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Introduction.

A computer is a programmable machine that retrieves, processes and stores information. The word "computer" was firstly given to people who executed numerical calculations using power-driven calculators. The word was then given to power-driven devices as they began substituting the human computers. Computers are now electronic machines that receive information (input), process that information, generate output and store (storage) the outcomes. Many computers depend on a binary structure, which utilizes two variables (0 and 1), to complete jobs such as calculating algorithms, storing information and presenting information.

Computers come in several different sizes and shapes, from handheld devices (smartphones) to supercomputers. The very powerful computers can execute very complex functions like simulating nuclear weapon experimentations and forecasting the change of climate.

Figure 1 below shows a simple computer.

Figure 1

Literature Review.

When we study the various facets of computers and computing, it is vital to know about the history of computers. Human used stones, sticks and bones as counting apparatuses before computers were created. Many computing gadgets were formed as technology developed

and the human intelligence advanced over time. We look at a few of the early-life computing machines used by humankind below.

1800s: A French inventor and merchant, Joseph Marie Jacquard developed a loom that utilized punched wooden cards to knit fabric designs automatically. Early computers used punch cards like these.

1820s: Charles Babbage, an English mathematician developed of a steam-powered calculating device that was able to calculate tables of numbers.

1840s: An English mathematician Ada Lovelace and poet Lord Byron's daughter, inscribed the world's first computer software.

1890s: Herman Hollerith designed a punch-card system that assisted compute the 1890 U.S. Census. This device spared the U.S. taxpayer approximately $5 million and the government some years of calculations. Hollerith later established a company that eventually became IBM.

Early 20th Century

Early 1930s: Vannevar Bush invented and built the Differential Analyzer, the first mass automatic general purpose mechanical analog computer, at the Massachusetts Institute of Technology.

Late 1930s: A professor of mathematics and physics, John Vincent Atanasoff at Iowa State University, submitted a grant suggestion to create the first electric-only computer, without utilizing cams, gears, shafts or belts.

Late 1930s: The Hewlett Packard Company was started by Bill Hewlett and David Packard in Palo Alto, California.

1940s: Atanasoff and Clifford Berry, developed the first digital electronic computer in the U.S., called the Atanasoff-Berry Computer (ABC). This manifested the first time a computer was able to store data on its primary memory and was capable of executing one action every 15 seconds.

Late 20th Century

1950s: Grace Hopper established the first computer language, that eventually became known as COBOL (COmmon, Business-Oriented Language).

1950s: John Backus and his group of programmers at IBM published a paper telling their newly created FORTRAN programming language.

1950s: Robert Noyce and Jack Kilby showed the integrated circuit, identified as the computer chip.

1960s: Douglas Engelbart released a model of the modern.

1960s: Dennis Ritchie, Ken Thompson and a team of developers at Bell Labs created UNIX OS that made large-scale networking of various computing systems, including the internet, practical.

1970s: A group of IBM engineers led by Alan Shugart created the floppy disk permitting information to be shared between different computers.

1970s: A member of the research staff for Xerox, Robert Metcalfe, developed Ethernet for linking multiple computers and other hardware.

1970s: After the successfully writing a software using the new BASIC language, Paul Allen and Bill Gates created their own software company, Microsoft.

1970s: Steve Wozniak co-found Apple Computer and Steve Jobs unveiled Apple I, the first computer with a one circuit board and ROM.

1980s: "Acorn," IBM's first PC, was released onto the market. It used the MS-DOS OS from Microsoft.

1980s: The Apple Lisa, was the first personal computer to have a GUI. It also included a drop-down menu and icons.

1980s: Microsoft released Windows

1990s: Larry Page and Sergey Brin designed the Google search engine at Stanford University.

21st Century

2000s: macOS was released by Apple.

2000s: AMD's Athlon 64, the initial 64-bit processor for PCs, was released to clients.

2009: Microsoft launched Windows 7.

2015: Apple delivered the Apple Watch. Microsoft delivered Windows 10.

2016: The initial reprogrammable quantum computer was built.

Operating Systems.

Examples of OSs include Microsoft Windows OS, Google's Android OS, Apple macOS, Linux Operating System and Apple iOS. Apple macOS is runs on Apple computers like the Apple Macbook Pro, Apple Macbook and Apple Macbook Air. Microsoft Windows OS is found on many personal computer platforms from makes like HP, Dell and Microsoft itself. Linux is an open-source OS that can be altered by users, not like those from Microsoft or Apple.

Microsoft Windows Operating System

This is an operating system that was created by Microsoft Cooperation. It is one of the most familiar operating systems globally for office and home computers. Microsoft Windows OS is a proprietary operating system, which means that the company theorized, designed, established and now sells this OS. It uses a graphical user interface (GUI). It allows users to watch videos, save information, execute applications, connect to the Internet and play games. The original version of Microsoft Windows is version 1.0 and was release in the early 1980s. Microsoft Windows is presented in numerous flavors, including Windows XP, Vista, Windows 95, Windows 7, 8, 10, 11, and 12. Efforts to use varieties of the Windows OS for smartphones have remained less fruitful even though some tablets use Windows 10.

Apple macOS.

One-on-one in the race with Microsoft Windows is the Apple's macOS. macOS is also a proprietary operating system. It is not intended to be tweaked or altered by users. Macintosh and Apple computers run on the proprietary macOS and OS X system. The original of which was announced about 20 years ago. The Apple/Mac and macOS products are also recognized and adored by their operators for effortlessness of use and constantly improving user experience. A simple desktop interface, fast processing speeds and a variety of supportive resources make operators thrilled about macOS. Numerous users enjoy the instantaneous connection with their mobile phone hardware and computers, and appreciate the absence of hackers and bugs that Apple operating systems are known for.

Linux Operating System.

Linux operating system was built by Finnish programmer Linus Torvalds in the early 1990s. Linux is unlike Apple and Windows in that it is not a proprietary software but an open-source operating system. This means anyone can alter and distribute it. Linux is free and existing in numerous different open-source versions. Linux is popular since it is customizable and offers a variety of choices to those who understand how to use it. A preferred of numerous programmers, Linux is broadly used on commercial and scientific servers, plus cloud computing surroundings. Linux is a perfect choice if you know how to tailor and work with operating systems.

The Computer System.

A computer is an electronic gadget that operates data or information. It has the capability to store, retrieve and process information. It does this through hardware, software, input, output and storage devices.

Hardware - these are all the physical parts of a computer like the keyboard or mouse. It also consists of all of the computer's internal parts that are tangible.

Software - is any set of commands (program) that tells the hardware what to do and how to do it like the web browsers word processors and games.

Input devices - any hardware device that directs information to a computer, letting a user to intermingle with and control it. The most generally used or main input devices are the keyboard and mouse. However, there are additional devices that input information into a computer.

Output devices - any device that accepts information from a computer, typically for display, physical reproduction or projection. Printers and monitors and are two main computer output devices commonly used.

Storage Devices - any hardware that is able to hold data either permanently or temporarily. There are two kinds of storage devices: a main storage device, like the RAM, and a secondary storage device, such as a hard drive.

Protecting Information and Hardware.

Because businesses are more reliant on on computers than ever before, they need to guard information and devices from computer crime and natural disasters. Kinds of computer criminal activities include illegal access and use, malicious damage, software piracy and computer viruses. To protect IT properties, businesses should formulate written security procedures. They can use technology like firewalls, virus protection and staff training in proper security measures. Steps must also be taken to protect client's personal confidentiality rights.

Securing your computer when on the web.

Keeping the computer protected helps to evade direct hacking efforts intended to steal your personal data and malware. Here are some ways that can assist decrease online risk when using a computer on the web.

Usage of a firewall - Windows has an inbuilt firewall which is automatically turned on.

All software must be kept up to date – Ensure that on automatic updates is turned on.

Usage of current antivirus software - Computers running on Windows now have Windows Defender Security Center or Windows Security already installed on them.

Ensure that passwords are protected and well-chosen.

Never open doubtful attachments or click uncommon links – These may be in email, posts, tweets, messages, online ads and may mask themselves as trusted and known sources.

Surf the web safely - Avoid visiting websites that have potentially illicit substance.

Stay away from pirated material - Avoid downloading or streaming movies, downloading books, music or software that do not come from reliable sources. They might have malware.

The Internet.

This is a group of computers linked by network wires or satellite links. Rather than joining all the computers to the internet, individual computers in a business are usually linked in a local area network (LAN). One node on this LAN is physically linked to the Internet. Therefore, the Internet is a network of networks. There are lots of computing gadgets that are linked to this network either for a short duration or permanently. These gadgets run network software that communicate through fiber optic, copper wires, radio or satellite transmission.

The Internet network is supplied by Internet Service Providers (ISP). These companies commit computers to act as servers making material (like e-mail or Web pages) available to the Internet users.

One can look at the formation of the Internet as having a core and an edge. The edge consists of host systems that provide a service through server applications, run software or client applications. A network of routers is at the core of the Internet.

Data and Network Communications

Data Communication is as a method in which more than one device transfers data to each other and for exchanging resources. It is an act or process in which data can be sent or received. A network of computers is an interlinked group of independent computers. Independent means no computer can control, stop or start another computer. The physical link between networked computing gadgets is created using either wireless media or cable (wired) media.

Components of Data Communication

Message: - this is a piece of data that is to be conveyed from one user to another. It can be an audio file, a text file, a video file, etc.

Sender: - this is just a gadget that sends information. It could be a mobile telephone, computer, video camera, laptop etc.

Receiver: - this is the device that gets the messages.

Communication Channels: - these are the medium that links two or numerous communicating devices. Devices can be linked by either wireless media or wired media.

Protocol: - Set of rules guiding the transfer of data.

Network Physical Structures.

Even though there are many ways of connecting electronic communicating devices, the common forms of networks comprise LAN (Local Area Network), WLAN (Wireless Local Area Network), WAN (Wide Area Network) and MAN (Metropolitan Area Network)

Local Area Network

It is a group of computers and associated devices that share a mutual communications link or wireless link to a server or a domain. A LAN usually covers a small physical area such as an office or a commercial formation. It can go up to 1 KM radius.

Wide Area Network

This network covers a huge terrestrial area. A WAN links dissimilar smaller networks, including LANs and metro area networks. This guarantees that computers and users in one site can communicate with users and computers in other sites.

Metropolitan Area Network

This is similar to a local area network but spans a complete town or campus, or some other urban or organizational region. MANs are designed by joining several LANs. MANs are bigger

than LANs but smaller than WANs. They are naturally very competent and can offer fast communication through fast carriers, such as fiber optic cables.

Network topology is the representation description of the arrangement of the logical elements and physical of a communication network. It is the arrangement or layout with which computer structures or network devices are linked to each other in order for them to exchange information.

Bus network topology

It is also known as backbone network topology. This layout joins all devices to a core cable via drop cables. This network topology is just simple, less cable required thus easy to install.

Mesh network topology

A host is linked to one or multiple hosts. This topology has hosts in point-to-point linking with every other host or may also have hosts which are in point-to-point linking to few hosts only.

Ring network topology

Two point-to-point links attach a machine to the two machines located on any side of it forming a ring of devices. When one device tries to communicate or send message to a device which is not next to it, the data journeys over all intermediate devices.

Star network topology

The most common network topology joins each device in the network to a hub in the center. Devices can only talk with each other via the central hub. The hub device can be a hub, repeater, switch, bridge or router.

Hybrid network topology

This a grouping of two or more topologies.

Tree network topology

This topology involves of a parent-child order in which star networks are inter-linked via bus networks. It is also known as Hierarchical Topology.

Office Techniques.

Microsoft Office is a powerful package that aids release the greatest ideas, stay linked on the go and get things completed.

Microsoft Word - This is a full-featured word editing application for Mac and Windows operating systems.

Microsoft Excel – This is a spreadsheet application that features graphic tools, calculation tools, macro programming language and pivot tables help for Windows and Mac operating systems.

Microsoft PowerPoint – This is a presentation application for Windows and Mac operating systems.

Microsoft Outlook - It is an email application.

Microsoft Publisher - This is a desktop publishing application for Windows operating systems.

Microsoft Access - It is a database administration solution for Windows operating systems

Databases

A database is an ordered group of structured data or information stored electronically in a computer. It is generally managed by a database management system (DBMS).

Information in the common kinds of databases in operation today is naturally modeled in rows and columns in a sequence of tables to make processing and data querying effective. There are four main kinds of DBMSs namely Network, Hierarchical, Relational and Object-Oriented. The most commonly used DBMS is the relational model that keeps data in table presentations. It uses SQL as the standard query language Most databases utilize structured query language (SQL) for querying and writing data. SQL is a programming language utilized by almost all relational databases to manipulate, query and define data, and to offer access control.

Conclusion.

Nowadays, computers do tasks that used to be difficult much simpler. For example, one can type a letter in a word processor, modify it anytime, print copies, spell check and send it to someone anywhere in the world within seconds. All these actions would have taken someone days or months to accomplish before. The improvement of technology permitted ever more-sophisticated devices by the 20th century and computers turn out to be bigger and very powerful. More lately, virtualization transformed how we think of software and hardware setups. A current computing system may not contain of a part of hardware itself, it may instead contain of a virtual machine or a virtualized computer system that utilizes resources from a grid to function.

Bibliography

https://www.computerhope.com/jargon/c/computer.htm Date: 02/07/2022

https://edu.gcfglobal.org/en/computerbasics/basic-parts-of-a-computer/1/

https://www.guru99.com/introduction-to-database-sql.html. Richard Peterson. Date: June 4, 2022

https://opentextbc.ca/businessopenstax/chapter/protecting-computers-and-information/

https://www.scienceandmediamuseum.org.uk/objects-and-stories/short-history-internet. Date: 3 December 2020

https://support.microsoft.com/en-au/windows/keep-your-computer-secure-at-home-c348f24f-a4f0-de5d-9e4a-e0fc156ab221