into a photocopier.



**Figure 1-1.1-4 scanner**

## F. Printer

Printers are Output devices used to prepare permanent Output devices on paper. A printer produces a paper copy of information generated by a computer.

### Types of printer

May be when you hear the word printer, you may think of laser and ink-jet printers. But there are many more categories. If you are looking to buy a new printer, this list will help you learn the different types and make an educated decision about which type is right for you / your business. Read the article below to learn more.

|               |                                                  |                                                             |                             |
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#### a. Inkjet Printers

The first and standard type is the inkjet printer. Although a bit outdated, they are still widely used because they are reasonably priced. Their biggest advantage is that they can blend different colors smoothly. Though laser printers are faster, inkjet printers offer the best photo and image quality.

Another reason to opt for an inkjet printer is versatility. Unlike other types of printers, inkjet can print on a wide variety of media. For example, you can print on a specially designed canvas. Plus, you can print on different formats of paper, from banner-size to everything else.



Figure 1-1.1-5 inkjet Printer

#### Advantages Inkjet Printers :

- Capable of producing highly detailed and photo-realistic prints
- Limited warm-up time required
- Small footprint

#### Disadvantages:

- ❖ Higher cost-per-page than most laser printers
- ❖ Wet prints
- ❖ Can be less reliable than laser printers

## b. Laser Printers

For office or business use, you will want speed, and the laser printer delivers just that. It also offers better text quality over inkjet printers, which is essential for office use.



Figure 1-1.1-6 laser Printer

Usually, the use of laser printers is for printing in large quantities, so the price per page is cheaper than inkjet printers. Laser printers are still widely used in large offices as they are traditionally more efficient than inkjet printers.

### Advantages:

- More cost effective than inkjet printers
- Increases productivity
- High print speed
- Higher paper capacity
- Often expandable with Paper Trays, finishers etc.
- Grows with your business

### Disadvantages:

|               |                                                  |                                                             |                             |
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- May require short ‘warm-up times’
- Larger footprint
- High voltage usage leads to small carbon emissions

**c. LED Printers**

Very similar to laser printers, LED printers still use toner and a rotating drum. They are different only in the source of light. They source light from an LED array.



Figure 1-1.1-7 LED Printer

This means they work in different ways.

LED printers are similar to laser printers but use a light emitting diode rather than a laser to create images on the print drum or belt. Due to their fewer moving parts – LED printers are often considered more efficient and reliable than laser printers. Our most popular LED printers are produced by OKI.

**Advantages:**

- Reliable and efficient
- Cheaper to manufacture than laser printers
- Often include free warranty extensions

**Disadvantages:** None

#### d. Snapshot Printers

With a rise in the use of digital photos and graphics, we've seen a demand for specifically designed printers. That is how the snapshot printer came about. This is the best type of printer for image and photo printing. The Snapshot printer is great for families that have a lot of photos to share, or for companies printing posters.



Figure 1-1.1-8 Snapshot Printers

Photo printers can function without a PC connection.

#### e. Multifunctional Printers

Last but not least, there is the multifunctional printer. This printer can be classified as a subcategory. Inkjet and laser printers can both be multifunctional.



Figure 1-1.1-9 Multifunctional Printers

Multifunctional lasers are designed for people who need more than just a printer. They can also scan images, eliminating the need for a scanner. Because they offer more functions, they are also bigger in size. Sometimes known as all-in-one printers, multifunction printers are often capable of performing printing, copying, scanning, and faxing tasks. This can simplify the completion of multiple tasks within an office or domestic environment, with no need for more than one unit

**Advantages:**

- a. More cost efficient than buying multiple devices
- b. More compact than buying multiple devices
- c. Perform numerous tasks simultaneously
- d. More power efficient than the implementation of numerous devices

**Disadvantages:**

- a. Can restrict usage time available for larger workgroups.

## G. Plotter

- Plotters are used to print graphical output on paper.
- It interprets computer commands and makes line drawings on paper using multicolored automated pens. It is capable of producing graphs, drawings, charts, maps etc.
- Computer Aided Engineering (CAE) **applications** like CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) are typical usage areas for plotters.



Figure 1-1.1-10 plotter

## Business technology equipment



**Figure 1.1-11 business equipment**

### **Binding equipment**

There are lots of different ways you can join paper to make a book. A quick and easy method is to use staples, paper clips or fold-away clips.

### **Heat binder**

An electric heat-binding machine uses heat to bind a document between specially glued covers.

### **paper drilling machines**

Using a small manual hole puncher, holes can be punched down the side of a document so it can be placed in a ring binder.

## Comb binder

A comb binder uses plastic or wire combs to join pages together. A plastic cover is often used for the front, and a thick card for the back.

## Cutter

Cutter is used to trim the edges of a document before binding it or to cut pages to a particular size

## Networking of Computers and Printers

Computers are often linked to form a network. This can allow people within an organization to share documents or information, provide a central repository to store documents, or for people to communicate using email within an office. They also allow several computers to share a printer or storage device. A network can be limited to computers within a shared office, or span across multiple offices and locations.

## Technology equipment

- computers
- printers
- photocopiers
- faxes
- Telephones.
- Microphone
- Scanner
- Webcam
- .Graphics
- Tablets
- Touchpads
- Cameras
- Video Capture

### Technology consumables

Replace technology consumables, including:

- printer ribbons and cartridges
- **CD-ROMs**
- **floppy disks**
- **toner cartridges**
- **back-up tapes**
- **Zip disks**

## 1.2. Workplace Ergonomics

### Definition of ergonomics

**Ergonomics** (Greek: Ergon = work + Nomos = custom, law) is an interdisciplinary scientific approach to problems of adjusting work to humans, aiming to increase productivity, i.e. working efficiency, work safety, and humanization of human labor.

**Ergon** – work

**Nomos** – laws of

**Ergonomics** is the laws of work that define the limits to human capability.

Ergonomics is the science of improving employee performance and well-being in relation to the

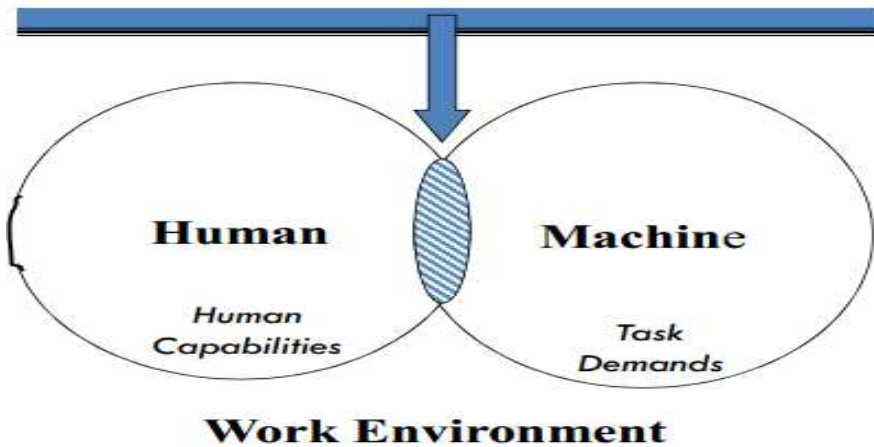
- Job tasks,
- Equipment, and
- The environment.

### 1.2.1. The Focus of Ergonomics

The focus is on the interaction between the person and the machine and the design of the interface between the two.

- Improved machine performance that increased the psychological or physical stress on workers or damaged the local environment would not constitute improved performance of the total work system or better attainment of its goals.
- When faced with **productivity** problems, engineers might call for better machines, personnel management might call for better trained people
- Ergonomists call for a better interface and better interaction between the user and the machine – better task design.

# Ergonomic



## The clear definition of Ergonomic

**Ergonomics** is a means of improving working conditions and reducing illness at work

- **Ergonomics attempts** to ‘Fit the Job to the Man’ rather than ‘Fit the Man to the Job’
- **Ergonomics** is concerned with the design of systems in which people carry out work
- **Ergonomics optimizes** Efficiency, Health, Safety and Comfort of people through better designs of products and work places.

## Components of a Comfortable Workstation

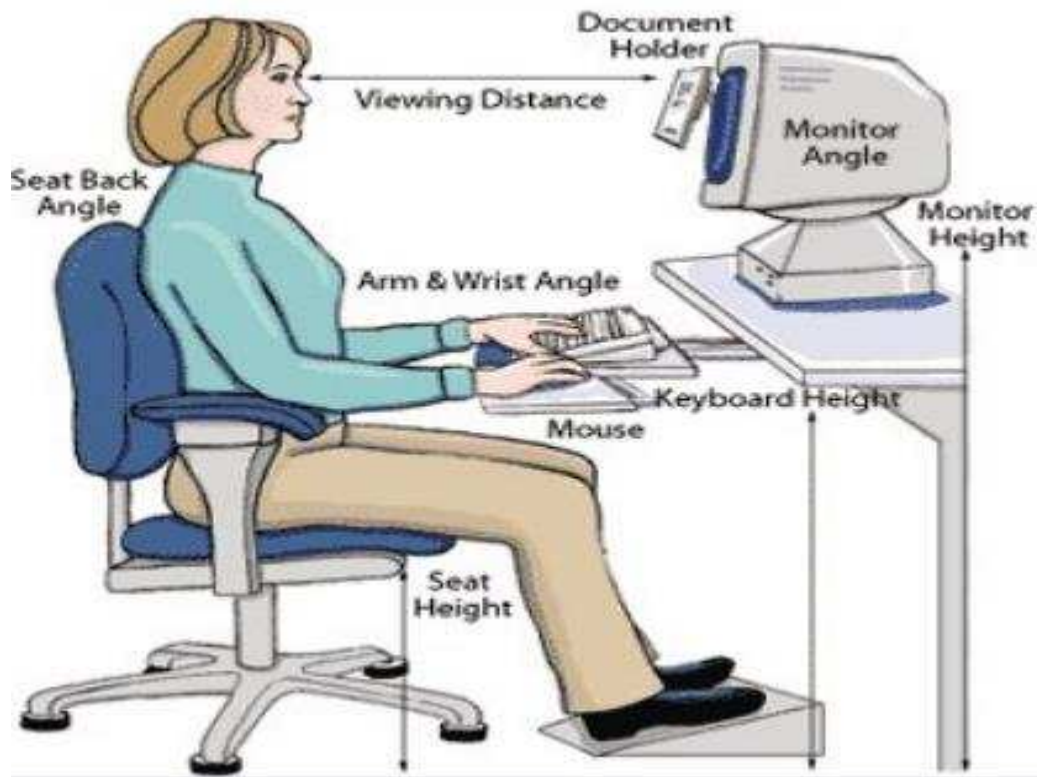


Figure 1.2 computer ergonomic

### Domains of Ergonomics

**Physical** (repetitive movements, layout, health, safety)

**Cognitive** (mental workload, decision making, and work stress)

**Organizational** (communication, teamwork, work design, and telework)

### 1.2.2. Importance of Ergonomics

#### A. Economic Value

1. Reduction of costs by preventing work related problems
2. Health care costs for treatment
3. Costs associated with loss of labor
4. Companies can improve efficiency, worker productivity and cost reduction

5. Ergonomically designed products deliver benefits to customers and edge out competition Special situations – short vs. tall, overweight, handicapped, elderly, pregnant women

#### **B. Social Value**

- Human wellbeing, safety, health and comfort
- Reduces accidents at work, at home, etc. by reducing human error
- Improves relationship between operators and equipment
- Decreases absence from work
- Diseases of musculoskeletal system (LBP)
- Psychological illnesses (stress)
- User friendly products

### **1.2.3. Benefits of ergonomics**

- Productivity
- Product quality
- Safety
- Health
- Reliability
- Job satisfaction
- Personal development

### **1.2.4. Methods Analysis**

- A. Analyzing how a job gets done
- B. It begins with an analysis of the overall operation
- C. It then moves from general to specific details of the job concentrating on
- D. Workplace arrangement
- E. Movement of workers and/or materials

|               |                                                  |                                                             |                             |
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## **The need for methods analysis can arise from a variety of sources**

- Changes in tools and equipment
- Changes in product design or introduction of new products
- Changes in materials and procedures
- Government regulations or contractual agreements
- Accidents or quality problems

## **Methods Analysis Procedure**

- Identify the operation to be studied, and gather relevant data
- Discuss the job with the operator and supervisor to get their input
- Study and document the present methods
- Analyze the job
- Install the new methods
- Follow up implementation to assure improvements have been achieved

## **Guidelines for Selecting a Job to Study**

### **Consider jobs that:**

- Have a high labor content
- Are done frequently
- Are unsafe, tiring, unpleasant, and/or noisy
- Are designated as problems
- Quality problems
- Processing bottlenecks etc.

### 1.2.5. Workplaces arrangement

#### Office Ergonomics

- Positioning of the Chair
- Keyboard and Input Device Arrangement
- Work Surface and General Housekeeping
- Environmental Concerns
- Work Conditioning

#### Office Ergonomics – Chair

Perhaps you find your chair is not particularly comfortable and seems to become less so each time you plop down upon it. This guide is designed to help you identify chair features that will make your seated work more comfortable and productive



**Figure 1.2-2 office furniture ergonomic**



- Sit back in your seat so that your back is fully supported. Keep your seat back in a locked position instead of allowing it to rock back and forth freely. If you choose to have your chair in the rock position, you can increase the seat back tension for better support.
- Adjust seat back lumbar support so it fits the natural curve in the small of your back.
- For desktop keyboarding: Lower arm rests if they don't allow you to sit with your stomach all the way up to your desk.
- For keyboard tray use: Adjust arm rest height to support forearms without causing shoulder shrugging, slouching or elbow winging (to the side).



**Figure 1.2-3 sitting procedure**

## STEP 2 - ADJUST KEYBOARD

- While seated, sit with arms relaxed by side and bend elbows so hands are just below elbow height. If hands are two (2) to four (4) inches below desk, you may elect to rest forearms on desktop with computer equipment pushed back. You may also use a keyboard tray. (If hands are above the desk, you may need desk to be raised.)
- If you choose a keyboard tray, adjust height of keyboard tray so that forearm is in line with keyboard. Objective is to keep wrists straight. You may need to tilt keyboard tray to achieve straight wrists. Most commonly, the back (far) edge of keyboard tray should be tilted downward.

### STEP 3 - MOUSE

- Place mouse at keyboard level. Wrists should not be bent up, down or sideways.

### STEP 4 - MONITOR

- Place monitor directly centered in front of you. If you have two (2) monitors that are used equally, center them and put them at an angle slightly inward towards each other.
- Adjust height of monitor so that if you drew a straight line horizontally from eyes to monitor, your gaze would hit two (2) to three (3) inches below top of monitor. (If you wear bifocals, the monitor needs to be much lower.)
- Monitor should be about an arm's length away (plus or minus an additional hand length).

### Activity

1. With your chair adjusted properly, is your keyboard and mouse approximately at elbow height?
2. Are your arms in near your trunk rather than stretched out in front of you?
3. Is there at least an inch of clearance between the bottom of your work surface and the top of your thighs?



Figure 1.2-4 adjusted workplace ergonomics

### Office Ergonomics – Environment

- A. Correct amount of color and contrast of light
- B. Reduce (optimally eliminate) glare
- C. Task lighting (e.g., desk lamp, monitor light)
- D. Blink often to keep eyes moist
- E. Adjust gaze every 15 minutes by focusing on object at least 20 ft away

F. Relax eyes before they become fatigued

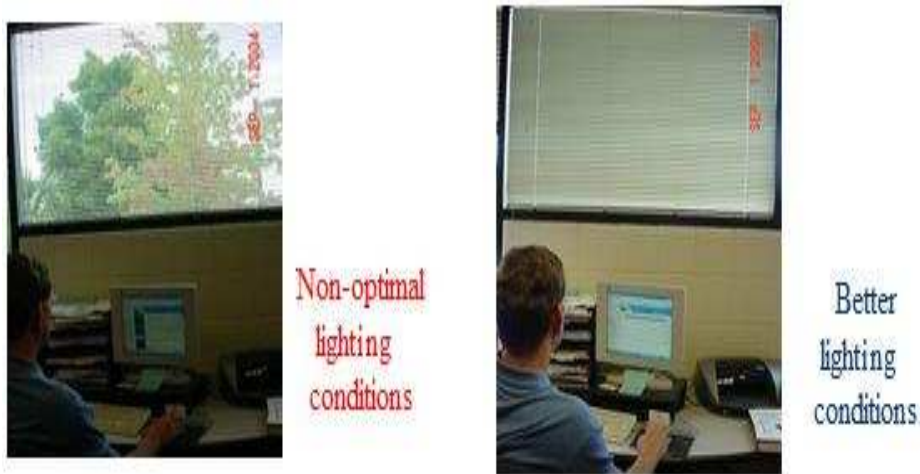


Figure 1.2-5 adjusted work condition/environment

#### Hazards associated with lighting:

- **Glare:** a computer screen positioned in front of a bright window is difficult to see
- **Flickering lights:** a fluorescent globe might malfunction, causing irritation and nausea
- **Inadequate or dim light:** reading in dim light causes eyestrain
- **Reflections:** sunlight reflecting on a screen makes it very difficult to read
- **Shadows:** shadows shifting across your work area may cause you to sit with bad posture when reading.

### 1.2.6. Ergonomics risk

Occur when the type of work you do, your body position and/or your working conditions put a strain on your body. They are difficult to identify because you don't immediately recognize the harm they are doing to your health. Examples include: poor lighting, improperly adjusted workstations and chairs, frequent lifting, repetitive or awkward movements.

#### Repetitive Stress Injury

What are the risk factors?

- a.
- b.
- c.
- d.
- e.

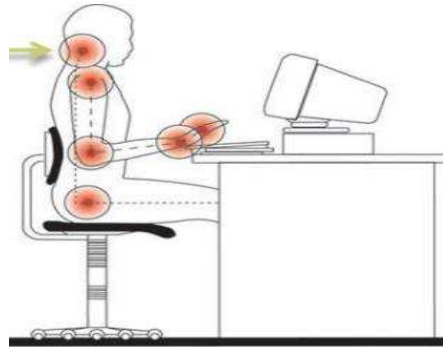


Figure 1.2-6 ergonomics risk

Generally:

- Pain indicates damage to muscles, tendons, or ligaments
- Numbness, tingling and loss of strength and/or coordination may indicate nerve damage
- Cold hands may indicate nerve and/or circulatory problems

**Five main categories Ergonomics risk:**

#### A. Muscle

- May occur from chronic overuse or use of muscle groups not frequently used
- With rest symptoms resolve in a day or two

#### B. Tendon

- With overuse the tendon and sheath may become damaged and not operate properly-wont "glide" as smoothly

#### C. Ligament

|               |                                                  |                                                             |                             |
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- Connect bone to bone-such as vertebrae- and can be damaged if improper lifting technique is used or other back problems occur.

#### D. Circulatory

- Can be impaired by vibration, repetitive motion, awkward postures, low temperatures, etc.

#### E. Nerve

- Often occurs due to compression such as elbows resting on hard surfaces or sleeping on your arms



**KEEP YOURSELF FROM BAD**

**Figure 1.2-7 ergonomics risk**



**Directions:** Answer all the questions listed below.

1. Clearly define business technology
2. List out at least three examples of business technology
3. What is the meaning of ergonomic?
4. Mention the procedures of workplace Ergonomics
5. List types of printer with their advantages

## Unit Two organize data and Process

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

- Identifying opening files and records and processes data
- Operating input devices
- Storing data
- Using manuals, training booklets and online help

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

Specifically, upon completion of this learning guide, you will be able to:

- Generate open files , records and amend tasks
- Operate Input devices
- Appropriately store data and exit applications without damage to or loss of data
- Use manuals, training booklets and/or online help

## 2.1. Identifying opening files and records and processes data

### 2.1.1. Using Computer

A computer is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use.

#### Opening files and records

A file refers to the physical unit of information contained within a paper or electronic folder. Files are created and included in a filing system to provide formal evidence of the business transactions of an organization. Their purpose is to capture, maintain and provide access to evidence of transactions over time in accordance with accountability and business practices. The establishment of a coherent filing system provides for faster and systematic filing, faster retrieval of information, greater protection of information, and increased administrative stability, continuity and efficiency.

Records are held in files to enhance accessibility and identification. Records creation results directly from the transaction of business. In most cases the way in which people and organizations do business results naturally in the creation of records; in other cases a record must be deliberately created because conducting the transaction, by itself, does not generate the record. Records that will meet accountability requirements and other needs of an organization cannot be created or managed without an adequate record keeping system.

#### Four types of files include:

**Document files** – created by word processors

**Worksheet files** – created by electronic spreadsheets

**Database files** – created by database management systems

**Presentation files** - created by presentation graphics applications

**Classification systems** are established so that records will be filed or stored according to a document set of rules. Records need to be retrievable when needed. Determining the type of filing arrangement appropriate for an organization depends on how records will be utilized.

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**Needs analysis:** a needs analysis should be conducted to help determine an appropriate classification system.

**Types of filing arrangements:** the type of filing arrangement depends on the needs of the organization. Alphabetic, Numeric, Alphanumeric, Subject and Geographic, **Standardization:** a consistent system is key to an effective records management program.

**Identification aids and supplies:** these consist of folders, folder tabs, file guides, and color coding. Miscellaneous folders house the group of records that have not been assigned individual file folders.

A computer file is a piece of arbitrary information, or resource for storing information, that is available to a computer program and is usually based on some kind of durable storage. A file is durable in the sense that it remains available for programs to use after the current program has finished. Computer files can be considered as the modern counterpart of the files of printed documents that traditionally existed in offices and libraries.

## 2.1.2. Operating input devices

**Input Devices:** - is any peripheral (piece of computer hardware equipment to provide data and control signals to an information processing system such as a computer or other information appliance. Input device Translate data from form that humans understand to one that the computer can work with. Most common are keyboard and mouse.

### Example of Input Devices:

- Mouse (pointing device)
- Keyboard
- Microphone
- Touch screen\
- Scanner
- Webcam
- .Graphics
- Tablets
- Touchpads
- Camera
- Video Capture
- Hardware.
- Microphone
- Barcode
- reader
- Digital camera
- Gamepad
- Electronic Whiteboard



Figure 2-2.1-1 manual input devices

### 2.1.3. Output devices

Output devices an output device is any piece of computer hardware equipment used to communicate the results of data processing carried out by an information processing system (such as a computer) which converts the electronically generated information into human readable form.

#### Example on Output Devices

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

Mor  
LC  
Prin  
Con  
Plot  
Spe  
Proj

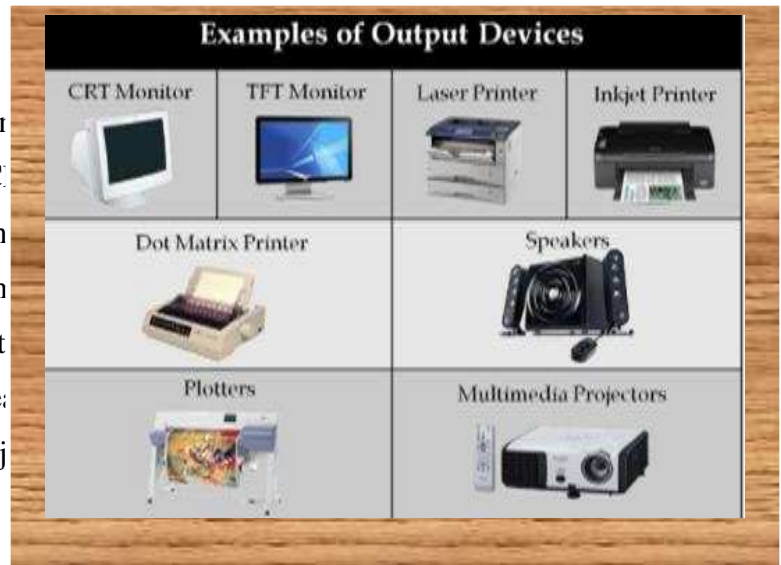


Figure 2-2.1-2 output devices

#### The input and output devices flow chart

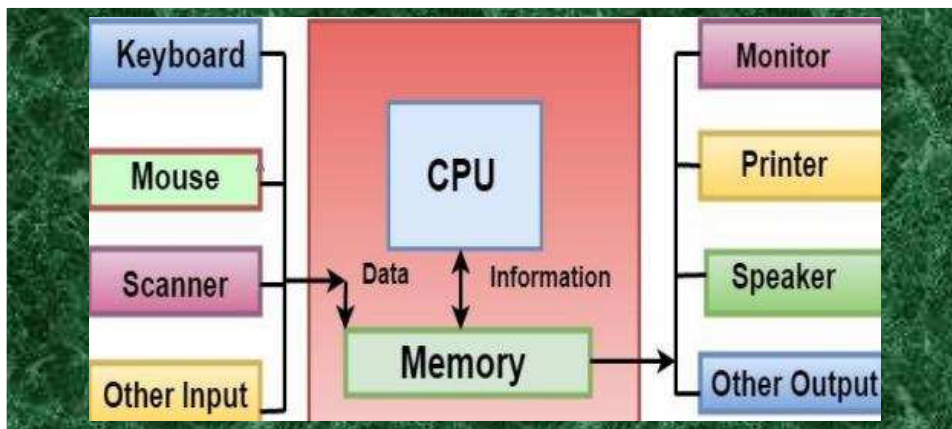


Figure 2-2.1-3 input and output flowchart

#### 2.1.4. Storing data

- **Computer based storage- (Open file)**

##### **Data Storage Elements**

**Entity** – person, place or thing that data is stored about.

e.g. **entity** - The item about which information is stored in a record. Examples include an employee, an inventory item, and a customer.

**Attributes** – facts about entity.

e.g. **attributes** - The properties, identifying numbers, and characteristics of interest of an entity that is stored in a database. Examples are employee number, pay rate, name, and address.

**Fields** – where attributes are stored.

e.g. **field** - The portion of a data record where the data value for a particular attribute is stored.

For example, in a spreadsheet each row might represent a customer and each column is an attribute of the customer. Each cell in a spreadsheet is a **field**

**Records** – group of related attributes about an entity. E.g. A set of fields whose data values describe specific attributes of an entity, such as all payroll data relating to a single employee. An example is a row in a spreadsheet.

**File** – group of related records. E.g. **file** - A set of logically related records, such as the payroll records of all employees.

**Data value** - The actual value stored in a field. It describes a particular attribute of an entity. For example, the customer name field would contain “wxz Company” if that company was a customer.

**Master file** - A permanent file of records that stores cumulative data about an organization. As transactions take place, individual records within a master file are updated to keep them current. For example, individual customer accounts balances are updated to reflect new sales transactions and payments received. Periodically, new records are added to or removed from a master file, for example, when a new customer is added or a former customer deleted.

**Transaction file** - A file that contains the individual business transactions that occur during a specific fiscal period. Transaction files are not permanent and may not be needed beyond the

current fiscal period. However, they are usually maintained for a specified period for backup purposes.

**Database** - A set of interrelated, centrally controlled data files that are stored with as little data redundancy as possible. A database consolidates records previously stored in separate files into a common pool and serves a variety of users and data processing applications. A set of interrelated, centrally coordinated files is referred to as a **database**. For example, the accounts receivable file might be combined with customer, sales analysis, and related files to form a customer database.

By now we understand that a database is simply an organized collection of data with ‘tables’ as its fundamental building blocks. Tables allow us to create the framework for storing information in the database. Each column (also called ‘field’) of the table corresponds to a specific characteristic (or ‘attribute’ in database terms) of the stored information. Each row (also called ‘record’) corresponds to a particular instance of the information.

In physical terms, most computer files are stored on hard disks-spinning magnetic disks inside a computer that can record information indefinitely. Hard disks allow almost instant access to computer files. File can store data or information in various formats. Suppose in a file data is stored in the tables just like the one below:

Table 2.1

| First Name | Last Name | Address             | City     | Age |
|------------|-----------|---------------------|----------|-----|
| Mickey     | Mouse     | 123 Fantasy Way     | Anaheim  | 73  |
| Bat        | Man       | 321 Cavern Ave      | Gotham   | 54  |
| Wonder     | Woman     | 987 Truth Way       | Paradise | 39  |
| Donald     | Duck      | 555 Quack Street    | Mallard  | 65  |
| Bugs       | Bunny     | 567 Carrot Street   | Rascal   | 58  |
| Wiley      | Coyote    | 999 Acme Way        | Canyon   | 61  |
| Cat        | Woman     | 234 Purrfect Street | Hairball | 32  |
| Tweety     | Bird      | 543                 | Itotltaw | 28  |

## Records

As you saw above, each table stores can hold a great deal of data. Each table contains a lot of records. A record is all of the data or information about one person or one thing. In the table below, all of the information about each cartoon character is stored in a 'row' or record.

Table 2.2

| First Name | Last Name | Address             | City     | Age |
|------------|-----------|---------------------|----------|-----|
| Mickey     | Mouse     | 123 Fantasy Way     | Anaheim  | 73  |
| Bat        | Man       | 321 Cavern Ave      | Gotham   | 54  |
| Wonder     | Woman     | 987 Truth Way       | Paradise | 39  |
| Donald     | Duck      | 555 Quack Street    | Mallard  | 65  |
| Bugs       | Bunny     | 567 Carrot Street   | Rascal   | 58  |
| Wiley      | Coyote    | 999 Acme Way        | Canyon   | 61  |
| Cat        | Woman     | 234 Purrfect Street | Hairball | 32  |
| Tweety     | Bird      | 543                 | Itotitaw | 28  |

Records

## Activity

- ❖ What information could you find in the record for Cat Woman?
- ❖ What do you think the database at your college stores records about?
- ❖ How about the library? What records would be stored on that database?

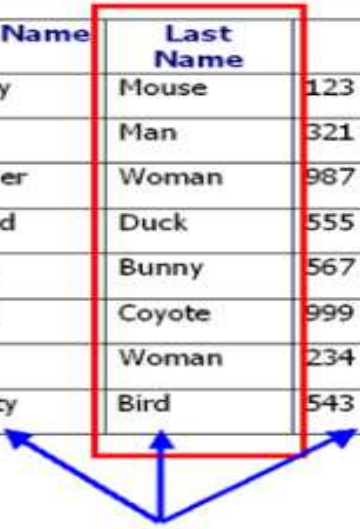
## Fields

Each table contains a lot of records. A record is made up of lots of individual pieces of information. Look at Wonder Woman's record; it stores her first name, last name, address, city and age. Each of these individual pieces of information in a record are called a 'field'. A 'field' is one piece of data or information about a person or thing.

Table 2.3.

| First Name | Last Name | Address             | City     | Age |
|------------|-----------|---------------------|----------|-----|
| Mickey     | Mouse     | 123 Fantasy Way     | Anaheim  | 73  |
| Bat        | Man       | 321 Cavern Ave      | Gotham   | 54  |
| Wonder     | Woman     | 987 Truth Way       | Paradise | 39  |
| Donald     | Duck      | 555 Quack Street    | Mallard  | 65  |
| Bugs       | Bunny     | 567 Carrot Street   | Rascal   | 58  |
| Wiley      | Coyote    | 999 Acme Way        | Canyon   | 61  |
| Cat        | Woman     | 234 Purrfect Street | Hairball | 32  |
| Tweety     | Bird      | 543                 | Itotitaw | 28  |

**Fields**



## Data processing

Once business activity data have been entered into the system, they must be processed to keep the databases current. The four different types of data processing activities, refer as follows:

### Four main activities

- Create new data records:-**Creating** new data records, such as adding a newly hired employee to the payroll database.
- Read, retrieve or view existing data records.

- Update existing stored data records. **Updating** previously stored data.
- Delete data or records.
- **Deleting** data, such as purging the vendor master file of all vendors the company no longer does business with.

## Application Software

Application software consists of programs designed to make users more productive and/or assist with personal tasks

- To make business activities more efficient
- To assist with graphics and multimedia projects
- To support home, personal, and educational tasks
- To facilitate communications

## System software

System software serves as the interface between the user, the application software, and the computer's hardware

## Business software

Business software is application software that assists people while performing business activities.

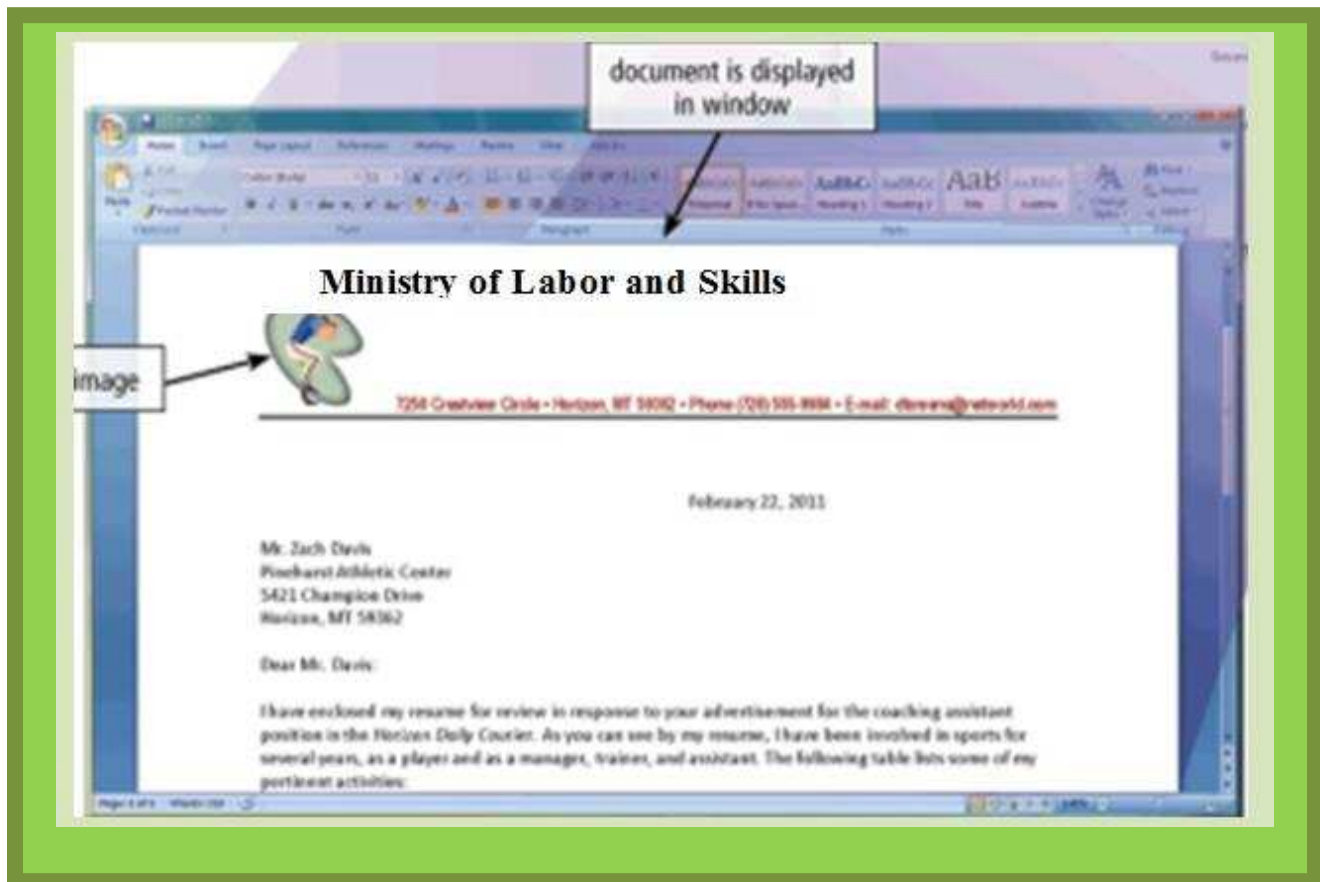
## Type of business software



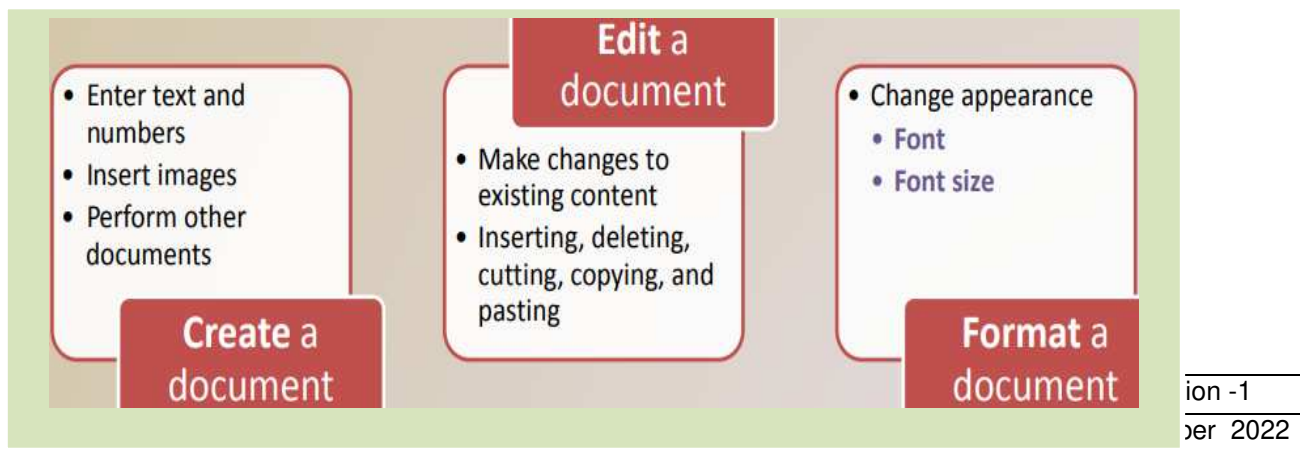
## Word processing

Sample:-Word processing software allows users to create and manipulate documents

**Clip art** is a collection of electronic drawings, photos, and other images

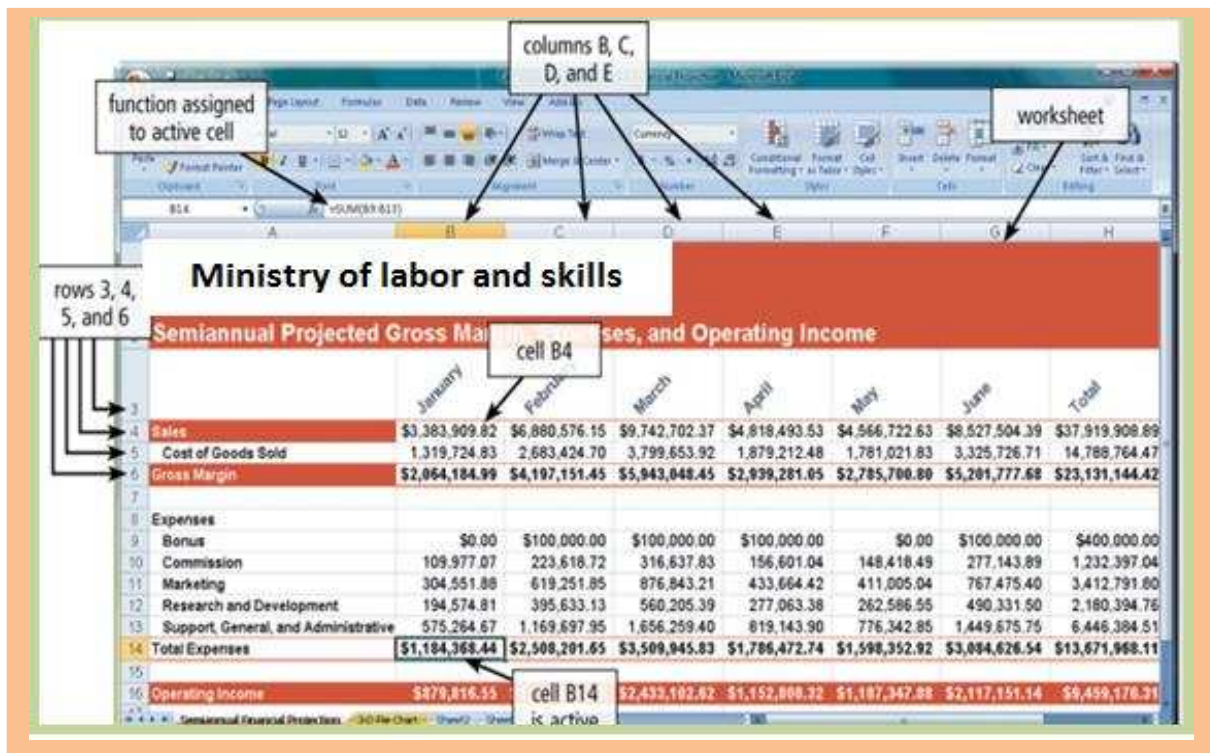


## Developing a document

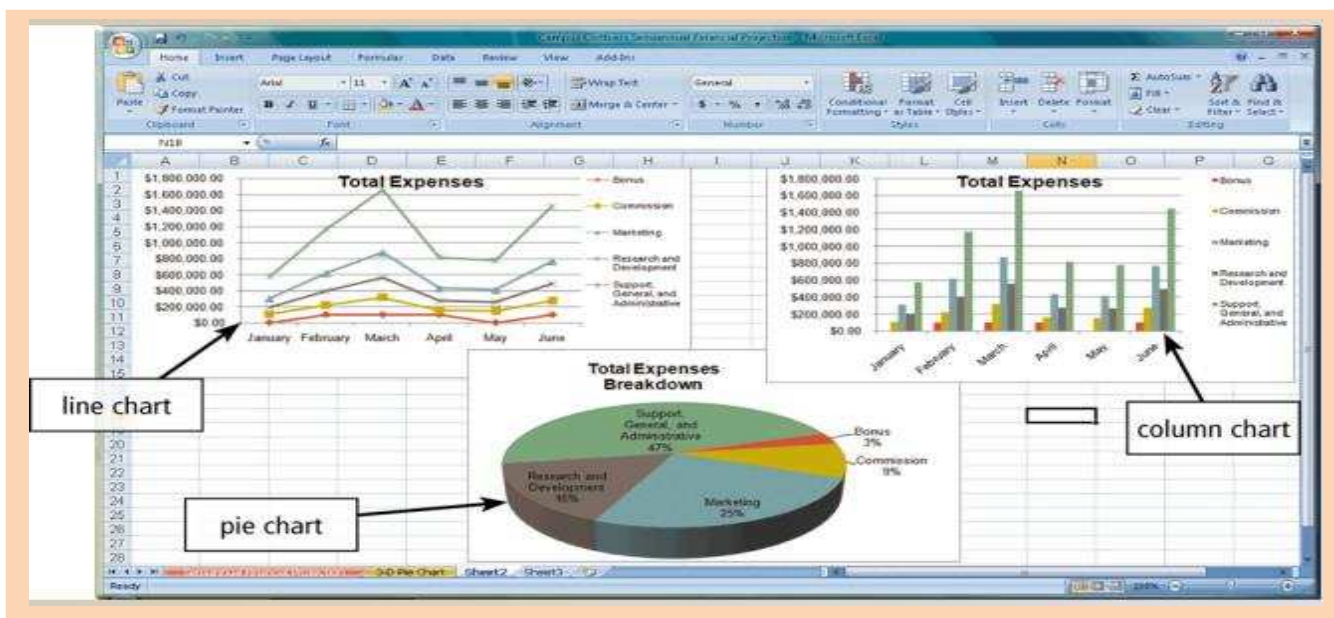


## Spreadsheet

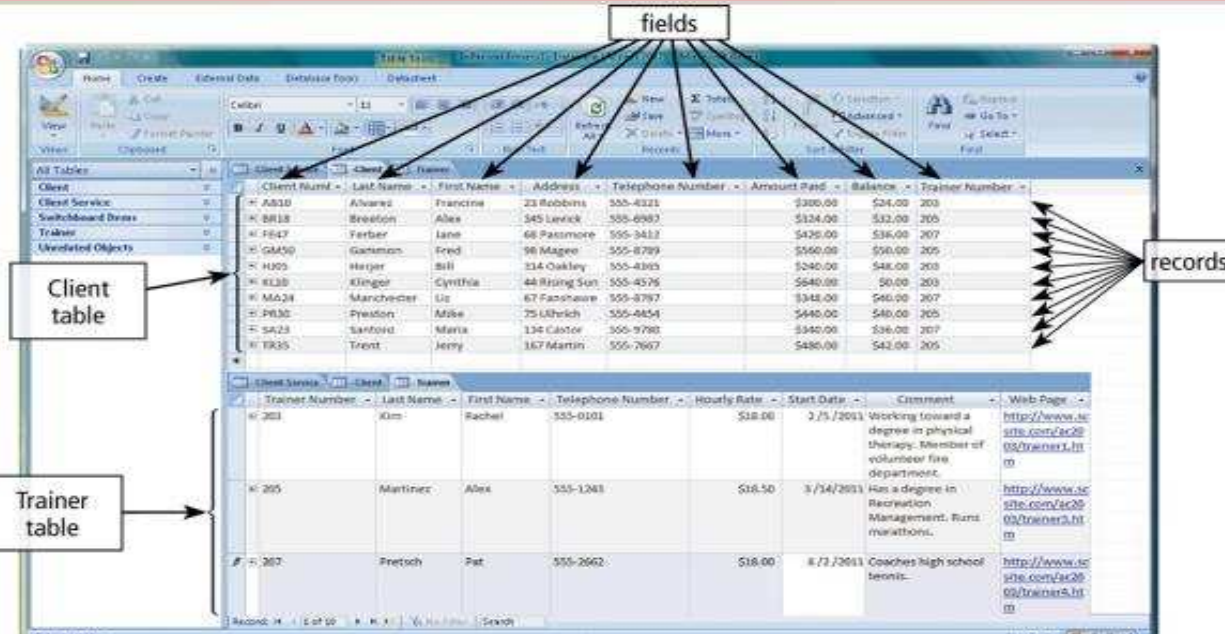
Spreadsheet software allows users to organize data in rows and columns and perform calculations.



Charting depicts data in a spreadsheet in graphical form



Charting depicts data in a spreadsheet in graphical form



**fields**

**Client table**

| Client Num. | Last Name | First Name | Address       | Telephone Number | Amount Paid | Balance | Trainer Number |
|-------------|-----------|------------|---------------|------------------|-------------|---------|----------------|
| A010        | Alvarez   | Francine   | 23 Robbins    | 555-4321         | \$300.00    | \$24.00 | 203            |
| B018        | Brewster  | Alex       | 545 Leavick   | 555-6987         | \$124.00    | \$32.00 | 205            |
| F047        | Ferber    | Jane       | 68 Passmore   | 555-3412         | \$426.00    | \$36.00 | 207            |
| G0450       | Gansmon   | Fred       | 98 Magee      | 555-8789         | \$560.00    | \$50.00 | 205            |
| H009        | Harper    | Bill       | 114 Oakley    | 555-4303         | \$240.00    | \$48.00 | 203            |
| K030        | Klinger   | Cynthia    | 44 Rising Sun | 555-4576         | \$640.00    | \$0.00  | 203            |
| M024        | Marchevet | Us         | 67 Fashawee   | 555-8787         | \$348.00    | \$60.00 | 207            |
| P030        | Preston   | Mike       | 75 Ulfreich   | 555-4454         | \$440.00    | \$40.00 | 205            |
| S023        | Santoid   | Maria      | 134 Castor    | 555-9780         | \$340.00    | \$36.00 | 207            |
| T035        | Trent     | Jerri      | 167 Martin    | 555-7607         | \$480.00    | \$42.00 | 205            |

**Trainer table**

| Trainer Number | Last Name | First Name | Telephone Number | Hourly Rate | Start Date | Comment                                                                           | Web Page                                                                                  |
|----------------|-----------|------------|------------------|-------------|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| 203            | Kim       | Rachel     | 555-0101         | \$18.00     | 2/5/2011   | Working toward a degree in physical therapy. Member of volunteer fire department. | <a href="http://www.sc.edu/sc2009/trainer1.htm">http://www.sc.edu/sc2009/trainer1.htm</a> |
| 205            | Martinez  | Alex       | 555-1243         | \$18.50     | 3/14/2011  | Has a degree in Recreation Management. Runs marathons.                            | <a href="http://www.sc.edu/sc2009/trainer3.htm">http://www.sc.edu/sc2009/trainer3.htm</a> |
| 207            | Pretsch   | Pat        | 555-2662         | \$18.00     | 8/1/2011   | Coaches high school tennis.                                                       | <a href="http://www.sc.edu/sc2009/trainer5.htm">http://www.sc.edu/sc2009/trainer5.htm</a> |

**records**

Examples of Graphics and Multimedia Software

|                                                                                     |                                             |
|-------------------------------------------------------------------------------------|---------------------------------------------|
|  | <b>Professional photo editing software</b>  |
|  | <b>Video and audio editing software</b>     |
|  | <b>Multimedia authoring software</b>        |
|  | <b>Computer-aided design (CAD) software</b> |
|  | <b>Desktop publishing software</b>          |
|  | <b>Paint/Image editing software</b>         |

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## Self-check 2

### Part-I: Choose the correct answer

- According to elements of data storage one of the following is odd  
A. Fields      B. Attributes      C. Entity      D. word-process
- One the following is types of files except one?  
A. Database files      B. Document files      C. Worksheet files      D. none
- one of the following is type of input device but not one?  
B.      Keyboard      B. mouse      C . scanner      D. monitor

### Part I Matching

**Instruction:** select the correct answer for the given column.

| <u>A</u>                         | <u>B</u>     |                |
|----------------------------------|--------------|----------------|
| 1.                               | Type of file | A. database    |
| 2.                               | Records      | B. Output      |
| devices                          |              |                |
| 3.                               | Monitor      | D. Alphabetic, |
| Numeric, etc                     |              |                |
| 4.                               | Input device | E. all of the  |
| data about person/thing          |              |                |
| 5. Types of filing arrangements. | F. Keyboard  |                |

### Test II: short Answer writing

**Directions:** Answer all the questions listed below.

- Clearly define file

2. List types of files
3. Open file by your name and create database based on what you want, then show records and field, save the file properly.

## Unit three Maintain technology

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

- Identifying and replacing used technology consumables
- Carrying out and arranging routine maintenance
- Identifying equipment faults and taking action

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

Specifically, upon completion of this learning guide, you will be able to:

- Understand technology consumables and replace
- Carry out routine maintenance and/or arrange equipment
- Perform equipment faults accurately and take action

## 1.1 Identifying and replacing used technology consumables

All organizations need to maintain technical equipment and consumables. Routine or preventative maintenance ensures that technical equipment remains in good working order. Business technology may be maintained in-house or by using a manufacturer-approved technician. By routinely cleaning and maintaining equipment, you can prevent problems and faults occurring. There are some maintenance processes you can do yourself to keep the equipment you use in good working order. For example, you can routinely clean your keyboard, monitor and mouse by using a damp cloth or other cleaning materials such as monitor wipes. You can remove dust from inside your keyboard by turning it upside down and tapping it.

### ii. Identifying technology needs maintenance

#### Maintenance in an IT environment

- Some items requiring maintenance in an IT environment would be:

**Printers-** Printouts may be streaky or faded. The printer may need either cleaning or new cartridge.

**Monitors-** Fingerprints may make the text difficult to read.

**PC's-** A PC may not boot correctly. In investigation required and possible re-installation of the operating system.

#### Scanner

**Disk Drive-** The system may not read floppy disks. The drive may need cleaning.

**Replacing paper-** Printers, photocopiers and fax machines may run out of paper.

#### Precautions

Precautions are guidelines to be followed to prevent damage to equipment or injury to people.

The following are very important precautions:

- Before cleaning any electrical equipment make sure that it is switched off and unplugged from the mains.
- Allow certain equipment, such as monitors and laser printers, to cool down and lose their capacitance (charge) before cleaning them for at least 30 minutes.

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- When cleaning inside the PC, or handling parts from a PC such as hard disk or circuit boards, you should earth yourself using antistatic wrist strap.
- Always refer to the manufactures manual before attempting to clean any equipment, because improper cleaning or maintenance may be dangerous and also may invalidate your warranty. Some equipment such as power supplies and monitors use voltages and therefore should only be maintained by specially trained people. It could be dangerous for anyone else to open these up for maintenance.

## **b. Carrying out and arranging routine maintenance**

Preventive maintenance reduces the probability of hardware or software problems by systematically and periodically checking hardware and software to ensure proper operation.

### **Hardware**

Check the condition of cables, components, and peripherals. Clean components to reduce the likelihood of overheating. Repair or replace any components that show signs of damage or excessive wear.

Use the following tasks as a guide to create a hardware maintenance program:

- Remove dust from fan intakes.
- Remove dust from the power supply.
- Remove dust from components inside the computer.
- Clean the mouse and keyboard.
- Check and secure loose cables.

### **Software**

Verify that installed software is current. Follow the policies of the organization when installing security updates, operating system updates, and program updates. Many organizations do not allow updates until extensive testing has been completed. This testing is done to confirm that the update will not cause problems with the operating system and software.

Use the tasks listed as a guide to create a software maintenance schedule that fits the needs of your computer equipment:

|               |                                                  |                                                             |                             |
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- Review security updates.
- Review software updates.
- Review driver updates..
- Scan for viruses and spyware.
- Remove unwanted programs
- Scan hard drives for errors.

## Cleaning Peripherals

### Liquid spillages /(Electrical safety hazards )

To avoid electric shocks, alert staff of the need to keep liquids away from all equipment connected to the electricity supply.

Advise staff to disconnect equipment from power supply before mopping up spills.



## Monitors

Carefully clean dust away from the vents in the monitor's enclosure using a vacuum cleaner.

Anything other than a vacuum cleaner (e.g. a rag or air blower) is likely to push the dust inside the enclosure where it can lie on electrical components, causing failure. You should clean the glass screen with one of the cleaners described previously. If you use a spray to clean a monitor you should be careful to spray the wipe.

## Printers

|               |                                                  |                                                             |                             |
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You will get the greatest benefit from cleaning a printer if you can remove any dust from the paths of moving parts. To do this you may need to remove covers or paper trays. However, at all times refer to the printer manual. It will contain the instructions for removing parts and may even have some tips on cleaning. Do not use any liquid cleaner on a printer unless the manufacturer recommends it.

## Guidelines

### To clean printers:

- Switch off and unplug the printer, and wait at least 30 minutes for it to cool.
- Wear disposable plastics gloves.
- Clean the outer casing of the printer using a dampened paper towel
- Check for, and remove any loose bits of paper.
- Vacuum inside the printer using a static-safe vacuum cleaner.

## Keyboards

The keyboard tends to not only accumulate a lot of dust and skin residue but also some hair and lint from clothing. Loose matter can generally be removed with the vacuum cleaner.



Figure b-1 keyboard and mouse

## Mouse

The mouse tends to accumulate a mixture of dust and skin residue from the surface it rolls on. Therefore to properly clean the mouse:

- ❖ Turn the mouse upside down and push down and away the roller-opening hatch with two fingers until you see the panels open.
  1. Use a soft, dry, lint free cloth to wipe the ball clean. Never use cleaning fluid or solvent.
  2. To clean the steel rollers carefully use a cotton swab to remove the material buildup.
  3. Replace the ball in its housing, and then re-insert the retaining panel. When the panel is in place push it down and backwards until it locks firmly.

### **Benefits**

Be proactive in computer equipment maintenance and data protection. By performing regular maintenance routines, you can reduce potential hardware and software problems. Regular maintenance routines reduce computer downtime and repair costs.. This list of tasks can then be used to create a maintenance program.

### **The following are the benefits of preventive maintenance:**

- Increases data protection
- Extends the life of the components
- Increases equipment stability
- Reduces repair costs
- Reduces the number of equipment failures

Maintenance expectations

In business organization, properly performed maintenance has the following out comings or benefits for the organization.

- Increase in productivity of labor
- Increase in quality of products
- Minimize operation cost
- Less man power
- Less spare parts used
- Minimize power consumption

|               |                                                  |                                                             |                             |
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- Safe working condition

#### **Replacing used Technology consumables**

- Back-up tapes
- CD-ROM
- Floppy disks
- Print heads
- Printer ribbons and cartridges
- Toner cartridges

### **3.3. Identifying equipment faults and taking action**

Equipment faults that are not dangerous will also require you to speak to others to organize repairs. You will be more effective if you know the correct terms for key parts of the equipment. Manufacturer's instructions are likely to contain a labeled diagram of the equipment you can use.

#### **Identifying equipment faults may include:**

- Checking repairs have been carried out
- Encouraging feedback from work colleagues
- Keeping a log book of detected faults
- Preparing a maintenance program
- Regular back-ups of data
- Regular OHS inspections
- Routine checking of equipment

### **Computer Preventive Maintenance Schedule**

With proper maintenance you can avoid trouble and keep your computer running at peak efficiency. The basic steps are:

- Keep your operating system up-to-date with all the latest security releases.

|               |                                                  |                                                             |                             |
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- Run an anti-virus program regularly to keep your computer bug free.
- Run system utilities regularly to make sure your hardware is operating correctly.

**Table 3.1. a schedule prepared for computer maintenance/you can use as a guide.**

|                                           | Daily | Weekly | Monthly | Annually |
|-------------------------------------------|-------|--------|---------|----------|
| Delete Temp Windows Files                 | X     |        |         |          |
| Run Virus Scan                            | X     |        |         |          |
| Windows Update                            |       | X      |         |          |
| Run Spigot                                |       | X      |         |          |
| Run Ad-Aware                              |       | X      |         |          |
| Check for Updates software                |       | X      |         |          |
| Run Disk Cleanup                          |       | X      |         |          |
| Run Scan Disk/Check Disk                  |       |        | X       |          |
| Run Disk Defragmenter                     |       |        | X       |          |
| Check for Updates to Adobe Reader         |       |        | X       |          |
| Clean Computer, Mouse, Keyboard & Monitor |       | X      | X       | X        |

### Self-check 3

#### **Part I Matching**

**Instruction:** select the correct answer for the given column.

##### **A**

1. Outcome of maintain

2. the table

3.

4. equipment and Windows Update

##### **B**

A. Checking repairs have been carried out

Equipment fault

Technology consumable

Schedule

B. each data in

C. CD

D. Cleaning

#### **Test II: short Answer writing**

**Directions:** Answer all the questions listed below.

2. needs maintenance and prepare schedule.

3. consumable.

List technologies equipment

List replaceable technology

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|               |                                                  |                                                             |                             |
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## Annex1: Ergonomic

