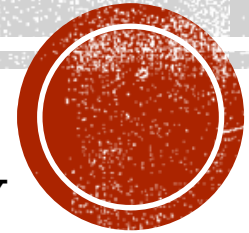
MAKERERE UNIVERSITY BUSINESS SCHOOL
FACULTY OF COMPUTING AND INFORMATICS
DEPARTMENT OF APPLIED COMPUTING & IT
ACADEMIC YEAR 2024/2025



PROGRAM: BACHELOR OF BUSINESS STATISTICS
COURSE NAME: INFORMATION AND COMMUNICATION TECHNOLOGY
COURSE CODE: BUC2126 CREDIT UNITS: 5
YEAR OF STUDY: TWO
SEMESTER: ONE

FACILITATORS:
DR. ROBINAH NABAFU, MR. CHARLES OLUPOT, MR. JUMA KINYIRI, AND MS. REES ATIM

COURSE OUTLINE

Foundational concepts

1. Introduction to computers
2. Architecture of the computer
3. Computer software
4. Web technology and networks

Practical Hands-on Sessions

5. Word Processing
6. Presentations
7. Spreadsheets and modelling

1.0 INTRODUCTION TO COMPUTERS

WHAT IS A COMPUTER?

Computer

ComputerHope.com

1.1 WHAT IS A COMPUTER

- A computer is an electronic device operating under the control instruction stored in its own memory unit, accepts and stores data, performs arithmetic and logical operations on that data (without human interventions) and produces output.
- Its hardware components include input & output devices, CPU, communication, and primary and secondary storage devices.

CHARACTERISTICS OF COMPUTERS

- It comprises of electronic elements like transistors, resistors, disorders etc.
- Has an internal storage or memory for storing both the instruction and data being processed
- Uses programs or set of instruction with specific procedure of operation to be followed
- The programs uses can be modified when need arises
- Computers exist in varying sizes, speed of processing, memory capacity, use and cost

CLASSIFICATION/TYPES OF COMPUTERS

Classification according to Size

- Mini/Micro Computer Systems
- Midrange computer systems
- Micro computer systems
- Mainframe computer systems
- Super computer systems

Classification according to Process

- **Process:** Analogue; hybrid & digital
- **Purpose:** Special & General

1. CLASSIFICATION ACCORDING TO SIZE

MICRO COMPUTERS

- These are the smallest computer systems, ranging in size from handheld personal digital assistants (PDAs) or even "computer on a chip" to laptops, personal computers (PCs) and workstations.
- Most microcomputers are designed for single-user application but can be linked via telecommunications to network servers.
- Microcomputers are small, low-cost, single-user digital computers and also the least powerful.
- These computers are also called portable computers.
- Handheld PC & information appliances.
- They are most favorable for business people, civil servants and other professional consumers, all known as knowledge workers.
- Examples include desktop computers, Workstation Computers, Network Servers, notebooks or laptops, smartphones, tablets, etc.

MICROCOMPUTER SYSTEMS

MINICOMPUTER SYSTEMS

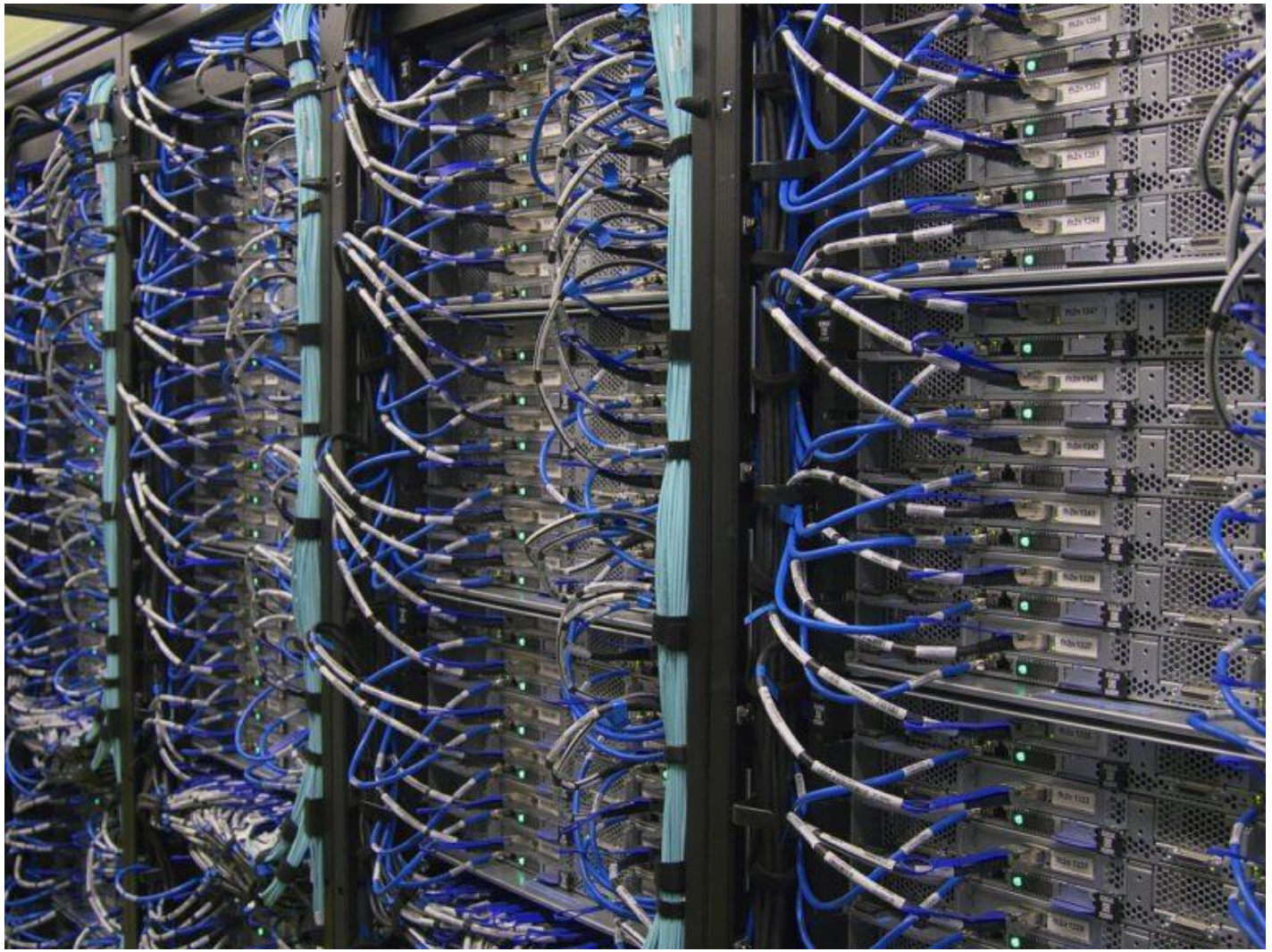
- These types of computers are generally used in multi-user systems. They have high processing speed and high storage capacity than microcomputers.
- Their speeds are rated between 1 and 50 million instructions per second (MIPS).
- They are categorized into network servers, minicomputers, Web servers, multiuser systems etc.
- They are general-purpose computers that are larger & more powerful than most microcomputers but are smaller & less powerful than the mainframe.
- The use of minicomputers grew rapidly because of their relatively low cost, ease of operation and support, and the ready availability of software to solve business problems. Thus managers had to make significant shift from the large, central mainframe to end users.
- Examples include; IBM-17, PDP-11, and HP 9000 are some of the widely used microcomputers.

MINICOMPUTER SYSTEMS

MAINFRAME COMPUTERS

- These computers are multi-user, multi-programming, high performance, and have a very high speed, and large storage capacity.
- Mainframe computers are the backbone of the entire business world with the capacity to handle the workload of many users.
- Mainframe computers can also be categorized into enterprise systems, superservers, transaction processors among others
- Examples include IBM-370, IBM ES000 series, UNIVAC- 1110, etc. are examples of mainframe computers.

MAINFRAME COMPUTERS



SUPER COMPUTERS

- The largest, fastest, most powerful and most expensive computer systems.
- They have a high processing speed compared to other computers.
- The actual performance of a supercomputer is measured in FLOPS instead of MIPS.
- Designed for large data requiring fast and complex performance applications such as weather forecasting, engineering and other business applications
- Examples include; IBM Blue gene and Intel ASCI red, IBM Roadrunner, and PARAM

SUPER COMPUTERS

1. CLASSIFICATION ACCORDING TO PROCESS:

a) Analogue computers
b) Digital computers
c) Hybrid computers

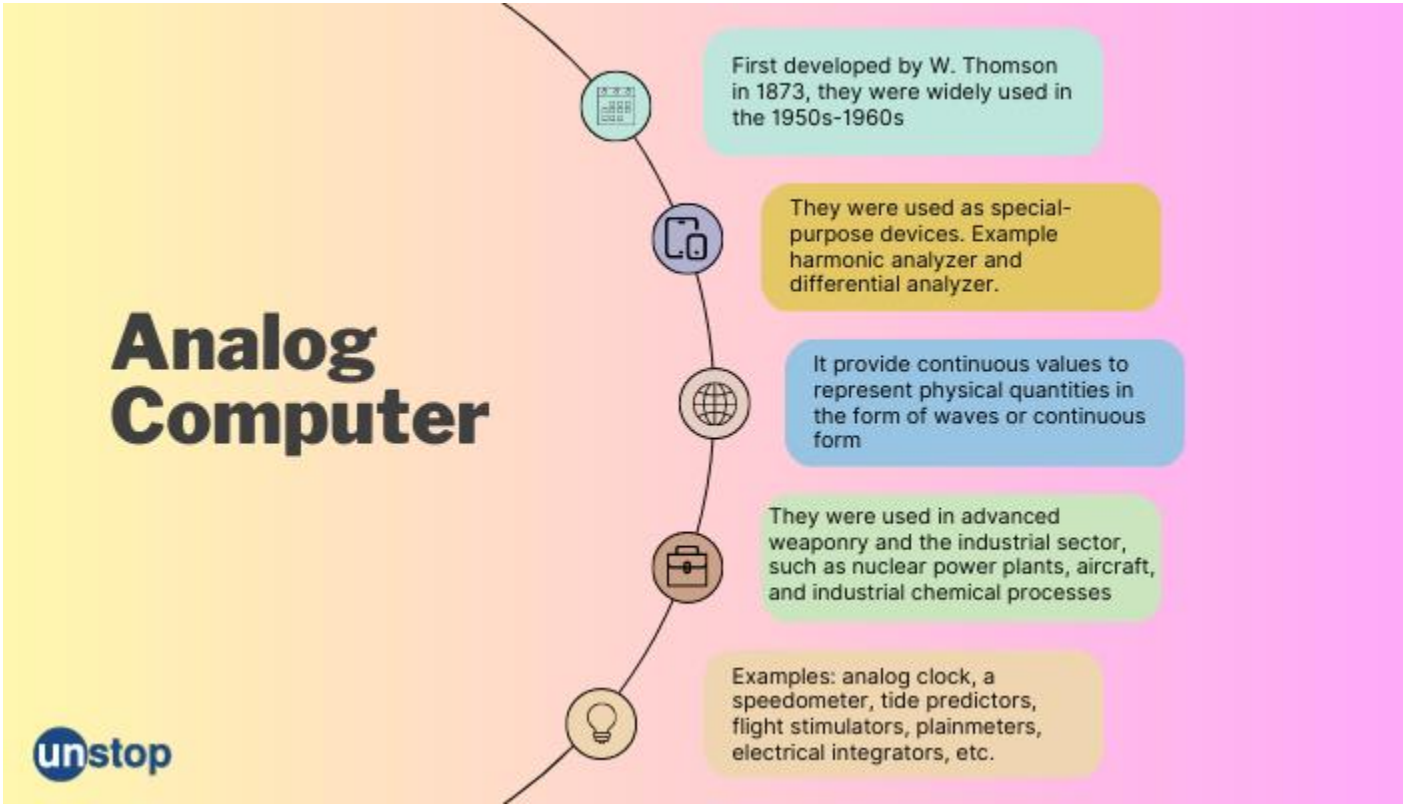
- **Individual Assignment:**
- Students to research and make notes in the following areas;
  1. The Differences between Analogue and digital computers
  2. Hybrid computers
  3. Binary numbers in computers

a) ANALOGUE COMPUTERS

- It was first developed by William Thomson in 1873 and A.A. Michaelson and S.W. Stratton
- Widely used during the 1950s-1960s.
- A device in which continuously **variable physical quantities** are represented to match the corresponding quantities in the problem to be solved.
- Examples of **variable physical quantities** include fluid pressure, mechanical motion, or electrical potential.
- Operate on mathematical variables
- However, analoque computers were not efficient in accepting high-level computing problems

a) ANALOGUE COMPUTERS

- late 20th century, saw advancements in analogue computers
- advanced examples of analogue computers include analog clock, a speedometer, tide predictors, and flight stimulators, plainmeters, electrical integrators, operational amplifiers, and nanograms, among others



https://unstop.com/blog/difference-between-analog-and-digital-computer

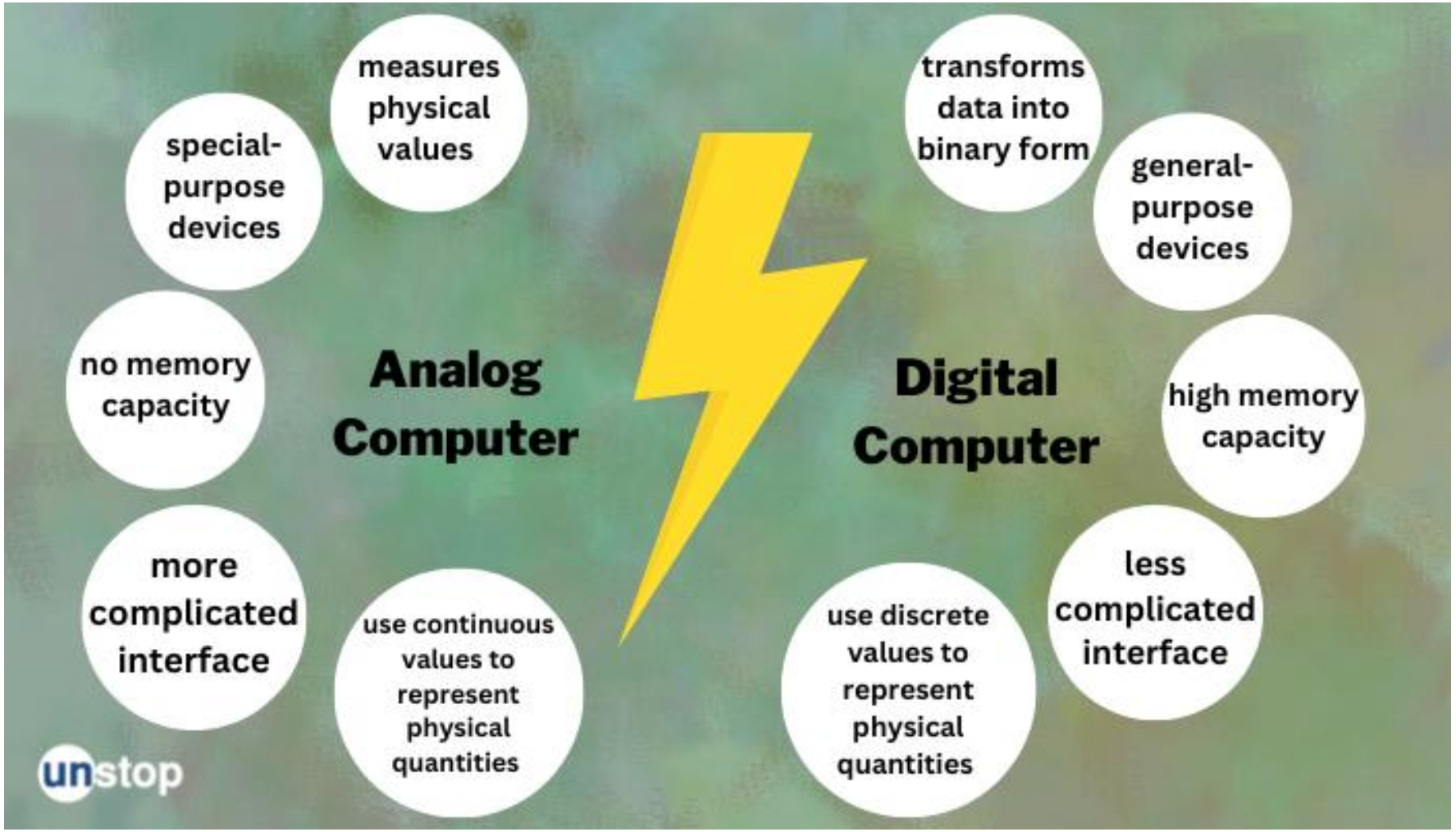
a) DIGITAL COMPUTERS

- Emerged in the 1980s and 1990s
- A digital computer is a device that breaks down critical information into discrete units to solve complex problems.
- Digital computers uses binary number system: 0 and 1.
- Apart from this, it also employs letters, symbols, and magnitudes for executing complex operations.
- Digital computers can perform tasks involving controlling heavy machinery, analyzing and organizing data, and even simulating complex systems.
- Has the ability to store large amounts of memory.

a) DIGITAL COMPUTERS

- Uses basic structure of input, processing, and output.
- There are four main functional elements in a digital computer. These are:
  1. Input-output equipment
  2. Main memory
  3. Control unit
  4. Arithmetic-logic unit
- **Examples today include;** calculator, digital clocks, a smartphone, personal computers, weighing machines, digital cameras, and ATM machines.

DIFFERENCE BETWEEN ANALOGUE AND DIGITAL COMPUTERS



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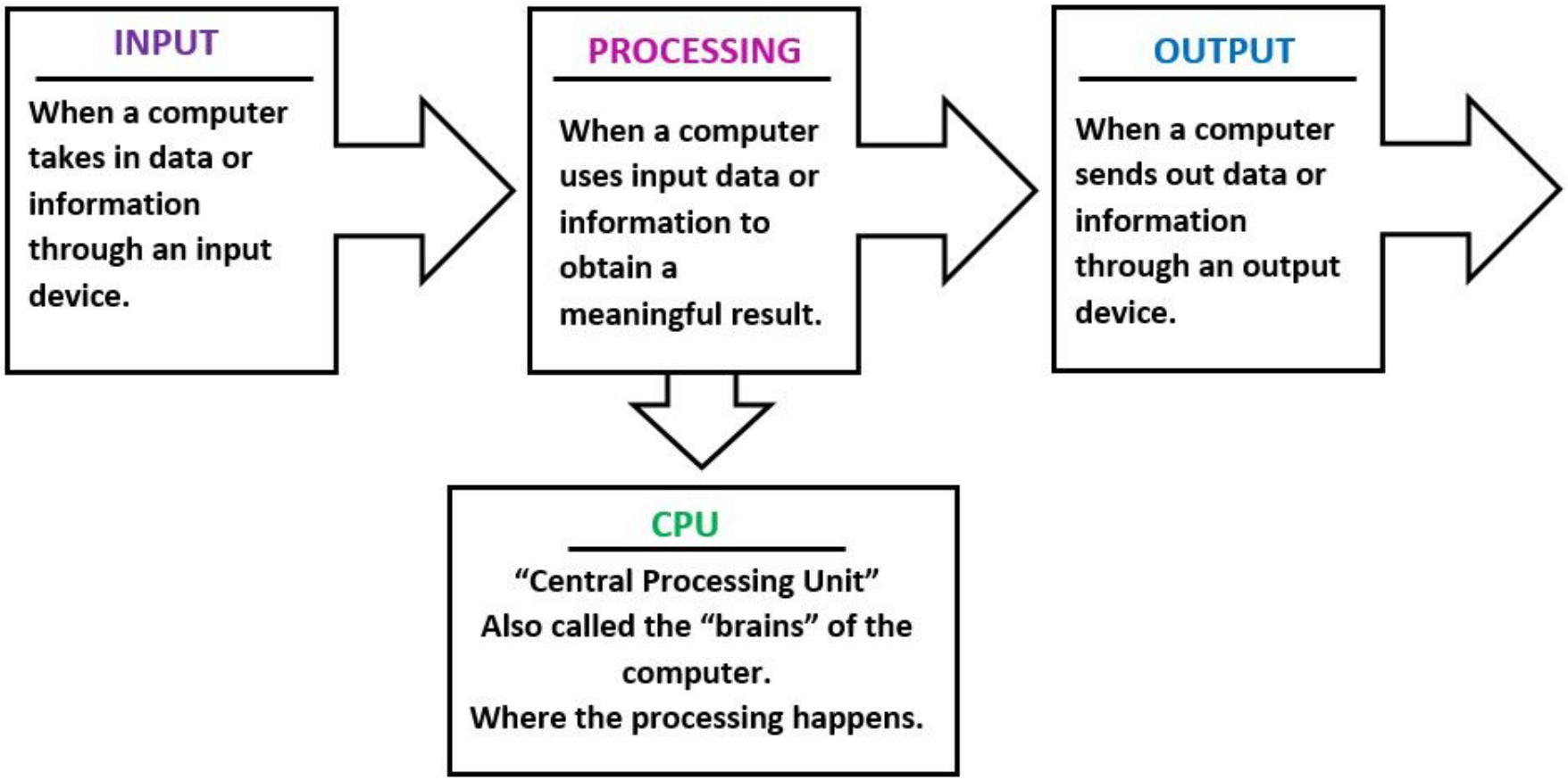
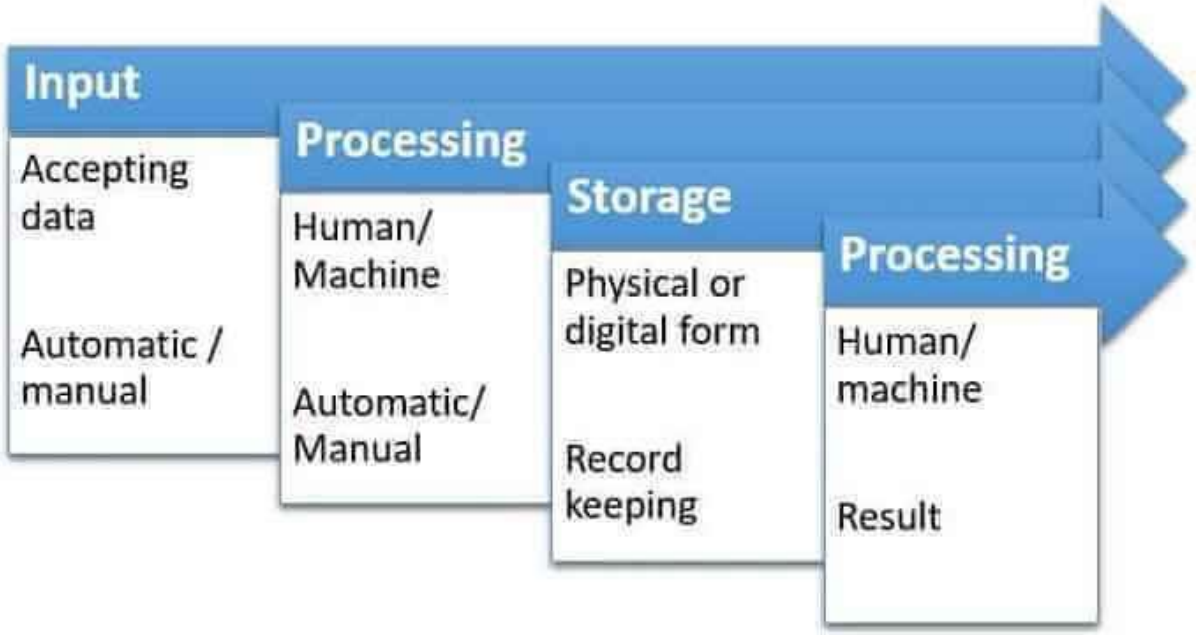
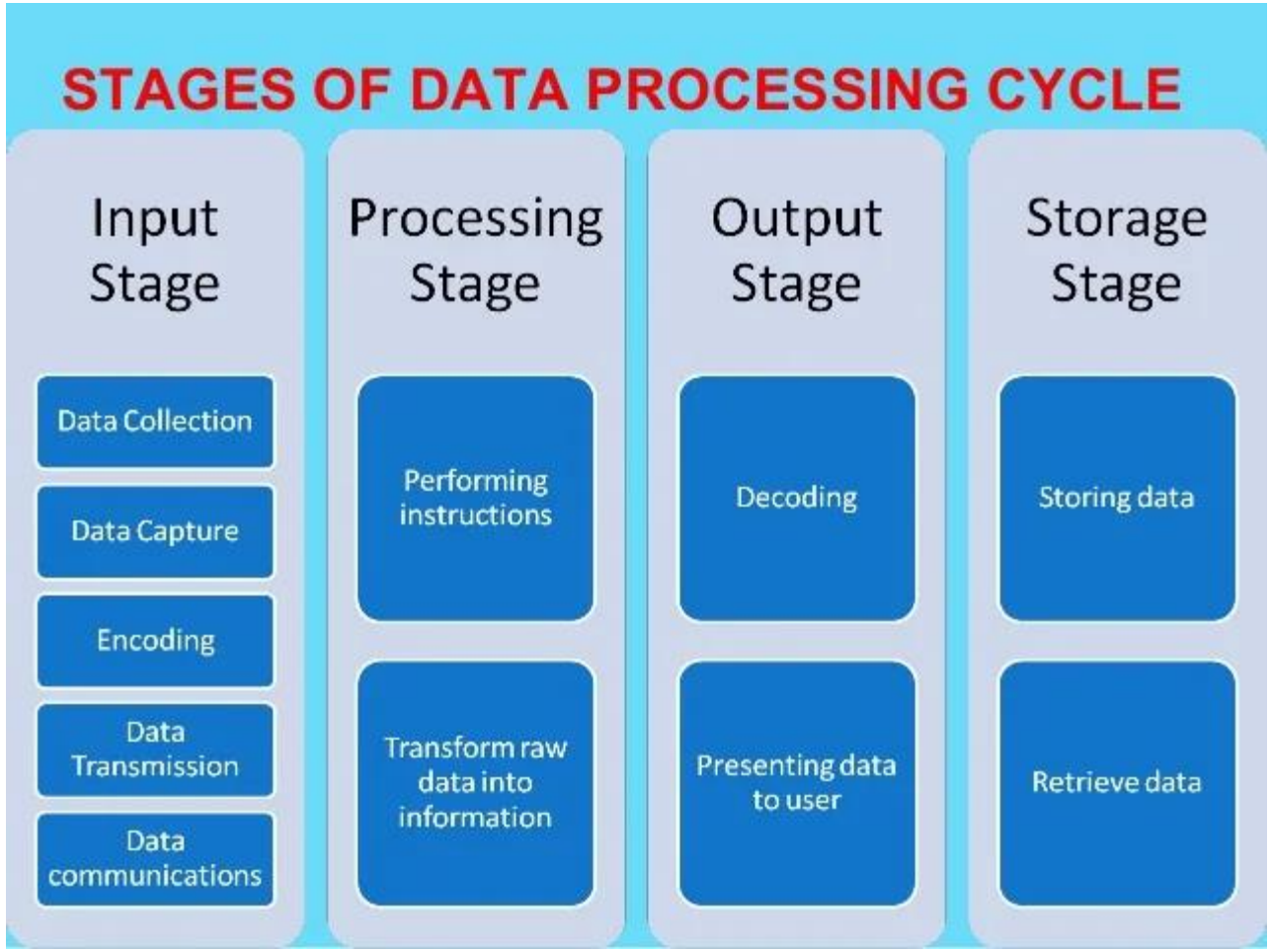
1.2 BASIC COMPUTER PROCESSING

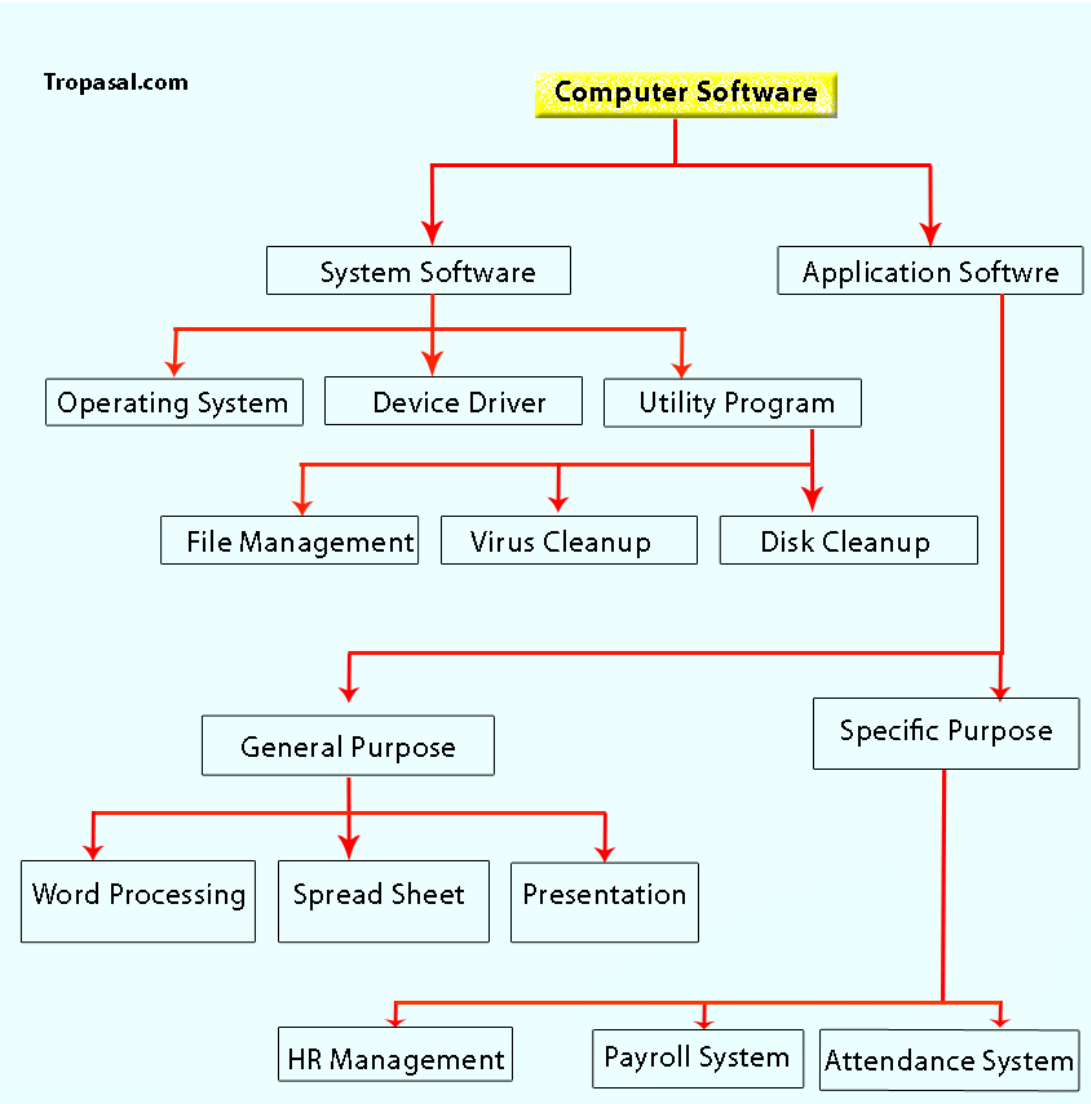


1.2 BASIC COMPUTER PROCESSING





1.2 COMPUTER SOFTWARE CATEGORIES



1.2 COMPUTER SOFTWARE CATEGORIES

System Software

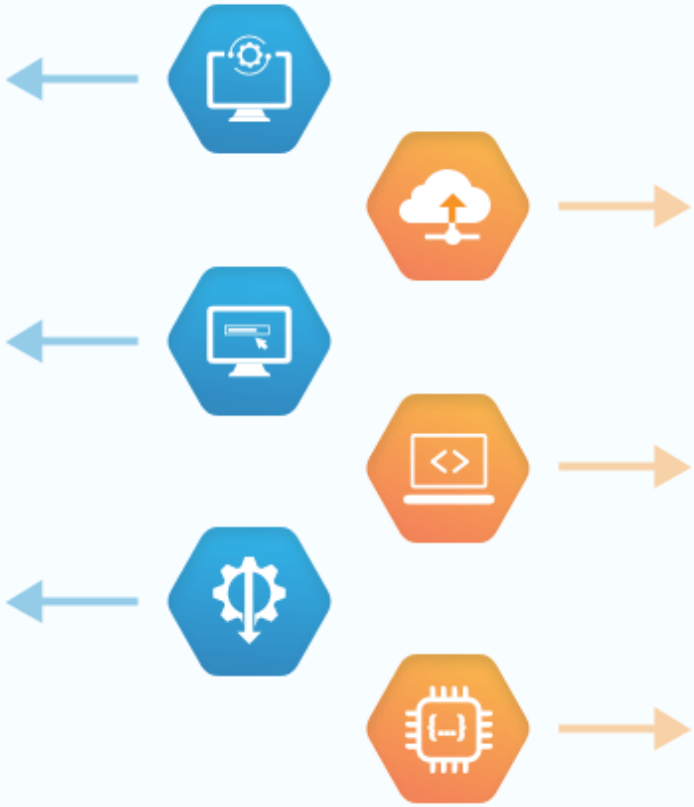
This software provides an environment to integrate hardware with software and thus create the

Application Software

This software provides users with functionalities to perform a task of interest.

Driver Software

This software drives all the devices that make a computer system.



Middleware

This software serves as the interface between distributed applications

Programming Software

This is commonly referred to as programming language and is used to develop programs, build software applications and analyze data.

Embedded Software

These software interfaces are embedded into hardware and dictate the hardware to act in a certain way.

FINOIT

1.3 COMPUTER SOFTWARE

- Common types of software include;

1. **System Software:** Examples include;
   a. ***Operating System (OS):*** *referred to as the* master program, the OS serves as the main control program that manages other applications in the system.
   b. ***Basic Input Output System (BIOS):*** Eg. Determines what action clicking the right button of your mouse initiates.

2. **Application Software:** Includes commercial off-the-shelf software (COTS) and custom software
   a. ***Commercial off-the-shelf software (COTS)***
      - **General Purpose Application Software:** Provides generic features which can used for a variety of tasks. MS Word is an example that can ne used to write articles, create tables, as well as build newsletters
      - **Specific Purpose Application Software:** It enables the Enterprise to meet bespoke needs. Examples include Healthcare applications such as electronic medical records (EMRs), telemedicine software, and data analysis software

1.3.1 COMPUTER SOFTWARE CATEGORIES

- Common types of software include;

3. **Driver Software:** it is a program that drives your system. Examples include motherboard drivers, USB drivers, mouse drivers, keyboard drivers, VGA drivers, audio drivers, video drivers, etc.

4. **Middleware**
   a. *Transaction Middleware:* It updates the database by managing transaction processing between a client and the server.
   b. Database Middleware: When an application wants to communicate with a database, database middleware comes into the picture.
   c. *Message-oriented Middleware:* It directs the messages from diverse clients to appropriate servers, and thus regulates the continuous asynchronous communication.

1.3.1 COMPUTER SOFTWARE CATEGORIES

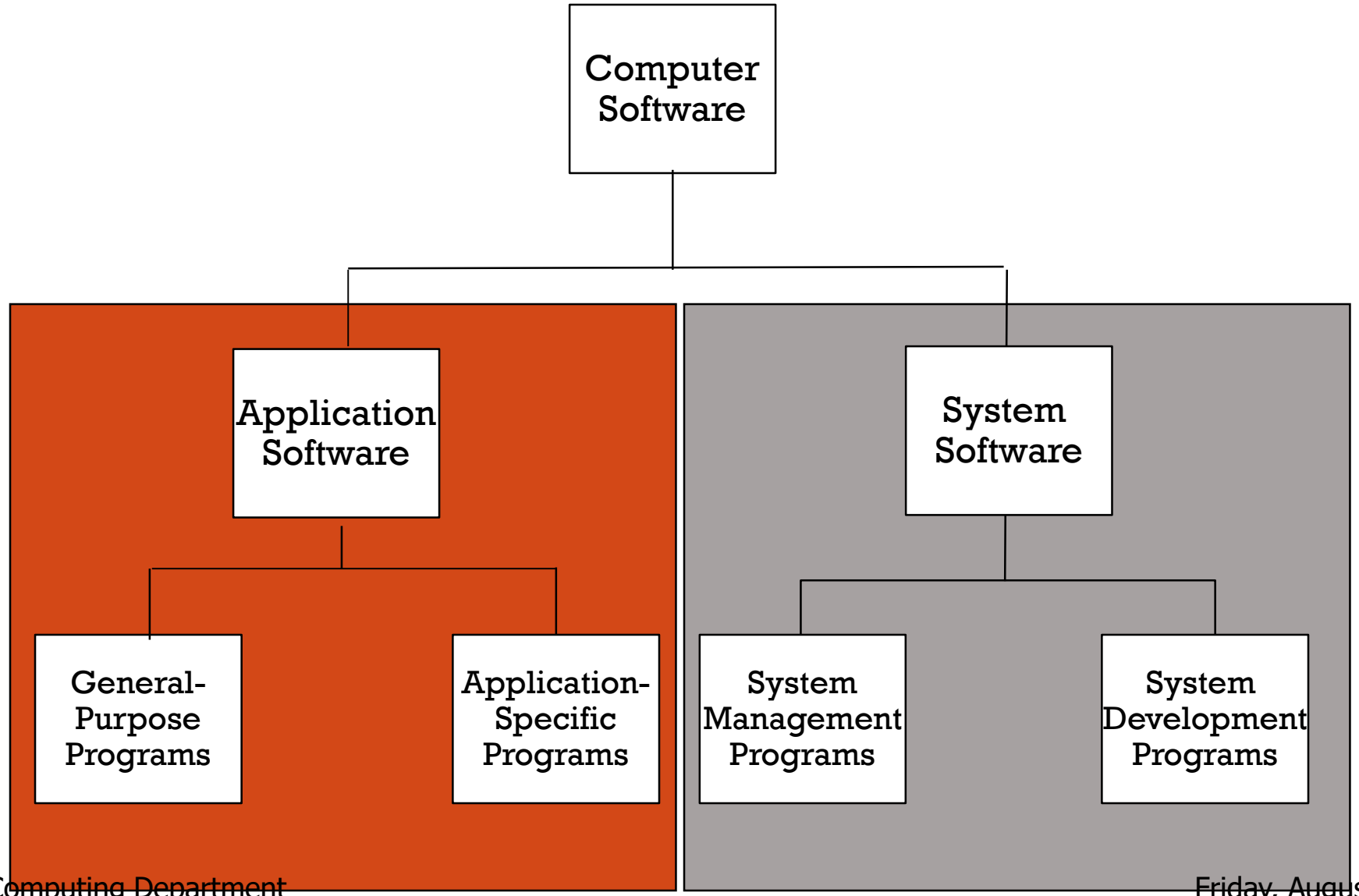
5. **Programming Software:** helps create, debug, update, and maintain applications. Examples include;
   a. *Assemblers:* When you type in instructions in your program, the assembler converts them into a form that your computer processor can understand.
   b. *Compilers:* compilers analyze the written code and convert them into low-level form.
   c. *Debuggers:* These test the programs for errors and bugs against a set of defined standards that a given programming software follows.
   d. *Interpreters:* interpreters interpret a high-level code into the version that can be interpreted by the machine

https://www.finoit.com/articles/types-of-software/

1.3.1 COMPUTER SOFTWARE CATEGORIES

6. **Embedded Software:** software interfaces that are embedded into hardware to dictating the hardware to act in a certain way. They include the following;
   a. *Embedded Bare-metal software:* Examples include programming interfaces to operate your washing machine.
   b. *Embedded RTOS (Real-time Operating System) Software:* Types of equipment that perform actions in real-time such as industrial control systems, flight control, and real-time simulation models all work using embedded RTOS software.
   c. *Embedded Networking software:* These are software applications that enable devices to interact with the external environment. The simplest example is earphones connecting with smartphones via Bluetooth

CATEGORIES OF COMPUTER SOFTWARE



SYSTEM SOFTWARE

1. SYSTEM SOFTWARE

- Systems software is a program that control and support the operations of a computer system as it performs various information processing tasks.
- There are two major functional categories of system software; namely: systems management programs and system development programs.

1. SYSTEM MANAGEMENT PROGRAMS

- It controls and coordinates the operation of the various components and peripheral devices of a computer system.
- E.g. Operating Systems, database management systems, network management programs, systems utilities, application servers, and performance and security monitors.

2. SYSTEM DEVELOPMENT PROGRAMS

- It is a program used to help users to develop and build new application programs or specific information systems applications.
- Major examples include programming language and translators, programming editors and tools and CASE (Computer-Aided Software Engineering) packages.

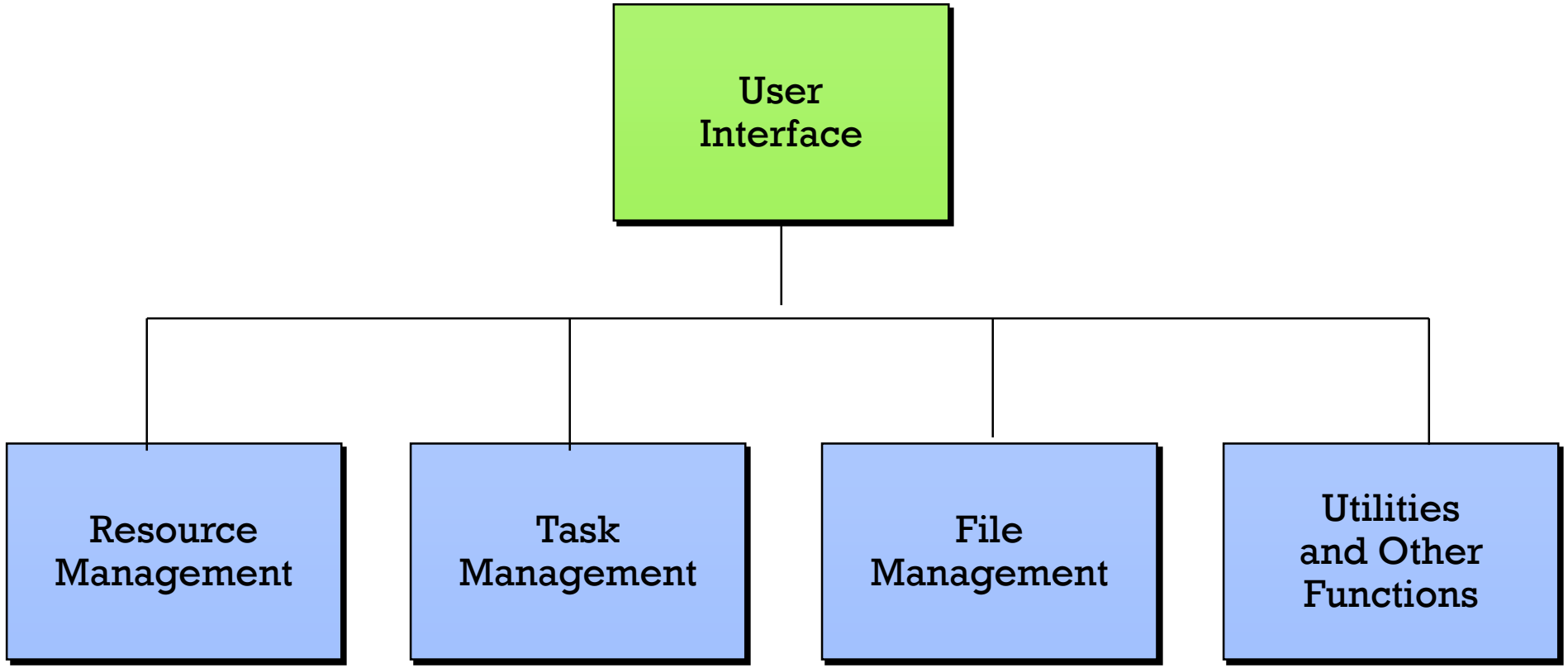
SYSTEM MANAGEMENT PROGRAMS

- *Operating systems*
- Database management systems
- Network management programs
- *Systems utilities*
- Application servers
- Performance monitors
- Security monitors.

OPERATING SYSTEMS

- The operating system is a system of programs that manages the operations of the CPU, controls the input/output and storage resources and activities of the computer system, and provides various support services such as scheduling, system accounting, debugging etc, as the computer executes the application programs of end users.
- That is, a program that manages the computer hardware.

BASIC FUNCTIONS OF OPERATING SYSTEMS



FUNCTIONS OF OS

- **The user interface:**

This is the part of the operating system that allows users to communicate with the computer. Through the interface, the end user has access to the resources such as resource management; file management; task management and utilities.

FUNCTIONS OF OS CONT'

- **Efficient resource management**. It manages the computer memory for example memory allocation and loading of programs on the hard disk.
- **File management:** For example maintenance of file for proper storage, opening and closing of files, checking on the file levels, etc.
- **Task management:** It checks whether the hardware (including peripheral devices such as printers) is functioning properly.

FUNCTIONS OF OS CONT'

- **Utilities and support services:** Such as error detection and reporting for example display of a message on screen if a fault is detected within the hardware component.
- **Security:** Controlling system security for example monitoring the use of passwords.
- **Initial start-up of the computer:** When it's switched on. This is achieved by the boot program which is in-built in the ROM.
- Managing multitasking

What are the different types?

Linux is a Unix-like computer operating system assembled under the model of free and open source software

development and distribution.

Microsoft Windows is a series of graphical interface operating systems developed, marketed, and sold by Microsoft.

Mac OS is a series of graphical user interface-based operating systems developed by Apple Inc. for their Macintosh

iOS (previously **iPhone OS**) is a mobile operating system developed and distributed by Apple Inc. Originally unveiled in 2007 for the iPhone, it has been extended to support other Apple devices such as

the iPod Touch

Android is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers. Initially developed by Android, Inc.

BSD/OS had a reputation for reliability in server roles; the renowned Unix programmer and author W. Richard Stevens used it for his own personal web server for this reason.

1. WINDOWS FAMILY OS

- The most common type is the Microsoft suite of operating systems.
- They include from most recent to the oldest as follows: Windows 7, Windows Vista, Windows XP Professional Edition, Windows XP Home Edition, Windows 2000, Windows ME, Windows 98, Windows NT, Windows 95 and Microsoft DOS.

2. UNIX FAMILY OF OPERATING SYSTEMS.

- UNIX family has been developed by a whole history of individuals, corporations and collaborators.
- It is a multitasking and multiuser system, network-managed operating system whose portability allows it to run on mainframes, midrange computers, and microcomputers.
- It can be difficult to learn. UNIX must normally run a computer made by the same company that produces the software. An example is Linux.

3. MACINTOSH OPERATING SYSTEMS

- This is the latest operating system from Apple for the iMac and other Macintosh microcomputers, based on UNIX has advanced multitasking and multimedia capabilities, along with a new suite of Internet services called iTools.

- The greatest problem with these operating systems lies in the fact that, not as many application programs are written for them. Another drawback is that the system can only be run on Apple produced hardware.

MULTIPROGRAMMING & MULTITASKING

1. Multiprogramming

- Multiprogramming is the ability to execute multiuser programs concurrently through a sharing of the computer's resources.

- A multiprogramming operating system takes advantage of this fact by allowing another program to use the CPU when it would otherwise be idle.

MULTIPROGRAMMING & MULTITASKING

2. Multitasking

- Multitasking is a task management approach that allows the user to run two or more programs at the same time. Thus a user may be updating a spreadsheet while spell checking a document using a word processor.

UTILITIES OR SERVICE PROGRAMS

- This is a program which performs a function that may be required by a number of other programs and provide a range of tools that support the operation and management of a computer system, e.g. monitor systems performance, data sorting, etc.

- E.g. text editors; sort utilities; file copy utilities; file maintenance utility; tracing and debugging; rename utilities. Others include utilities like delete, send, compare linker, loader, merge, etc.

SYSTEM DEVELOPMENT PROGRAMS

- Major examples of development programs include
  - *Programming languages and translators*
  - Programming editors and tools
  - CASE (Computer-Aided Software Engineering) packages.

PROGRAMMING LANGUAGES

- Refer to the languages in which computer programs are written and programming language has its own unique vocabulary, grammar, and uses.

- A programming language allows a programmer or end user to develop the set of instructions that constitute a computer program.

PROGRAMMING LANGUAGES

- Is a formal computer **language** or constructed **language** designed to communicate instructions to a machine, particularly a computer.
- **Programming languages** can be used to create programs to control the behavior of a machine or to express algorithms.

```
def add5(x):
    return x+5

def dotwrite(ast):
    nodename = getNodename()
    label=symbol.sym_name.get(int(ast[0]),ast[0])
    print '    %s [label="%s' % (nodename, label),
    if isinstance(ast[1], str):
        if ast[1].strip():
            print '= %s"];' % ast[1]
        else:
            print '"]'
    else:
        print '"];'
        children = []
        for  in n, childenumerate(ast[1:]):
            children.append(dotwrite(child))
        print ,'    %s -> [' % nodename
        for  in :namechildren
            print '%s' % name,
```

CATEGORIES OF PROGRAMMING LANGUAGES

- The machine languages
- The assembly languages
- High-level languages
- Fourth generation languages and
- Object-oriented languages

THE MACHINE LANGUAGES

- **Machine** code or **machine language** is a set of instructions executed directly by a computer's central processing unit (CPU).
- Each instruction performs a very specific task, such as a load, a jump, or an ALU operation on a unit of data in a CPU register or memory.

THE ASSEMBLY LANGUAGES

- An **assembly** (or assembler) **language**, often abbreviated asm, is a low-level programming **language** for a computer, or other programmable device, in which there is a very strong (generally one-to-one) correspondence between the **language** and the architecture's machine code instructions.

LANGUAGE TRANSLATOR PROGRAMS

- In order for the source code to be executed by a computer, it must be translated into fundamental machine instructions.
- Programming language translators are actually programs that translate other programs into machine language instruction codes that computers can execute.
- Major types of language translator programs include: assemblers, compilers and interpreters.

HIGH-LEVEL LANGUAGES

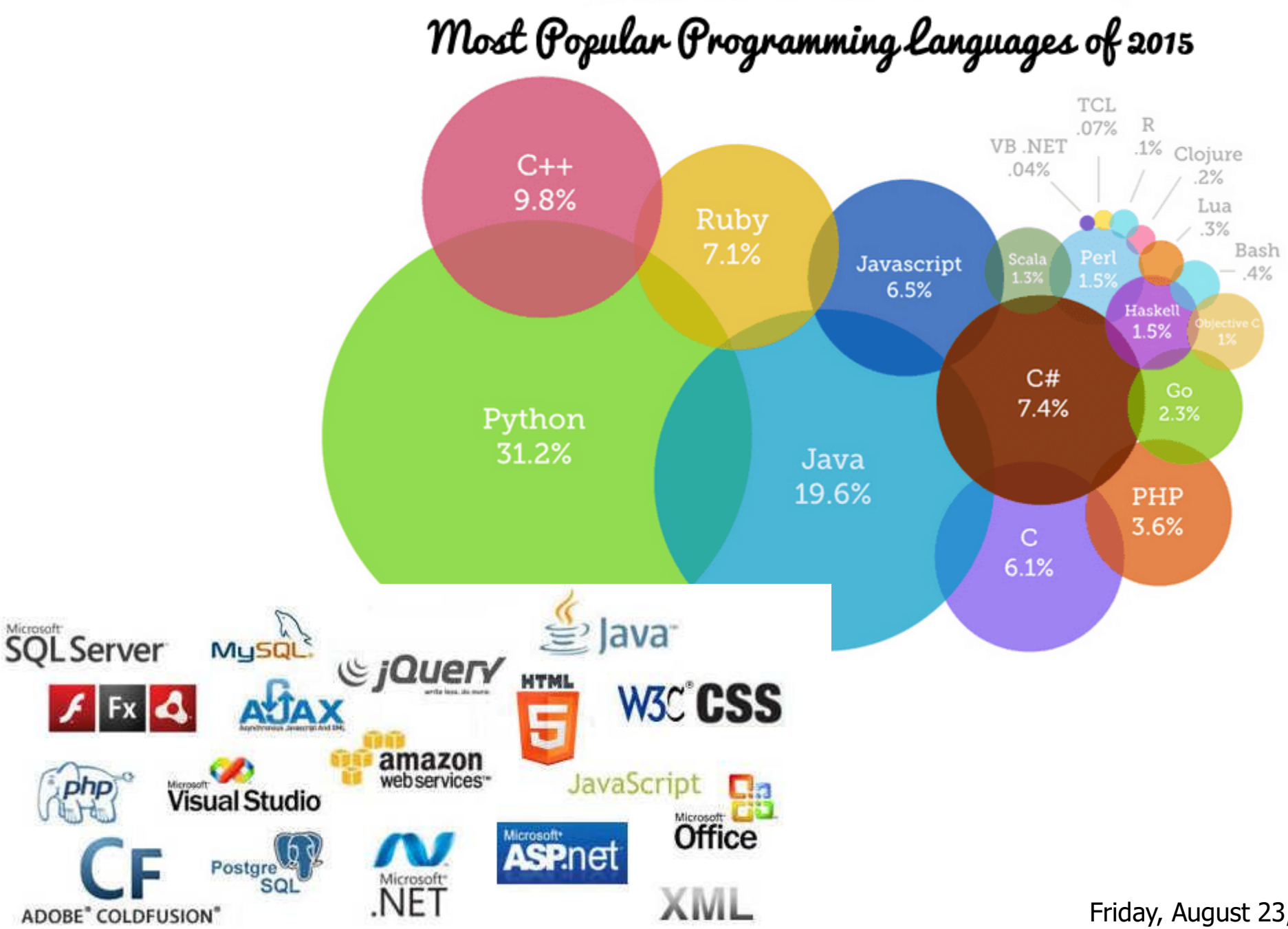
- **high-level language**. A machine-independent programming **language**, such as C, C++, Java, Perl and COBOL.
- It lets the programmer concentrate on the logic of the problem to be solved rather than the intricacies of the machine architecture such as is required with low-**level** assembly **languages**.

FOURTH GENERATION LANGUAGES

- A **fourth-generation** programming **language** (4GL) is a computer programming**language** envisioned as a refinement of the style of **languages** classified as third-**generation** programming **language** (3GL).

OBJECT-ORIENTED PROGRAMMING LANGUAGES

- **Object-oriented programming** (OOP) is a **programming language** model organized around **objects** rather than "actions" and data rather than logic. Historically, a program has been viewed as a logical procedure that takes input data, processes it, and produces output data.


Most Popular Programming Languages of 2015
C++
9.8%
Ruby
7.1%
Javascript
6.5%
Python
31.2%
Java
19.6%
C#
7.4%
C
6.1%
PHP
3.6%
Go
2.3%
Scala
1.3%
Perl
1.5%
Haskell
1.5%
Objective C
1%
Lua
.3%
Clojure
.2%
R
.1%
TCL
.07%
VB .NET
.04%
Bash
.4%
Microsoft SQL Server
MySQL
Java
jQuery
HTML
W3C CSS
AJAX
amazon web services
JavaScript
php
Microsoft Visual Studio
Microsoft Office
CF
ADOBE COLDFUSION
Postgre SQL
Microsoft .NET
Microsoft ASP.net
XML

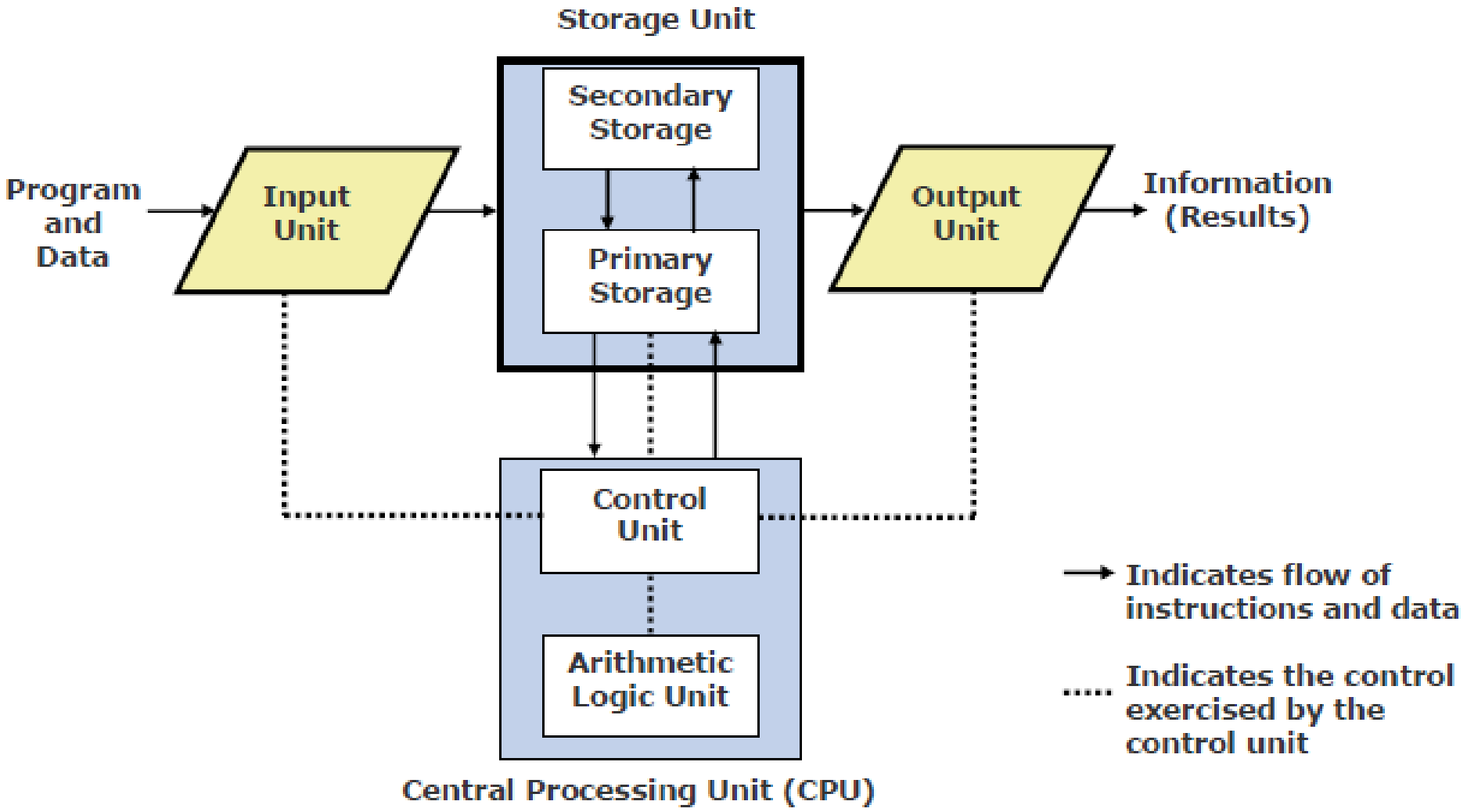
2.0 ARCHITECTURE OF THE COMPUTER

Architecture of a computer is a description of the structure of a computer system made from component parts

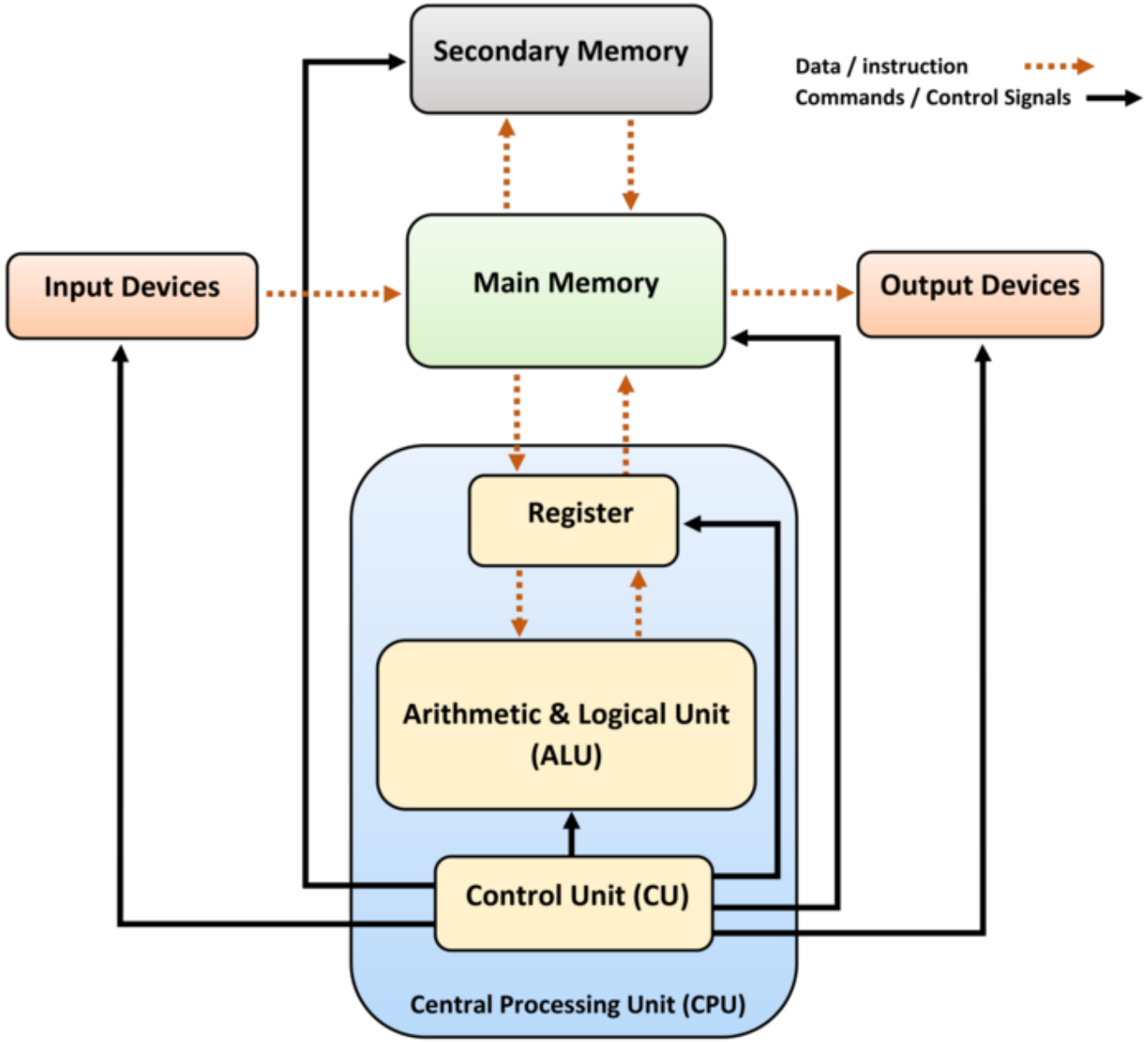
Computer architecture is concerned with balancing the performance, efficiency, cost, and reliability of a computer system.

- Three main subcategories of architecture of computer include:

1. **Instruction set architecture** (ISA): defines the machine code that a processor reads and acts upon as well as the word size, memory address modes, processor registers, and data type.
2. **Microarchitecture**: also known as "computer organization", this describes how a particular processor will implement the ISA.The size of a computer's CPU cache for instance, is an issue that generally has nothing to do with the ISA.
3. **Systems design**: includes all of the other hardware components within a computing system, such as data processing other than the CPU (e.g., direct memory access), virtualization, and multiprocessing.



Block diagram of a basic computer with uniprocessor CPU.



Block diagram of a basic computer with uniprocessor CPU.

2.0 ARCHITECTURE OF THE COMPUTER

A computer is a system of hardware devices organized according to the following system functions:

- Input devices / technologies
- Processor
- Main memory and secondary storage
- Output devices / technologies
- Communication devices

COMPUTER SYSTEM: INPUT

- An input device is used to enter data and instructions into the CPU.
- Some of the input devices of a computer system include keyboards, microphone, bar code reader, touch screens, pens, electronic "mice," optical scanners, and other peripheral hardware components that convert data into electronic machine-readable form.

OUTPUT TECHNOLOGIES

- These are devices used to send data out of the system in a variety of forms. Video displays and printed documents have been, and still are, the most common forms of output from computer systems.
- Output devices include video display units, speakers, printers, audio response units, and other peripheral hardware components specialized in this function.

COMMUNICATION DEVICES

- It refers to a hardware device capable of transmitting analog or digital signals over a telephone, other communication wire or wirelessly. They include but not limited to Modem, router, Hub, Witch, Mobile Phone etc.

network interface card

wireless network interface card

network access point transceiver

modem

COMMUNICATION DEVICES

- **Modem:** Device that converts digital signals into analog signals so that computers can communicate with each other over telephone lines.
- **Wireless network interface card:** Expansion card with an integrated antenna; it links a computer to a network access point transceiver via radio waves.
- **Network access point transceiver:** Device that links a computer network linked by cable and a computer fitted with a wireless network interface card.
- **Network interface card:** Expansion card that connects a computer to a computer network.

COMMUNICATION DEVICES

- **HUBS:** Refers to wiring concentrators that provide common connections among devices.
- **SWITCH:** Similar to HUB but rather make intelligent router decisions.
- **Bridge:** Networking devices that connect networks.
- **Repeater:** Connects two segments of the same network thus overcoming distance limitations of the transmission limitations. In other words, a repeater eliminates the effects of attenuation on the signal of an expanded/extended network.
- **Mobile Phone:** Wireless handheld device that allows users to make calls, send messages and multimedia content over the internet.

MAIN MEMORY

- The memory is the physical internal medium that holds data. Main memory is as vital as the processor chip to a computer system because it stores data and program instructions temporarily during execution.
- The two basic types are RAM and ROM.
  - RAM in microcomputers is "volatile" which means that the contents of the memory are erased when the computer's power is switched off.
  - ROM is "non-volatile" memory, which means that it's contents, do not disappear when the computer's power source is switched off.

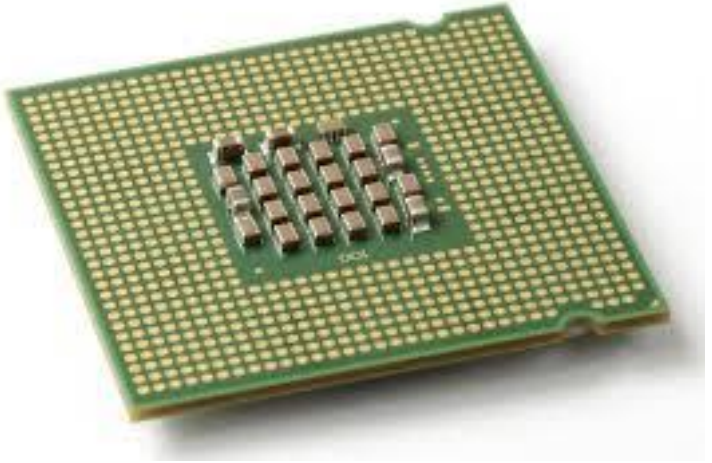
SECONDARY MEMORY

- Secondary memory is where **programs and data are kept on a long-term or permanent basis** therefore cost effective. Common secondary storage devices are the hard disk, memory sticks and floppy disks.
- Some of the characteristics of secondary memory include; the **hard disk** has enormous storage capacity compared to main memory.

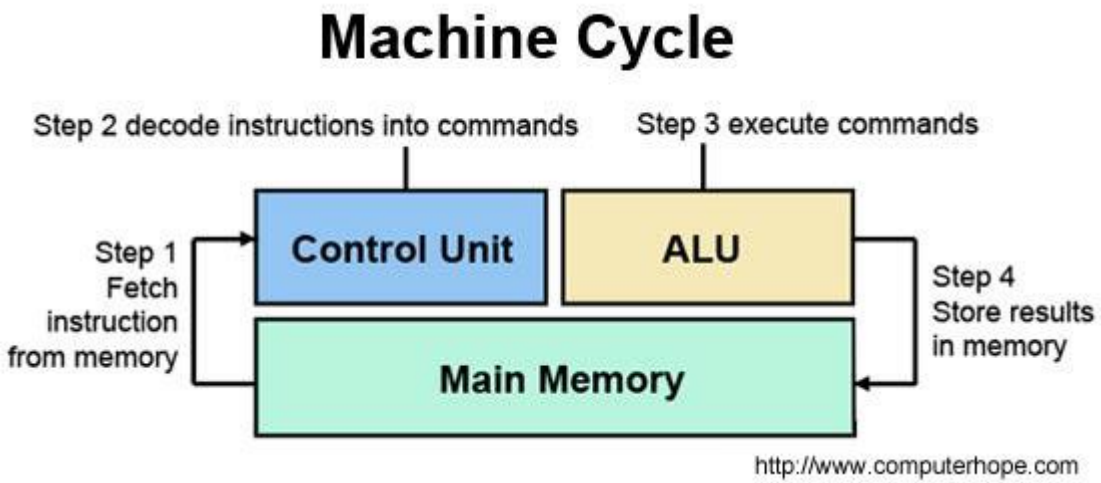
THE CENTRAL PROCESSING UNIT

- The CPU also referred to as the processor or microprocessor is the *brain* of any computer, and therefore, the most important part of the computer system. It carries out all the processing in the computer.
- The CPU itself consists of three main subsystems, namely; a sophisticated CU, large number of registers, and a sophisticated ALU.

PROCESSORS



COMPUTER COMPONENTS



ARITHMETIC LOGIC UNIT (ALU)

- The ALU performs the arithmetic and logic functions required in computer processing. The ALU contains the circuitry that performs data manipulation.
- This unit performs all mathematical and logical functions. Mathematical functions include multiplication, division, subtraction, addition and advanced mathematics such as logarithms, trigonometry & other specialized operations.

CONTROL UNIT

- The CU interprets computer program instructions and transmits directions to the other components of the computer system.
- The CU can be thought of as the "brain" of the CPU itself.
- The CU performs the tasks of fetching from memory the next instruction to be executed, decoding it by determining what is to be done, managing stored program execution and then storing results.

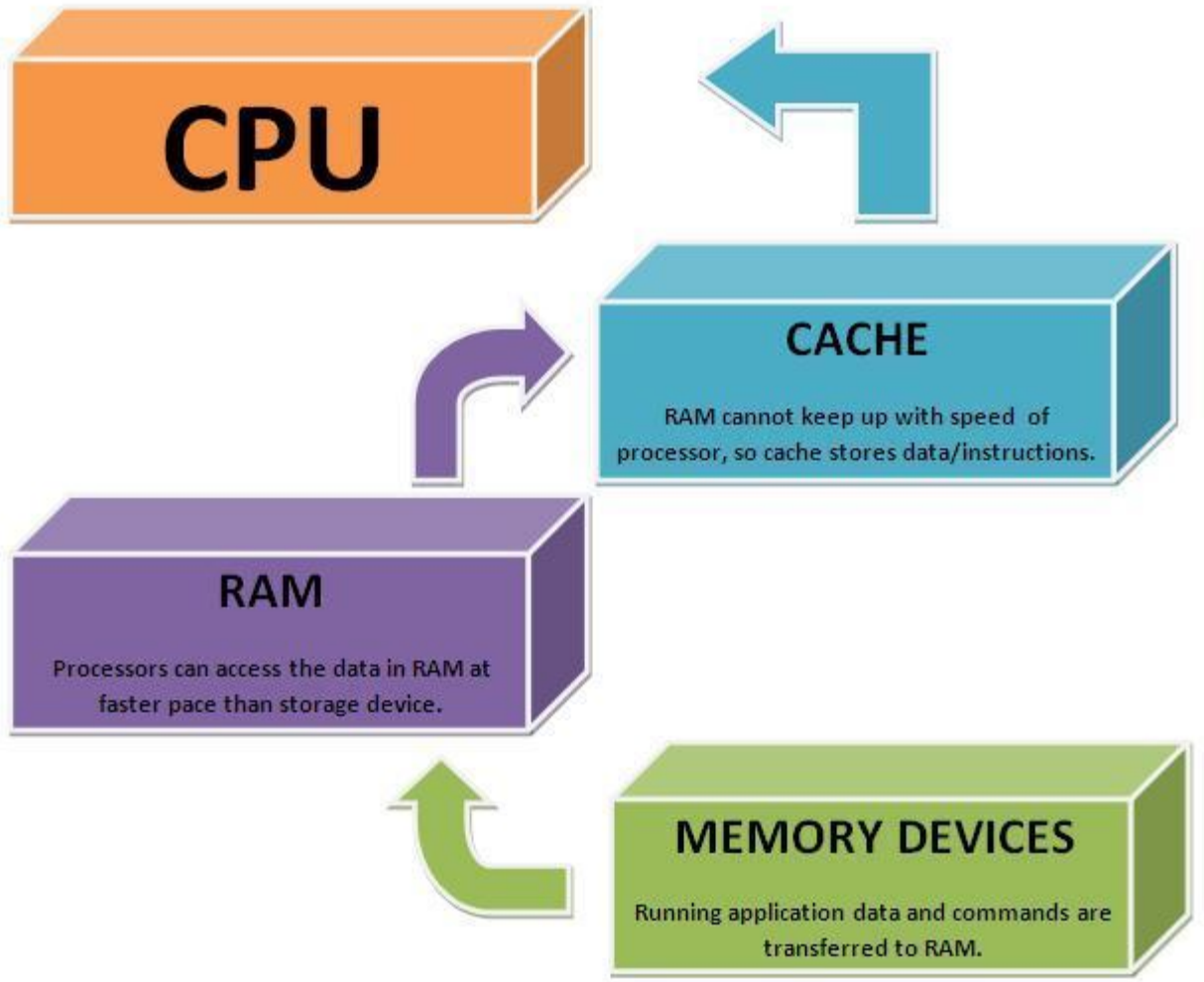
REGISTER & CACHE MEMORY

- The CPU also contains circuitry for devices such as **registers** and **cache memory**, used for high speed temporary storage of data and instructions.
- The registers are special purpose temporary storage locations. They hold data needed quickly or frequently prior to execution and stores information about status of CPU and currently executing program.

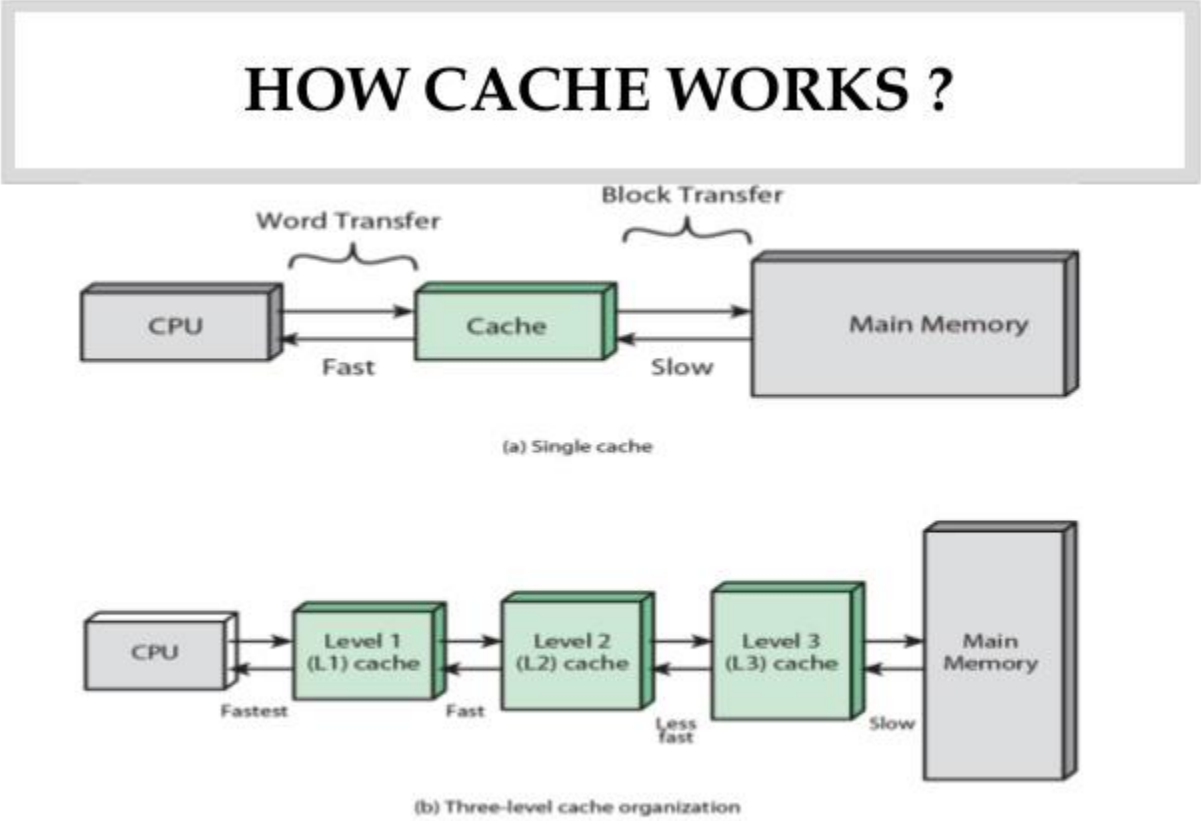
CACHE MEMORY

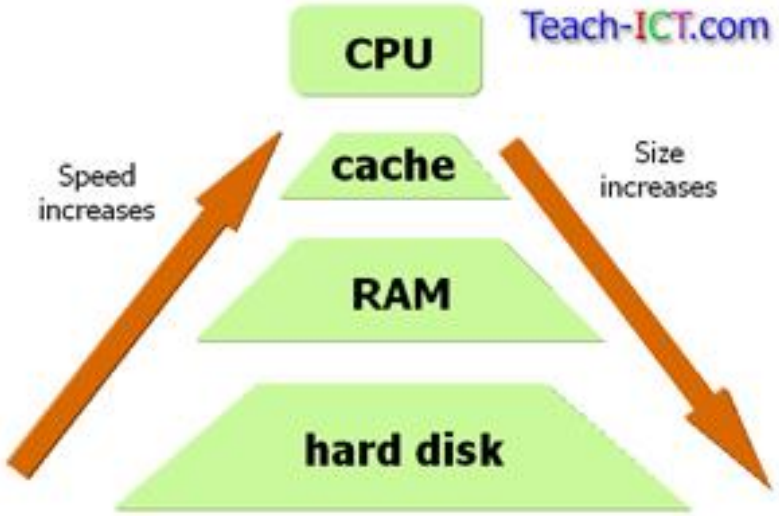
- Cache Memory on the other hand is used to reduce the time or energy required to access data from the main memory. The cache is a smaller, faster memory and stores copies of the data from frequently used main memory locations. Most CPUs have different independent caches, including instruction and data caches, usually organized in cache levels (L1, L2, etc.).

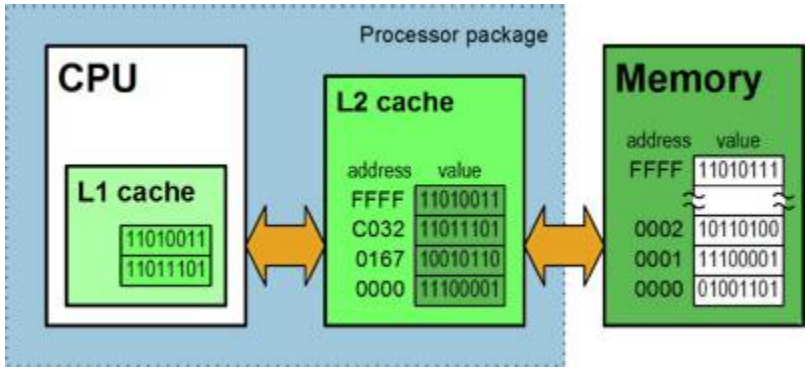
HOW THEY WORK

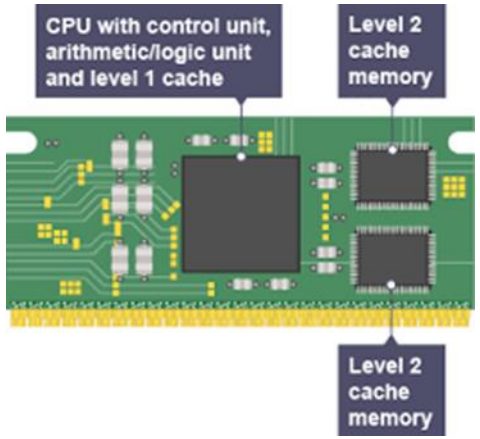


HOW CACHE WORKS



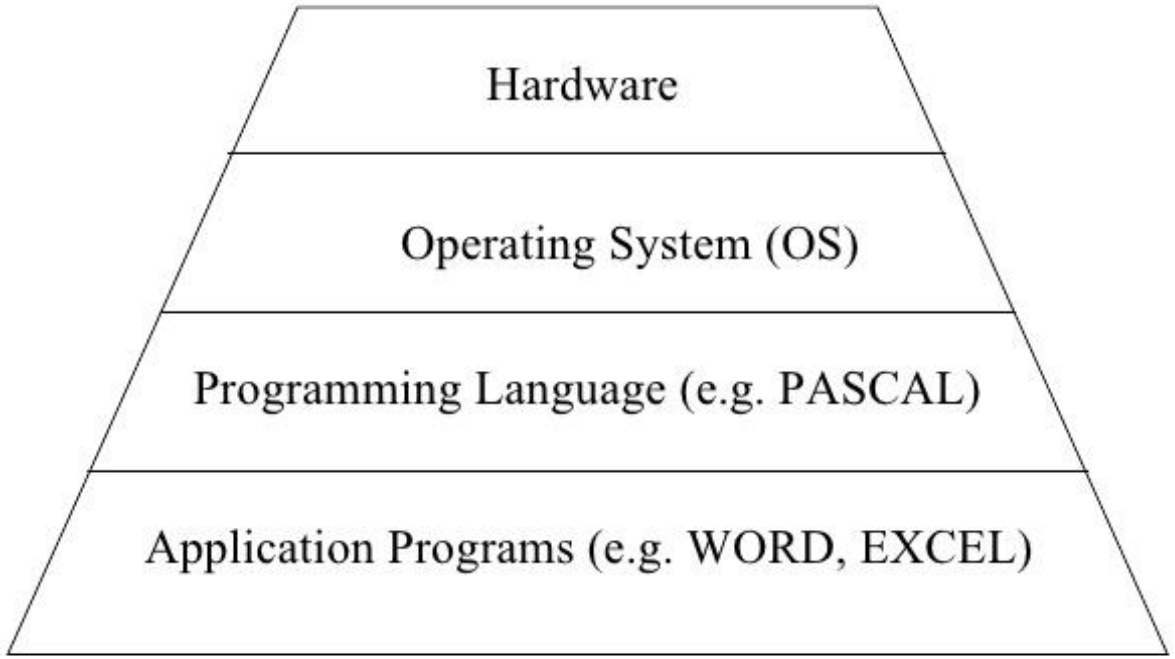




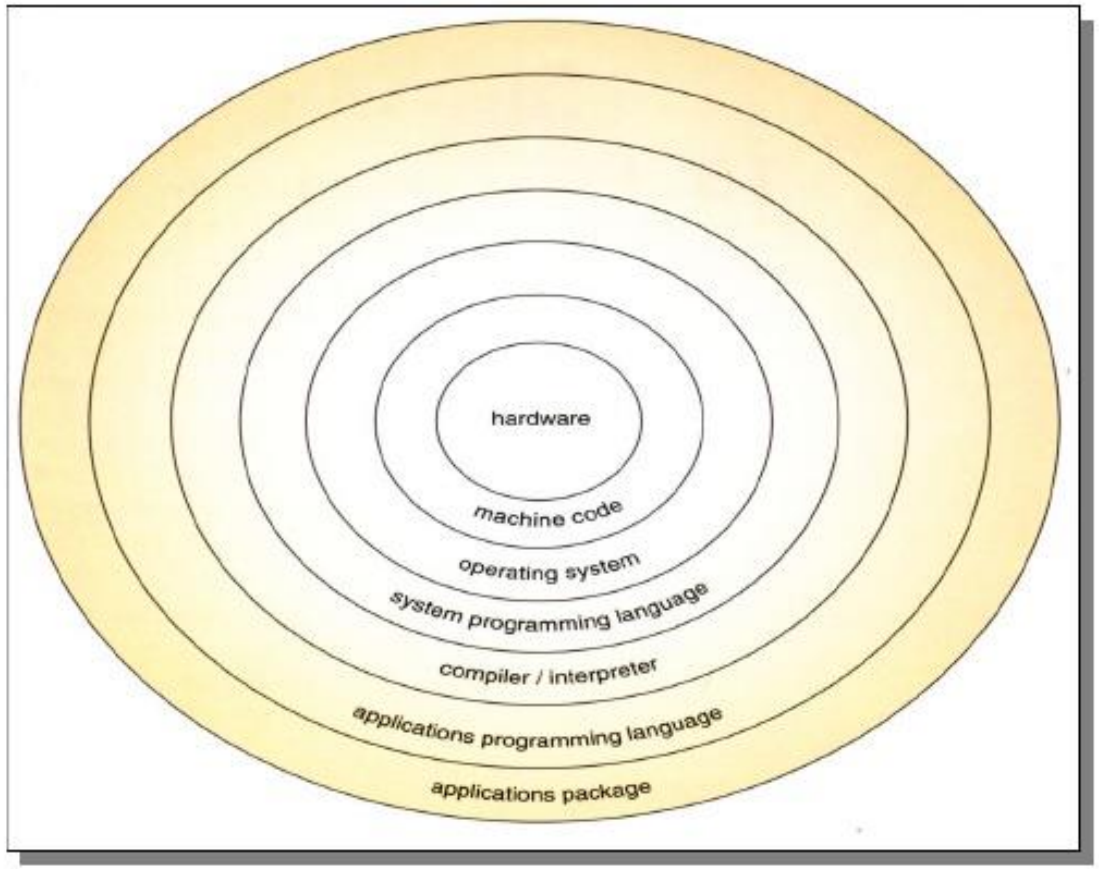


https://www.youtube.com/watch?v=cNN_tTXABUA.

Architecture of Computer System



Detail Layered View of Computer



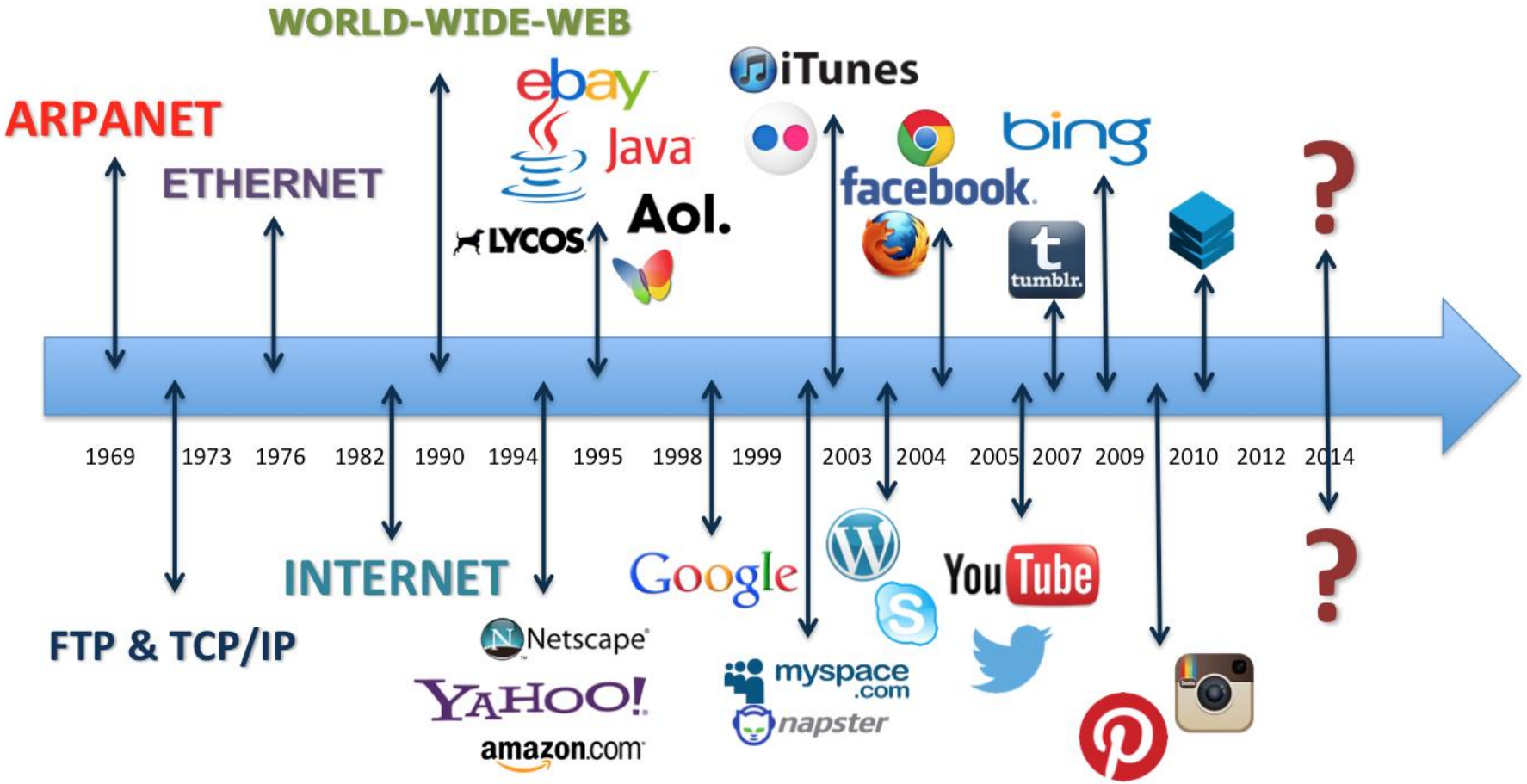
INTERNET DEFINITION (WIKIPEDIA)

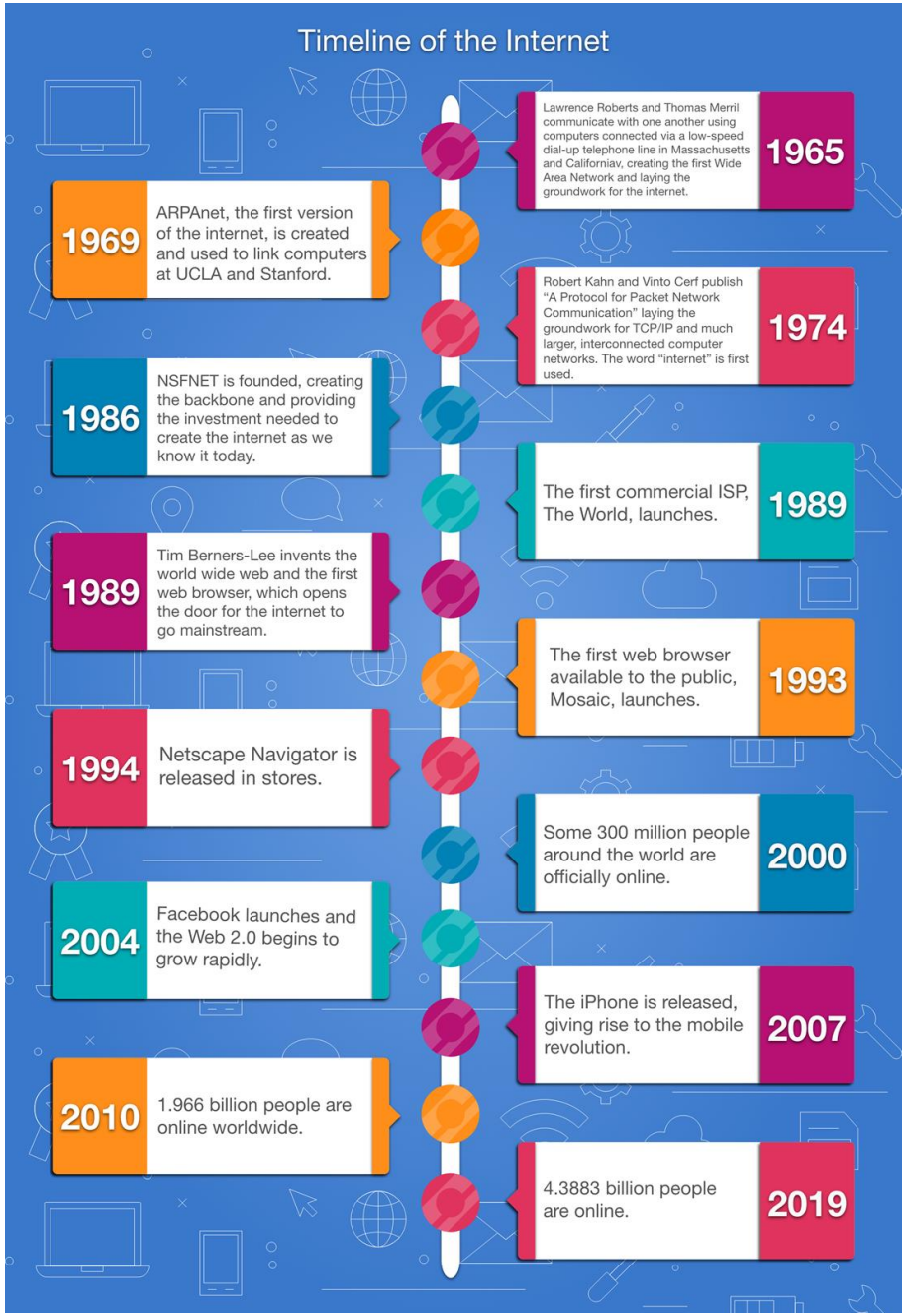
- The Internet is the global system of interconnected computer networks that use the Internet protocol suite (TCP/IP) to link billions of devices worldwide.
- It is a network of networks that consists of millions of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies.
- Internet is defined as an Information super Highway, to access information over the web.
- Internet is a world-wide global system of interconnected computer networks.

INTERNET DEFINITION CON'T

- The Internet carries an extensive range of information resources and services, such as;
  - Inter-linked hypertext documents
  - applications
  - World Wide Web (WWW),
  - electronic mail,
  - telephony,
  - peer-to-peer networks for file sharing

INTERNET TIMELINES/HISTORY

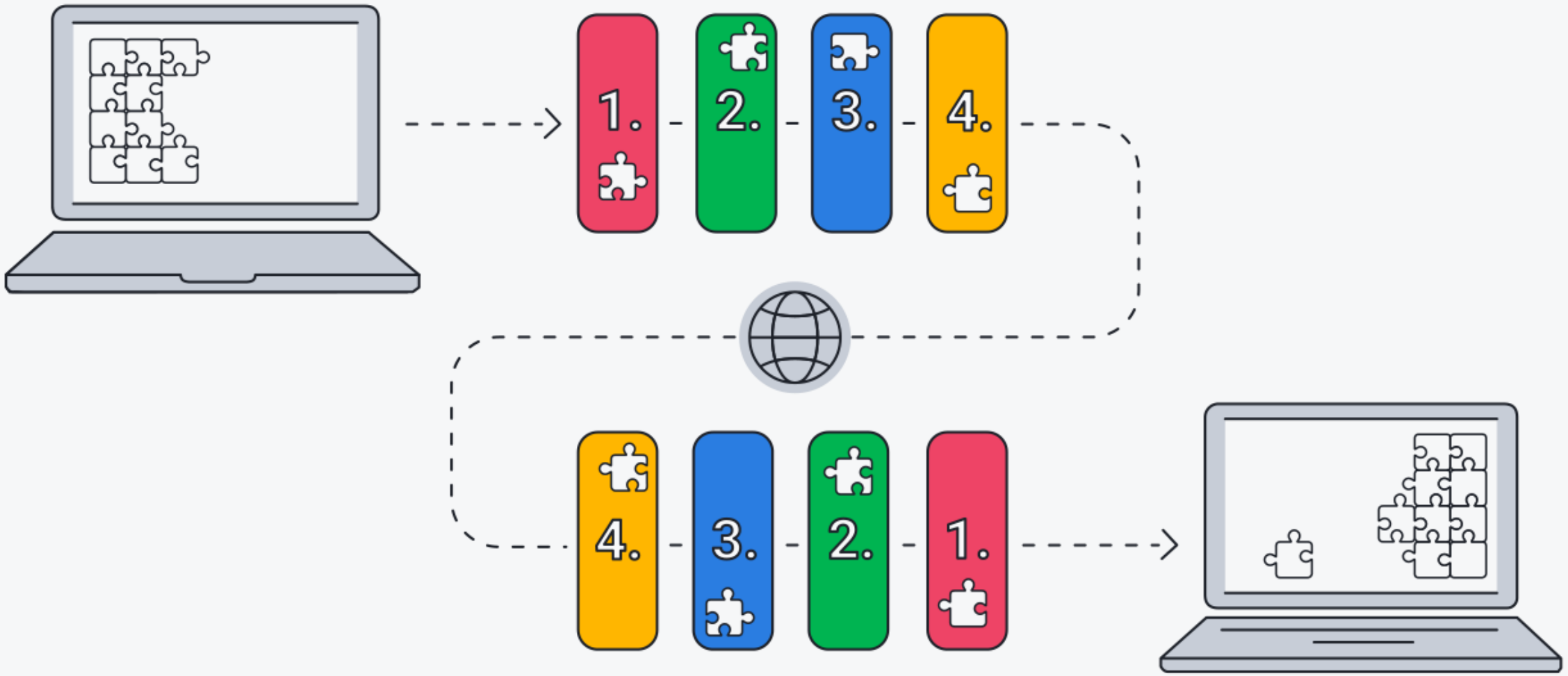



Timeline of the Internet
1965
Lawrence Roberts and Thomas Merril communicate with one another using computers connected via a low-speed dial-up telephone line in Massachusetts and Californiav, creating the first Wide Area Network and laying the groundwork for the internet.
1969
ARPAnet, the first version of the internet, is created and used to link computers at UCLA and Stanford.
1974
Robert Kahn and Vinto Cerf publish "A Protocol for Packet Network Communication" laying the groundwork for TCP/IP and much larger, interconnected computer networks. The word "internet" is first used.
1986
NSFNET is founded, creating the backbone and providing the investment needed to create the internet as we know it today.
1989
The first commercial ISP, The World, launches.
1989
Tim Berners-Lee invents the world wide web and the first web browser, which opens the door for the internet to go mainstream.
1993
The first web browser available to the public, Mosaic, launches.
1994
Netscape Navigator is released in stores.
2000
Some 300 million people around the world are officially online.
2004
Facebook launches and the Web 2.0 begins to grow rapidly.
2007
The iPhone is released, giving rise to the mobile revolution.
2010
1.966 billion people are online worldwide.
2019
4.3883 billion people are online.

INTERNET TECHNOLOGIES

- **TCP/IP**, or the Transmission Control Protocol/Internet Protocol, is a suite of communication protocols used to interconnect network devices on the internet.
- **TCP/IP** can also be used as a communications protocol in a private network (an intranet or an extranet).

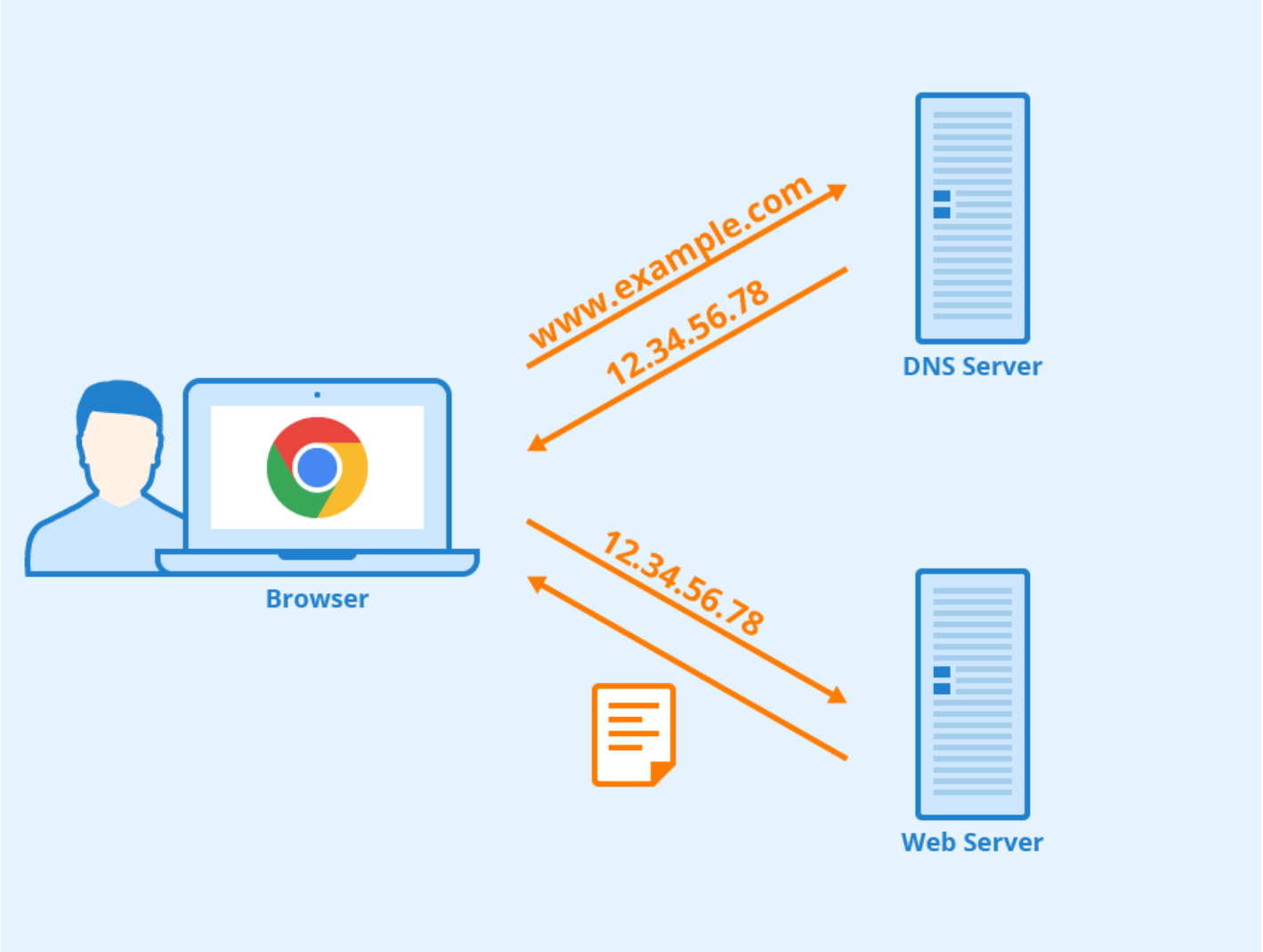
INTERNET TECHNOLOGIES



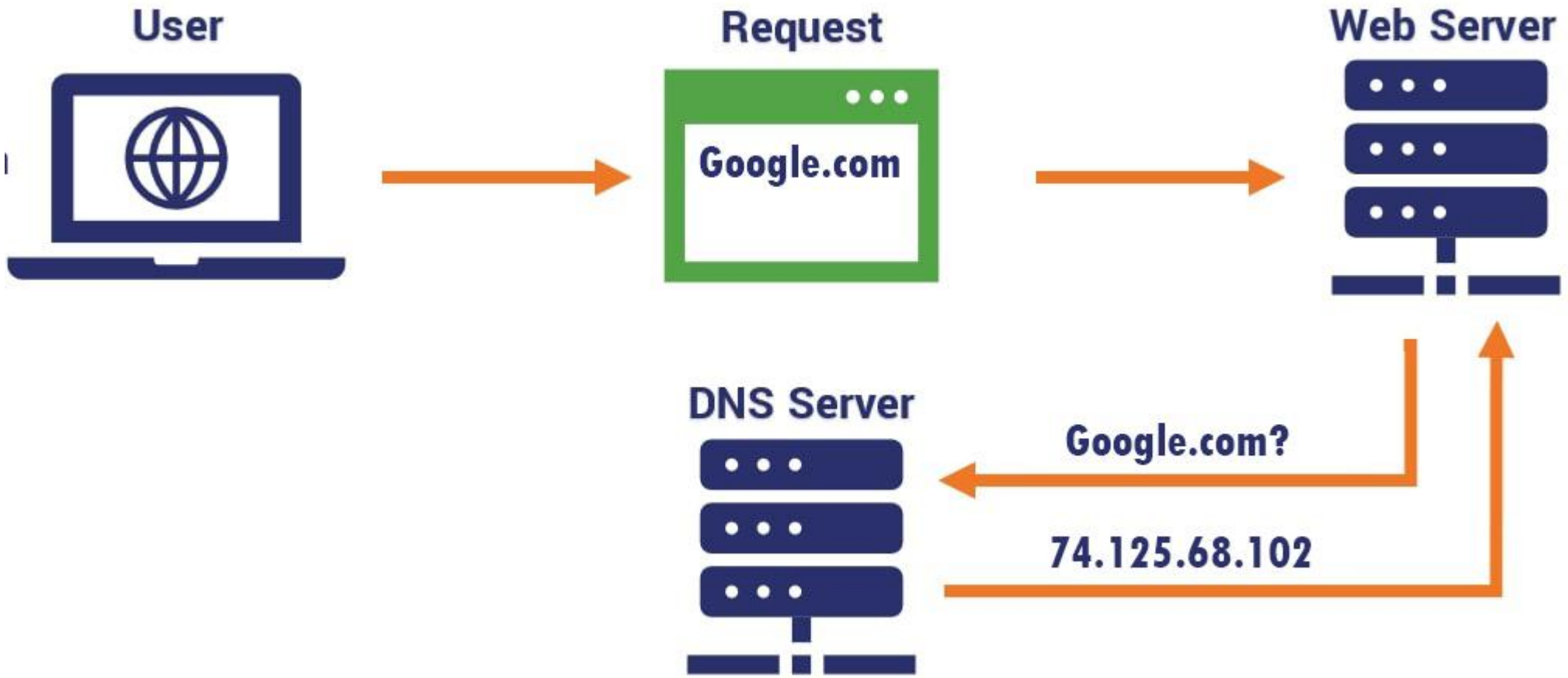
DNS: THE DOMAIN NAME

- **System** (DNS) is a hierarchical decentralized naming system for computers, services, or other resources connected to the Internet or a private network.
- It associates various information with domain names assigned to each of the participating entities

DNS: THE DOMAIN NAME



DNS: THE DOMAIN NAME



DNS

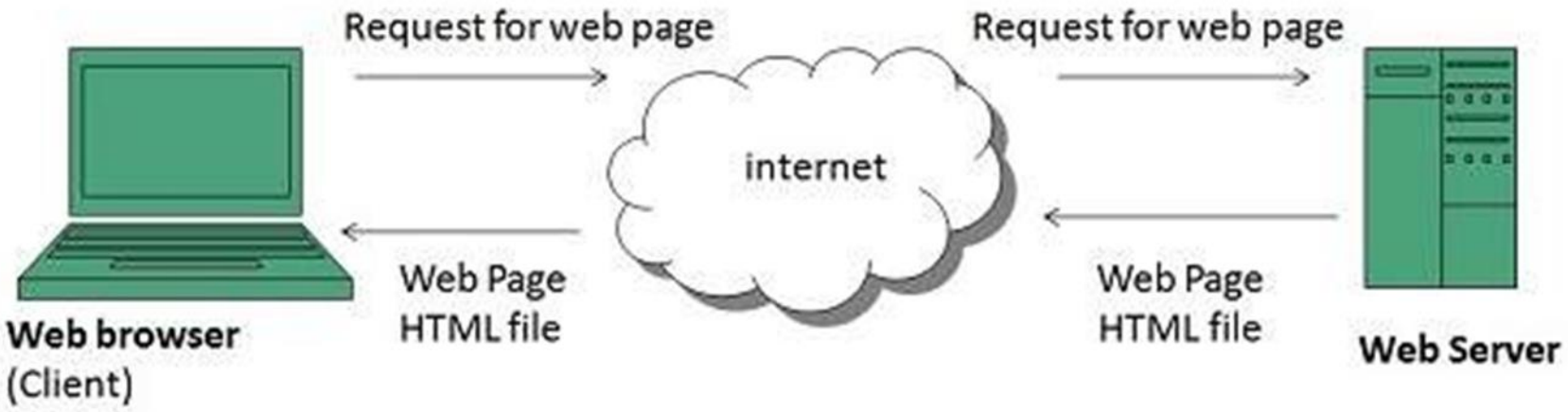
- For example, a DNS server will resolve aname **http://www.mubs.ac.ug** to a particular IP address (192.145.236.94) to uniquely identify the computer on which this website is hosted.
- Internet is accessible to every user all over the world.

DNS

- A special computer DNS (Domain Name Server) is used to give name to the IP Address so that user can locate a computer by a name
- Every computer in internet is identified by a unique IP address.
- IP Address is a unique set of numbers (such as 192.145.236.94) which identifies a computer location.

BROWSER,

- A **browser** is an application program that provides a way to look at and interact with all the information on the World Wide Web



BROWSER,

- A **browser** is an application program that provides a way to look at and interact with all the information on the World Wide Web

WWW OR WORLD WIDE WEB

- An information system on the Internet which allows documents to be connected to other documents by hypertext links, enabling the user to search for information by moving from one document to another.

SCRIPTING LANGUAGES ETC.

- A **scripting language** is a **programming language** designed for integrating and communicating with other **programming languages**. Some of the most widely used **scripting languages** are JavaScript, VBScript, PHP, Perl, Python, Ruby, ASP…

FORMS OF INTERNET - INTRANET

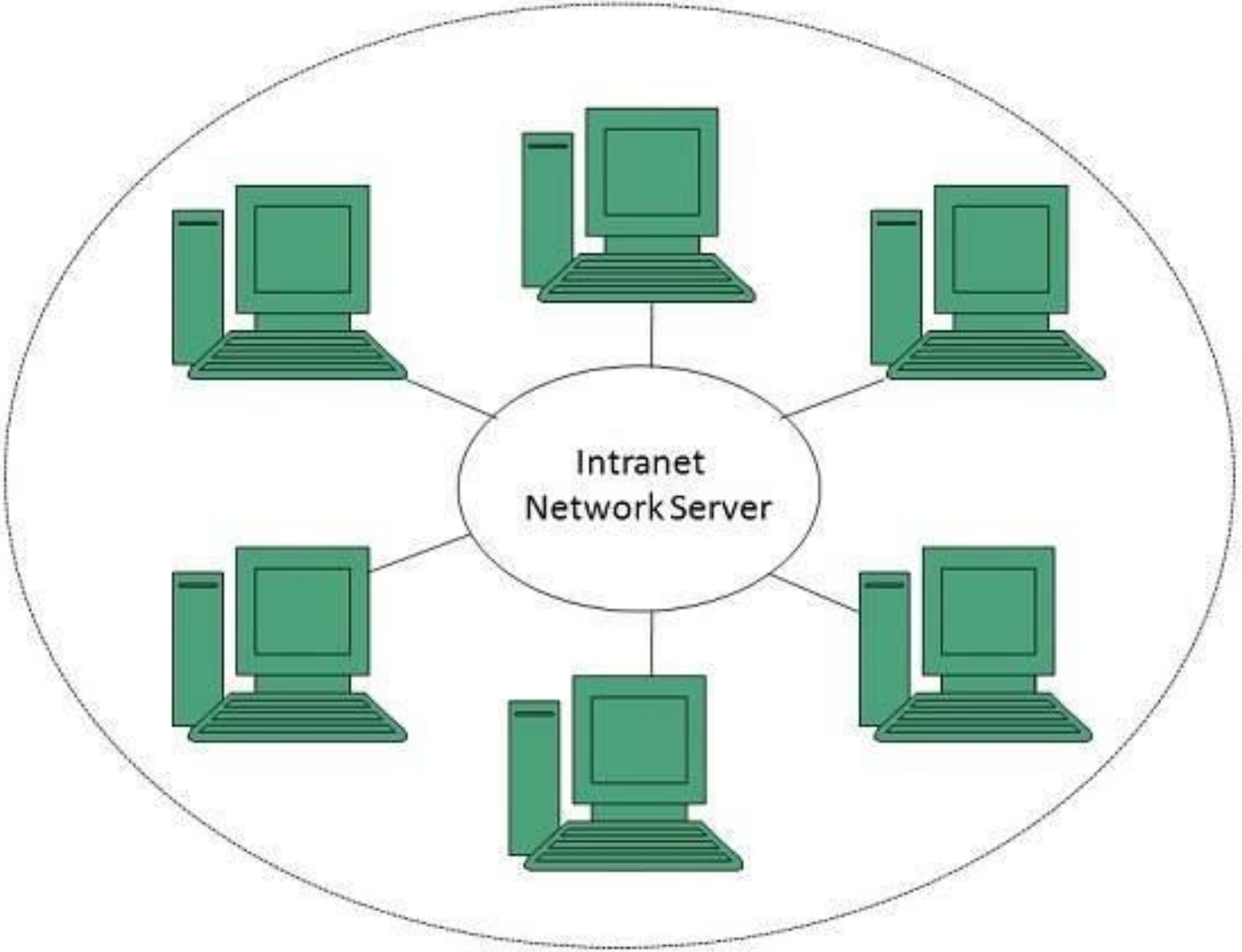
- Intranet is defined as private network of computers within an organization with its own server and firewall. Moreover we can define Intranet as:
  - Intranet is system in which multiple PCs are networked to be connected to each other. PCs in intranet are not available to the world outside of the intranet.

INTRANET CON'T

- An intranet is an internal internet, available to individuals within a specific organization.
- The intranet also refers to a closed community of users, often within an organization. Intranets are designed to be used for internal business purposes only.

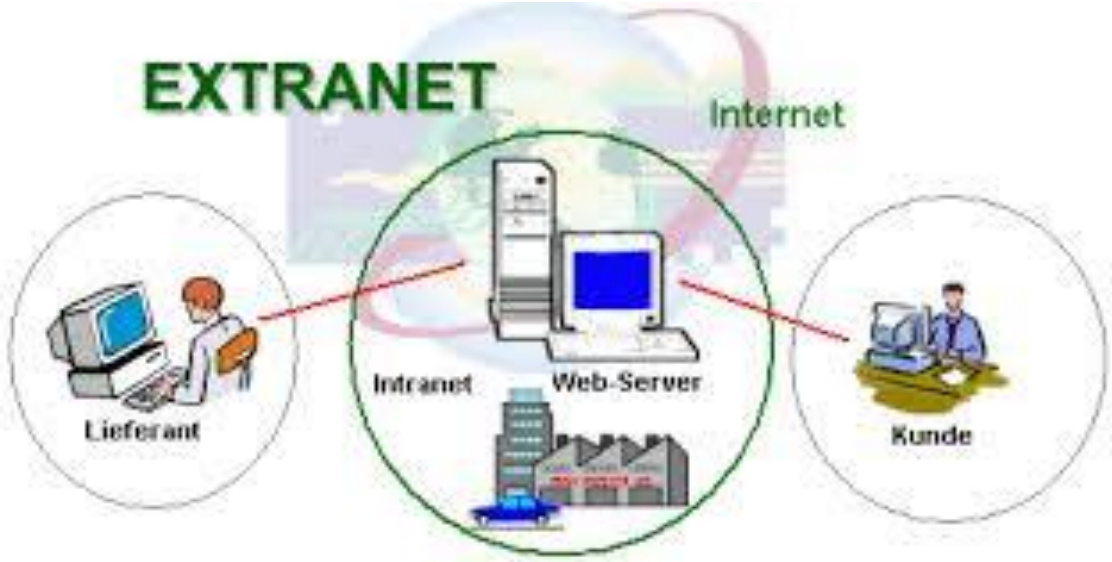
INTRANET CON'T

- Usually each company or organization has their own Intranet network and members/employees of that company can access the computers in their intranet.
- Every computer in internet is identified by a unique IP address.
- Each computer in Intranet is also identified by a IP Address, which is unique among the computers in that Intranet


Intranet
Network Server

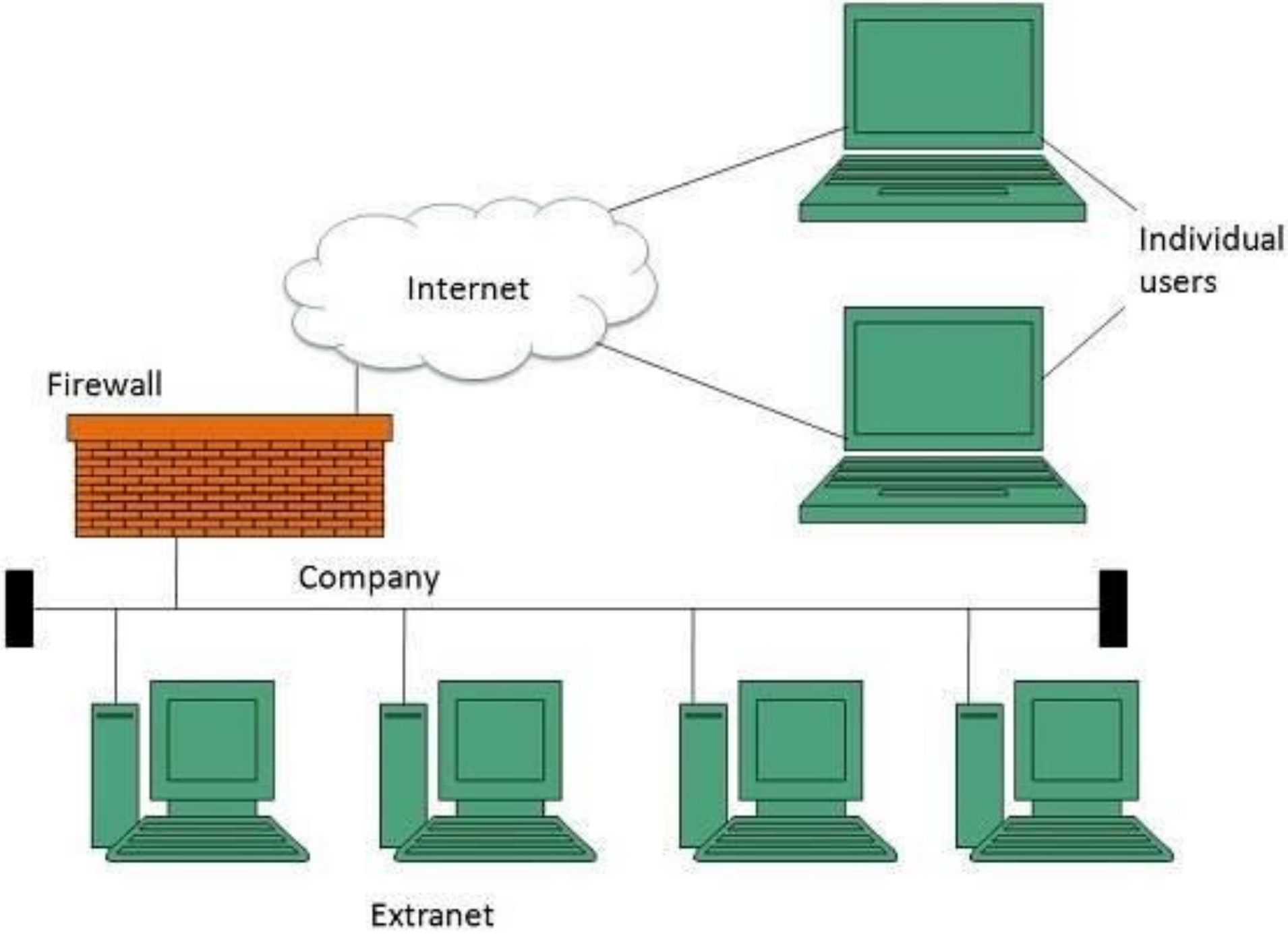
FORMS OF INTERNET - EXTRANET

- Extranet refers to network within an organization, using internet to connect to the outsiders in controlled manner. It helps to connect businesses with their customers and suppliers and therefore allows working in a collaborative manner.



EXTRANET CON'T

- An extranet is an extension of an organization's Intranet. The difference is that an extranet is accessible to selected people or groups outside the organization e.g. organization's suppliers, distributors and corporate customers.
- An individual can obtain a password authorization and then be routed to the organizations extranet to conduct transactions & obtain information not available to the public.


Internet
Individual
users
Firewall
Company
Extranet

VITAL INTERNET TECHNOLOGIES

- A reasonably powerful PC (preferably Pentium or similar) that has sufficient hard disk space on which to store files (at least 10GB storage capacity).
- A modem that works at a high transmission rate.
- Computer software/telecommunication program
- Telephone lines or points
- Internet Service Provider (ISP)

INTERNET APPLICATIONS

- Electronic mail or e-mail.
- Electronic conferencing.
- Electronic education / learning/ research.
- Electronic chart services.
- Electronic collaboration.
- Electronic medicine.
- Electronic shopping.
- Electronic entertainment.
- Electronic marketing/selling products or services.
- Electronic funds transfer/purchase products.
- Electronic banking.
- Electronic commerce
- E.t.c.

INTERNET BUSINESS OPPORTUNITIES

- Credit authorization at the point of sale using online POS networks.
- Credit inquiries can be made and answered in seconds.
- Desktop videoconferencing between a company and its business partners reduces expensive business trips, allows customers, suppliers, and employees to collaborate, thus improving the quality of decisions reached.
- Business-to-business e- Commerce website for transactions with suppliers and customers leads to fast, convenient services lock-in customers and suppliers.

INTERNET BUSINESS OPPORTUNITIES CONT'

- Use of the Internet and extranets to transmit customer orders from has led to the provision of better customer service by reducing delay in filling orders.
- Transmission of customer orders also improves cash flow by speeding up the billing of customers.
- Generating new revenue from online sales or electronic commerce applications is a growing source of business value.

INTERNET BUSINESS OPPORTUNITIES CONT'

- Attract new customers via Web marketing and advertising and online sales with innovative products.
- Increase the loyalty of existing customers via improved Web customer service and support.
- It fosters communication interactively with customized information and services to individual customers.

INTERNET BUSINESS OPPORTUNITIES CONT'

- Reduced costs and cost savings through online sales and customer support.
- Develop new Web-based markets and distribution channels for existing products.
- Develop new information-based products accessible on the Web.

THANK YOU