HISTORY OF COMPUTERS

The evolution of computer has passed through different stages before it reached the present state of development. The evolution probably started from the 3500 BC when human being first started to learn to calculate with a calculating machine named Abacus. Thus, the evolution of counting system from abacus to modern Microcomputer is the result of continuous human effort in search of a more versatile and efficient machine.

Abacus

Abacus seems to be the earliest calculating machine, which was developed by the Chinese. Abacus consists of beads, which can move, in wires. The wires represented the column. The right most column represented the unit, the next for ten and so on. Numbers were represented by moving the beads at appropriate column. Abacus could perform simple addition and subtraction.

Pascal's Mechanical Calculator

Blaise Pascal, the French mathematician, laid the foundation of automatic computing. Blaise Pascal used his adding machine (1662) simply for addition and subtraction. The machine consisted of gears, wheels and dials. With this, calculation could be performed by dialing these series of wheels carrying the number 0 to 9 around their circumference. The wheel was arranged in such a manner that each wheel had 10 segments and when a wheel completed one rotation the next wheel would move by one segment. This machine was later improved by Gottfried (Germany) to perform multiplication and division.

Charles Babbage's Differential Engine

Charles Babbage, a professor of mathematics at Cambridge University, invented a machine called Differential Engine – which could evaluate accurately algebraic expressions and mathematical tables – correct up to 20

decimal places. Later, he developed analytical machine, which could perform addition at the rate of 60 per minute.

For technical limitations of that age Charles Babbage could not see his invention operational. However, and surprisingly enough, today's computer has building blocks, similar to what was proposed by him. For this reason, Charles Babbage is remembered as the father of computing, With him, his disciple and co-worker, Lady Lovelace is remembered with reverence as the first programmer of the world.

Mark-I – 1st Electro Mechanical Computer

In 1934, Harvard professor H. Eiken developed an automatic calculating machine, which was called Mark-I digital computer. It's internal operation was automatically controlled.

The basic drawback of the mechanical and electromechanical computers were:

- ❖ The speed was limited due to the friction/inertia generated by the movement of components.
- ❖ The data movement was quite difficult and unreliable.

The designers were looking for better switching devices, storing of the mechanism and reducing moving mechanical parts. With the advent of triode vacuum tubes, a better switching device of earlier years, designers shifted ton designing electronic computer.

Electronic Numeric Integrator And Calculator (ENIAC)

While Mark-I was the first electromechanical computer, the first electronic general purpose computer was built in 1946 by a team of professors at Moore School of University of Pennsylvania and was called ENIAC. The ENIAC ushered in the era of what is known as first generation computer. It was a

bulky machine consisting of 18,000 vacuum tubes, 70,000 resistors, 10,000 capacitors, 60,000 switches and a large size occupying 1500 Sq. feet of space. It was a very fast machine as compared to its ancestors and could perform 5000 additions or 350 simple multiplications in just one second.

The main features of ENIAC can be summarized as:-

❖ ENIAC was a general purpose computing machine where vaccum tube technique was used.
❖ ENIAC was based on decimal arithmetic.

Universal Automatic Computer (UNIVAC)

In the year 1946, Eckert and Mauchly founded their own company and began to work on the Universal Automatic Computer, or UNIVAC. In 1949, Romington Rand acquired the Eckert-Mauchly Computer corporation and in early 1951 the first UNICAC-1 became operational at the Census Bureau. It was followed by EDVAC (Electronic Discrete Variable Automatic Computer) which had a storage capacity of 1024 words of 44 bits each.

Let us answer the following question:
Who is known as father of computing? He is none other than the Charles Babbage

ADVANTAGES OF COMPUTERS

A Computer usually has:
1. Very high speed
2. Large shortage and retrieval capacity
3. Accuracy in calculation
4. Diligence
5. Versatility in application

Let us discuss the following characteristics of a computer in detail.

Speed: All the operations in a computer are caused by electrical pulses. We all know that electricity travels at the speed of light, computers too can perform innumerable operations in just 1 sec. The processing speed of a computer is generally measured in nanoseconds. By the time an average person takes to read the contents of this page, the earliest model of the IBM microcomputer would add together a million numbers and still have some time to spare! You can imagine what would be the speed of the latest models of computers running 100 times faster!

Storage: Computers have very large storage capacity. The contents of around two hundred sheets of A4 size paper can be stored on a small floppy disk, which is not even half the size of one sheet of paper. What would typically need large storage cabinets can be stored on a small floppy disk, which is not even half the size of a lunch box. Famous reference works like the "Encyclopedia Brittanica" and "Oxford Dictionary of English" occupies many large shelves in libraries. But today, they are stored in optical disks that are less in both size and weight. While this in itself is impressive, computers also provide very quick and easy access to all the data.

Apart from storing text, today's computers are also capable of storing pictures and sound in digital form, which means that even movies and music can be stored and sent to places quickly.

Accuracy: Computers have many check circuits built in and so normally they do not make mistakes. Errors in computing are generally due to human negligence rather than technological faults. We have to always remember the fact that a computer is unintelligent and has to be given precise instructions and correct data to carry out its operations. If the instruction is faulty or might mean more than one thing or if the data is wrong, the result coming out of the computer too would be wrong. This phenomenon of wrong output due to wrong input of instructions and/or data is termed as **Garbage in Garbage Out or GIGO** in computer jargon.

Diligence: Computers, being machines, do not suffer from fatigue and lack of

concentration. If five million calculations have to be performed, a computer can perform the 5 millionth calculation with same accuracy and speed as it performed the first calculation.

Versatility: Computers can perform a wide range of jobs with speed, accuracy and diligence. In an organisation, it is quite likely that the same computers are used for diverse purposes such as accounting, generating pay-slips, keeping track of manager's appointments, play games during the recreation hours.

LIMITATIONS

❖ Computers may pose a threat to personal privacy, became firms can so easily accumulate a detail picture of an individual's buying habits.

❖ Computer manufacturing processes require the use of hazardous chemicals, which could endanger workers and pollute water supplies.

❖ Discarded computers are taking up too much room in our nation's landfills

❖ Too much work at the computer can result in painful nerve disorders, such as carpal tunnel syndrome, the fastest growing type of occupational injury in the U.S.

❖ Computer failures do occur – and if they occur in a critical system, such as the air traffic control systems, lives may be endangered.

❖ Computers may displace workers by automating tasks that people used to perform or by enabling fewer workers to perform tasks more efficiently. Displaced workers may find jobs that pay substantially less if they can find jobs at all.