**Resume History of Computers**

* 1. **Electronic Computers Then and Now**

First generation: 1937 – 1946 - In 1937 The first electronic computer was built in the late 1930s by Dr. John Atanasoff and Clifford Berry at Iowa State University. Atanasoff designed his computer to assist graduate students in nuclear physics with their mathematical computations. Other developments continued until in 1946 the first general– purpose digital computer, the Electronic Numerical Integrator and Computer (ENIAC) was built. It is said that this computer weighed 30 tons, and had 18,000 vacuum tubes which was used for processing. When this computer was turned on for the first time lights dim in sections of Philadelphia. Computers of this generation could only perform single task, and they had no operating system.

These early computers used vacuum tubes as their basic electronic component. Technological advances in the design and manufacture of electronic components led to new generations of computers that were considerably smaller, faster, and less expensive than previous ones.

Second generation: 1947 – 1962 - This generation of computers used transistors instead of vacuum tubes which were more reliable. In 1951 the first computer for commercial use was introduced to the public; the Universal Automatic Computer (UNIVAC 1). In 1953 the International Business Machine (IBM) 650 and 700 series computers made their mark in the computer world. During this generation of computers over 100 computer programming languages were developed, computers had memory and operating systems. Storage media such as tape and disk were in use also were printers for output.

Third generation: 1963 - present - The invention of integrated circuit brought us the third generation of computers. With this invention computers became smaller, more powerful more reliable and they are able to run many different programs at the same time. In1980 Microsoft Disk Operating System (MS-Dos) was born and in 1981 IBM introduced the personal computer (PC) for home and office use. Three years later Apple launched the Macintosh computer with its icon driven interface and the 90s gave us Windows operating system.

The elements of a computer system fall into two major categories: hardware and software. Hardware is the equipment used to perform the necessary computations and includes the central processing unit (CPU), monitor, keyboard, mouse, printer, and speakers. Software consists of the programs that enable us to solve problems with a computer by providing it with lists of instructions to perform.

For more detail breakdown in History of Computers, there are the list from the early invention of computers to the latest.

1801: In France, Joseph Marie Jacquard invents a loom that uses punched wooden cards to automatically weave fabric designs. Early computers would use similar punch cards.

1822: English mathematician Charles Babbage conceives of a steam-driven calculating machine that would be able to compute tables of numbers. The project, funded by the English government, is a failure. More than a century later, however, the world's first computer was actually built.

1890: Herman Hollerith designs a punch card system to calculate the 1880 census, accomplishing the task in just three years and saving the government $5 million. He establishes a company that would ultimately become IBM.

1936: Alan Turing presents the notion of a universal machine, later called the Turing machine, capable of computing anything that is computable. The central concept of the modern computer was based on his ideas.

1937: J.V. Atanasoff, a professor of physics and mathematics at Iowa State University, attempts to build the first computer without gears, cams, belts or shafts.

1939: Hewlett-Packard is founded by David Packard and Bill Hewlett in a Palo Alto, California, garage, according to the Computer History Museum.

1941: Atanasoff and his graduate student, Clifford Berry, design a computer that can solve 29 equations simultaneously. This marks the first time a computer is able to store information on its main memory.

1943-1944: Two University of Pennsylvania professors, John Mauchly and J. Presper Eckert, build the Electronic Numerical Integrator and Calculator (ENIAC). Considered the grandfather of digital computers, it fills a 20-foot by 40-foot room and has 18,000 vacuum tubes.

1946: Mauchly and Presper leave the University of Pennsylvania and receive funding from the Census Bureau to build the UNIVAC, the first commercial computer for business and government applications.

1947: William Shockley, John Bardeen and Walter Brattain of Bell Laboratories invent the transistor. They discovered how to make an electric switch with solid materials and no need for a vacuum.

1953: Grace Hopper develops the first computer language, which eventually becomes known as COBOL. Thomas Johnson Watson Jr., son of IBM CEO Thomas Johnson Watson Sr., conceives the IBM 701 EDPM to help the United Nations keep tabs on Korea during the war.

1954: The FORTRAN programming language, an acronym for FORmula TRANslation, is developed by a team of programmers at IBM led by John Backus, according to the University of Michigan.

1958: Jack Kilby and Robert Noyce unveil the integrated circuit, known as the computer chip. Kilby was awarded the Nobel Prize in Physics in 2000 for his work.

1964: Douglas Engelbart shows a prototype of the modern computer, with a mouse and a graphical user interface (GUI). This marks the evolution of the computer from a specialized machine for scientists and mathematicians to technology that is more accessible to the general public.

1969: A group of developers at Bell Labs produce UNIX, an operating system that addressed compatibility issues. Written in the C programming language, UNIX was portable across multiple platforms and became the operating system of choice among mainframes at large companies and government entities. Due to the slow nature of the system, it never quite gained traction among home PC users.

1970: The newly formed Intel unveils the Intel 1103, the first Dynamic Access Memory (DRAM) chip.

1971: Alan Shugart leads a team of IBM engineers who invent the "floppy disk," allowing data to be shared among computers.

1973: Robert Metcalfe, a member of the research staff for Xerox, develops Ethernet for connecting multiple computers and other hardware.

1974-1977: A number of personal computers hit the market, including Scelbi & Mark-8 Altair, IBM 5100, Radio Shack's TRS-80 — affectionately known as the "Trash 80" — and the Commodore PET.

1975: The January issue of Popular Electronics magazine features the Altair 8080, described as the "world's first minicomputer kit to rival commercial models." Two "computer geeks," Paul Allen and Bill Gates, offer to write software for the Altair, using the new BASIC language. On April 4, after the success of this first endeavor, the two childhood friends form their own software company, Microsoft.

1976: Steve Jobs and Steve Wozniak start Apple Computers on April Fool's Day and roll out the Apple I, the first computer with a single-circuit board, according to Stanford University.

The TRS-80, introduced in 1977, was one of the first machines whose documentation was intended for non-geeks

1977: Radio Shack's initial production run of the TRS-80 was just 3,000. It sold like crazy. For the first time, non-geeks could write programs and make a computer do what they wished.

1977: Jobs and Wozniak incorporate Apple and show the Apple II at the first West Coast Computer Faire. It offers color graphics and incorporates an audio cassette drive for storage.

1978: Accountants rejoice at the introduction of VisiCalc, the first computerized spreadsheet program.

1979: Word processing becomes a reality as MicroPro International releases WordStar. "The defining change was to add margins and word wrap," said creator Rob Barnaby in email to Mike Petrie in 2000. "Additional changes included getting rid of command mode and adding a print function. I was the technical brains — I figured out how to do it, and did it, and documented it. "

1981: The first IBM personal computer, code-named "Acorn," is introduced. It uses Microsoft's MS-DOS operating system. It has an Intel chip, two floppy disks and an optional color monitor. Sears & Roebuck and Computerland sell the machines, marking the first time a computer is available through outside distributors. It also popularizes the term PC.

1983: Apple's Lisa is the first personal computer with a GUI. It also features a drop-down menu and icons. It flops but eventually evolves into the Macintosh. The Gavilan SC is the first portable computer with the familiar flip form factor and the first to be marketed as a "laptop."

1985: Microsoft announces Windows, according to Encyclopedia Britannica. This was the company's response to Apple's GUI. Commodore unveils the Amiga 1000, which features advanced audio and video capabilities.

1985: The first dot-com domain name is registered on March 15, years before the World Wide Web would mark the formal beginning of Internet history. The Symbolics Computer Company, a small Massachusetts computer manufacturer, registers Symbolics.com. More than two years later, only 100 dot-coms had been registered.

1986: Compaq brings the Deskpro 386 to market. Its 32-bit architecture provides as speed comparable to mainframes.

1990: Tim Berners-Lee, a researcher at CERN, the high-energy physics laboratory in Geneva, develops HyperText Markup Language (HTML), giving rise to the World Wide Web.

1993: The Pentium microprocessor advances the use of graphics and music on PCs.

1994: PCs become gaming machines as "Command & Conquer," "Alone in the Dark 2," "Theme Park," "Magic Carpet," "Descent" and "Little Big Adventure" are among the games to hit the market.

1996: Sergey Brin and Larry Page develop the Google search engine at Stanford University.

1997: Microsoft invests $150 million in Apple, which was struggling at the time, ending Apple's court case against Microsoft in which it alleged that Microsoft copied the "look and feel" of its operating system.

1999: The term Wi-Fi becomes part of the computing language and users begin connecting to the Internet without wires.

2001: Apple unveils the Mac OS X operating system, which provides protected memory architecture and pre-emptive multi-tasking, among other benefits. Not to be outdone, Microsoft rolls out Windows XP, which has a significantly redesigned GUI.

2003: The first 64-bit processor, AMD's Athlon 64, becomes available to the consumer market.

2004: Mozilla's Firefox 1.0 challenges Microsoft's Internet Explorer, the dominant Web browser. Facebook, a social networking site, launches.

2005: YouTube, a video sharing service, is founded. Google acquires Android, a Linux-based mobile phone operating system.

2006: Apple introduces the MacBook Pro, its first Intel-based, dual-core mobile computer, as well as an Intel-based iMac. Nintendo's Wii game console hits the market.

2007: The iPhone brings many computer functions to the smartphone.

2009: Microsoft launches Windows 7, which offers the ability to pin applications to the taskbar and advances in touch and handwriting recognition, among other features.

2010: Apple unveils the iPad, changing the way consumers view media and jumpstarting the dormant tablet computer segment.

2011: Google releases the Chromebook, a laptop that runs the Google Chrome OS

2012: Facebook gains 1 billion users on October 4.

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

2016: The first reprogrammable quantum computer was created. "Until now, there hasn't been any quantum-computing platform that had the capability to program new algorithms into their system. They're usually each tailored to attack a particular algorithm," said study lead author Shantanu Debnath, a quantum physicist and optical engineer at the University of Maryland, College Park.

2017: The Defense Advanced Research Projects Agency (DARPA) is developing a new "Molecular Informatics" program that uses molecules as computers. "Chemistry offers a rich set of properties that we may be able to harness for rapid, scalable information storage and processing," Anne Fischer, program manager in DARPA's Defense Sciences Office, said in a statement. "Millions of molecules exist, and each molecule has a unique three-dimensional atomic structure as well as variables such as shape, size, or even color. This richness provides a vast design space for exploring novel and multi-value ways to encode and process data beyond the 0s and 1s of current logic-based, digital architectures."

* 1. **Computer Hardware**

Main memory stores programs, data, and results. Most computers have two types of main memory: random access memory (RAM), which offers temporary storage of programs and data, and read-only memory (ROM), which stores programs or data permanently. RAM temporarily stores programs while they are being executed (carried out) by the computer. It also temporarily stores such data as numbers, names, and even pictures while a program is manipulating them. RAM is usually volatile memory, which means that everything in RAM will be lost when the computer is switched off.

ROM, on the other hand, stores information permanently within the computer. The computer can retrieve (or read), but cannot store (or write) information in ROM, hence its name, read-only. Because ROM is not volatile, the data stored there do not disappear when the computer is switched off. Start-up instructions and other critical instructions are burned into ROM chips at the factory. When we refer to main memory in this text, we mean RAM because that is the part of main memory that is normally accessible to the programmer.

The central processing unit (CPU) has two roles: coordinating all computer operations and performing arithmetic and logical operations on data. The CPU follows the instructions contained in a computer program to determine which operations should be carried out and in what order. It then transmits coordinating control signals to the other computer components.

The CPU can perform such arithmetic operations as addition, subtraction, multiplication, and division. The CPU can also compare the contents of two memory cells and make decisions based on the results of that comparison.

There are input/output devices to allow us to enter data for a computation and to observe the results of that computation. For example, keyboard as an input device and a monitor as an output device.

Computers are now linked together in networks so they can communicate with one another. In a local area network (LAN), computers and other devices in a building are connected by cables or a wireless network, allowing them to share information and resources such as printers, scanners, and secondary storage devices. A network that links many individual computers and local area networks over a large geographic area is called a wide area network (WAN). The most widely used aspect of the Internet is the World Wide Web (WWW), the universe of Internet-accessible resources that are navigable through the use of a graphical user interface (GUI).

* 1. **Computer Software**

The collection of computer programs that control the interaction of the user and the computer hardware is called the operating system (OS).

Here is a list of some of the operating system’s many responsibilities:

1. Communicating with the computer user: receiving commands and carrying them out or rejecting them with an error message.
2. Managing allocation of memory, of processor time, and of other resources for various tasks.
3. Collecting input from the keyboard, mouse, and other input devices, and providing this data to the currently running program.
4. Conveying program output to the screen, printer, or other output device.
5. Accessing data from secondary storage.
6. Writing data to secondary storage.

In addition to these responsibilities, the operating system of a computer with multiple users must verify each individual’s right to use the computer and must ensure that each user can access only data for which he or she has proper authorization.