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Computer Technologies – Changing Trend

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Abstract: *With the evolution of time changes everything and thus the computer technologies. Starting from a very big sized computer we are now up to a pen shaped computer, lesser in size but highly efficient in technology and working perspectives, though all this had not occurred all of a sudden, a sequential phase has been progressed since the evolution of computer. More intelligence and abstraction has been featured with the new advance computer technologies.*

Keywords:- *Computing, Technologies, ICT, Bluetooth, Fuzzy-logic, ANN, Grid Computing, Data Mining.*

I. Introduction

Nowadays computer affects all the phases of human being whether it is his personal life, his professional life or whatever. New computing technologies, devices, applications and computing tools are being developed regularly. In this review paper the highlights of recent trends in computing technologies are mapped out along with their impact on human society. Starting from the earlier time of computer i.e. first generation of computer we are upto the current new era of Information and Communication Technology.

II. Definition: ‘New Computing Technology’

Now lets start from the word **New**, according to the free dictionary “Having been made or come into being only a short time ago” or we can say which is something recently made or developed or discovered. Now when we talk about computer we have various definitions of computer “An electronic device for storing and processing data, typically in binary form, according to instructions given to it in variable programs.” But now days a computer breaks these limitations and its existence and effects are available everywhere from a needle to airways, a computer has made an effect in human life from his birth time to his fate down. When we talk about modern computer we can say **computer** is an electronic device which is capable of receiving information (data) in a particular form and of performing a sequence of operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information or signals. According to The American Heritage® Science Dictionary, “Computer is a programmable machine that performs high speed processing of numbers, as well as of text, graphics, symbols and sound. All computers contain a central processing unit that interprets and executes instructions; input devices, such as a keyboard and a mouse, through which data and commands enter the computer; memory that enables the computer to store programs and data; and output devices, such as printers and display screens, that show the results after the computer has processed data.” And when we talk about **Technology** “it is a way or method to achieve a commercial or industrial objective” or we can say technology is the use of equipment, machines and ideas to produce and develop the application of scientific knowledge or technical design for practical purpose or utilize these resources to satisfy their needs.

Today scientists, engineers and researchers collaborate to develop various new technologies of processing, sorting, searching, analyzing, storing and displaying data or information. For these various tasks we communicate with the various electronic devices to achieve or complete our required need So, from this we have a common platform which we say Information and communication technology where we use various processing techniques to communicate with electronic devices like satellites, computers etc. We can say Information and communication Technology (ICT) covers all the techniques that will store, manipulate, transmit or receive Information and facilitate different forms of communication between human beings and electronic system. ICT refers to any type of technology by which we can communicate or transmit the information or data between a user and electronic device or vice versa. Today ICT is all around us and it affects our life in various ways. It’s a sector that is growing day by day and today ICT skills are more important in every area of the human life whether we talk about entertainment sector, job sector or else.

There are two sites of ICT:

- (1) how it works?
- (2) How to use it?

In first site we have programmers or scientists who programmed or develop the product and on second site we have the users of product who use or work on that product.

III. Computer and Internet

“ Who invented the computer?” is not a major question, the real question is that how computer made its own importance by which everything depends on it and what are the mile stones. Some of the initial key contributors who had developed and directly or indirectly contributed to achieve this golden time by this technology are Howard Aiken, John W. Mauchly, Jon Von Neumann, J. Presper Eckert, Charles Babbage, Clifford Berry, Remington Rand, Alan Turing and Seymour Rubenstein. When we see the computer era we have its five generations which are shown in the below table:-

Table 1: Growth of Computer

Year	Description
1969	ARPANET is born
1971	The first virus Creeper created
1973	ARPANET users 35
1976	Queen Elizabeth sends the first royal email msg.
1979	The first USENET news groups are established.
1981	ARPANET grows to 213 hosts
1982	The term “Internet” is coined.
1987	Internet hosts grow to more than 10,000
1992	First Audio & Video broadcast
1993	Mosaic, the first Graphic based web browser
1996	Telecommunications Act
1998	Over 37 million hosts & over 4 million web-sites
2000	Iloveyou virus- 50 million users report being infected within 10 days.
2003	Apple launches safari browser.
2006	Social N/W site Twitter started.
2008	Google launches chrome
2009	The Seattle Post-intelligencer becomes the first daily news paper to move entirely online.
2010	255 million websites as of Dec. 2010
2012	634 million websites as of Dec. 2012

The internet is an international network consisting of individual computers and computer networks that are all interconnected by many paths to share various data or information to change social, political and economic structure without regard for geographic location. The internet was created on January 2, 1969 by the US Department of Defense Advanced Research Projects Agency (DARPA) , which gave the internet its first name ARPANET. The following table shows some milestones in the history of internet, which shows its growth:

** All the data are collect from various websites and books.

Table 2: Growth of Internet (1969-2012)

Generat ion	Time Period	Description/T echnology	Computer	Languages used
First	1939-1954	Vacuum Tube	ENIAC	Electric Wired Board
Second	1954-1959	Transistor	IBM 1401	FORTRAN, COBOL etc.
Third	1959-1971	Integrated Circuits or Microchips	IBM System/ 360	COBOL, PASCAL,ALGOL
Fourth	1971-1980	VLSI Technology	DEC 10, CRAY-1	C,C++, DBASE
Fifth	1980-till date	ULSI Technology	Robotics, Leaptops, Tablet etc.	Java, .NET framework etc.

The below figure shows the growth of internet users from 1981 to December 2012 world wide-

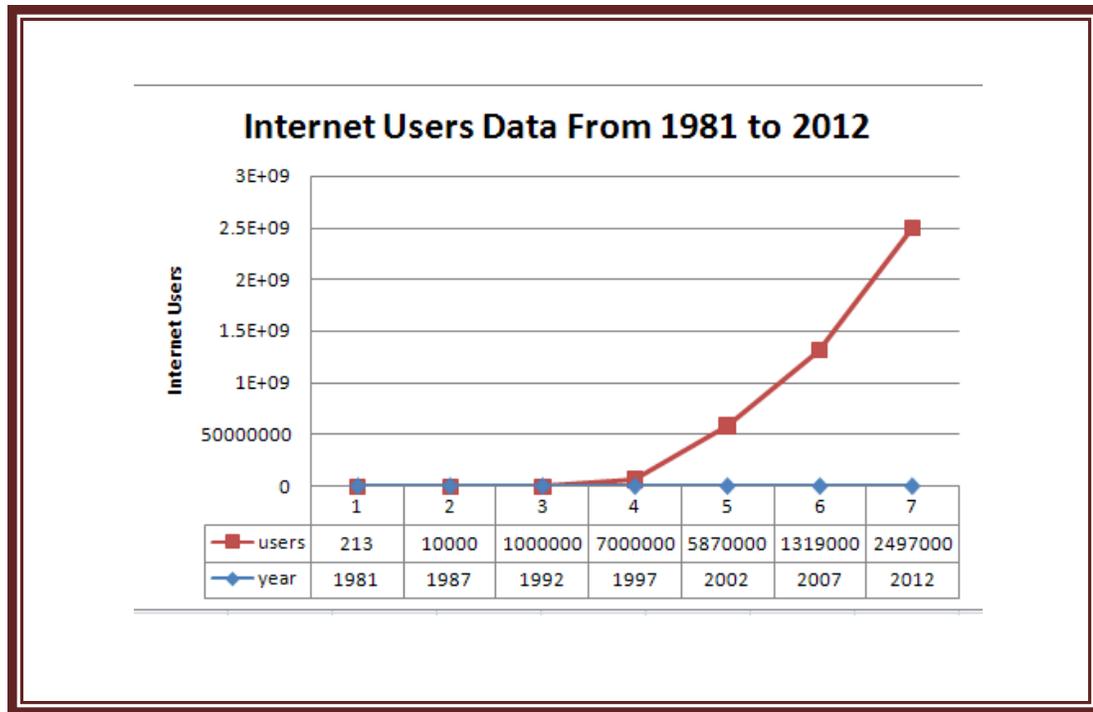


Fig 1: growth of internet users (1981-2012) **

(**all the data are collected from various websites.)

When we see the year 1981 we have only 213 hosts and the number of users increasingly rapidly day by day.

IV. RULE of CHANGE

A famous quote from bhagwad geeta “Parivartan hi sansaar ka niyam hai” explains why the ICT innovations of the past are getting out dated and why our present technologies will not prove useful after some time.

V. GROWTH in ICT

A computer programming language is a main constraint by encoding algorithms to develop any software. Which programming language we are going to select to solve our problem is a very important step for implementing any software. Programmers can use assembly languages, machine language our high level language according to their need. At this time we have various programming languages whereas electric wired board were used during first generation then assembly and high level languages like FORTRAN, COBOL etc. were used during second generation progressing to high level languages like FORTRAN –II to IV, COBOL, PASCAL, BASIC, ALGOL-68 etc. during third generation and then to higher level languages C, C++, DBASE etc. and at present for fifth generation computers we work on Java, .NET framework etc. There are two competing models in software era i.e open source softwares and proprietary softwares. Today computing is applied in every era of human life such as communication, education, research and development, design and implementation, manufacturing, banking, entertainment, healthcare, sports, security, politics, transportation etc. Computer has become a basic need of human life without which human life can't be imagined. In earlier days computing was restricted to logical and mathematical evaluations but now computing breaks all these boundations leading to a new era of computing which is called intelligent computational techniques such as decision support system, expert system using various artificial intelligence techniques, fuzzy logic, which is a scientific methodology that recognize more than simple true and false values. With fuzzy logic, propositions can be represented with degree of truthfulness and falsehood. An another new concept is ANN (Artificial Neural Network) is a computational model based on the neural structure of brain, a neural network works by creating connections between processing elements, the computer equivalent of neurons. A neural network implies a non digital computer, but neural networks can be simulated on digital computers. ANN are currently used in image recognition system, aerospace applications etc. genetic algorithm is another heuristic search optimization computing technique based on the idea of natural selection and genetics. Evolutionary algorithm is another new computing paradigm used to describe computer based problem solving systems which use computational models of evolutionary processes as key element in their design and implementation. <http://www.cs.cmu.edu/Groups/AI/html/faqs/ai/genetic/part2/faq-doc-1.html>).

At earlier day's computer were centrally located machines at specific organization with limited accessibility, due to its high cost very few people use it. But now conditions are changed as the present age is a computer or internet age, more people have their own PCs or laptops through various networks like internet, intranet, extranet they can communicate and easily

interchange their data. Adoption of new technologies like Cloud computing and grid computing are revolutionary changing our computing interest. Short introduction of some new technologies that make important effect in human life are—
Bluetooth technology is created by Ericsson in 1994, “Bluetooth technology is a wireless protocol that connects electronic devices while they are close to each other”¹. Bluetooth technology operates in the ISM band at 2.4 GHz to 2.485 GHz at a nominal rate of 1600 hops/sec full duplex signal. Depending on the device the Bluetooth operating ranges are as follows-

(Table 3: Bluetooth Range)²

Class	Range
Class 3	Up to 1 meter or 3 feet
Class 2	10 meter or 30 feet (mobile devices)
Class 1	100 meter or 300 feet (Industrial use case)

Bluetooth technology is designed to consume a very low power, the most frequently used class is class 2 and it uses 2.5 mW of power.

- ❖ *WiFi (Wireless Fidelity)* is the way to connect various devices together without wires. WiFi (WLAN) is based on IEEE- 802.11 standards and can be implemented in a number of ways according to the complexity desired. Mainly we use one of these three ways peer-to-peer, Client & Access Point and Multiple Access Points.
- ❖ *Cloud Computing* is defined as a type of internet based computing where different services like storage, softwares, and infrastructures are delivered to an organization’s computers and devices through the internet. We can say cloud computing is the delivery of on-demand computing resources over the internet. We have three types of clouds available which are private, public and hybrid cloud.
- ❖ *Grid Computing* “is a service for sharing computer power and data storage capacity over the internet³” Some applications of grid computing are Virtual worlds, Weather Simulation, Analyzing DNA and genomes.
- ❖ *Data Mining* is the process of analyzing data from various perspectives and converts it into useful information. There are number of Data Mining softwares like:- Intelligent Miner by IBM, Clementine by SPSS, Enterprise Miner by SAS.
- ❖ *Support Vector Machine*, introduced in COLT-92, by Boser, Guyon and Vapnik, “SVMs deliver state-of-the-art performance in real-world applications such as text categorization, hand-written character recognition, image classification, bio sequences analysis, etc., and are now established as one of the standard tools for machine learning and data mining.⁴”

VI. FUTURISTIC DEVICES and APPLICATIONS

Now and in the future hardware and software developers should work on products which are much more portable and have fast execution speed as well as less expensive to better support human needs. Some computing devices which are proposed for future are-

- ❖ *HP LiM*, (HP Less is More) is proposed to be sold as a stand alone machine based on the concept of 19” transparent OLED screen with a wireless keyboard along with a virtual trackpad.
- ❖ *B-Membrane Computer*, The computer of tomorrow, include a slim LCD monitor, a Membrane keyboard and mouse that appears when needed, Optical drive and Ambient light effect. The main attraction of this B-Membrane computer is its membrane keyboard and mouse and when we don’t use this as a computer, the projector can beam ambient light effects on any surface.
- ❖ *Paper Laptop*, the design and concept of paper laptop was given by Je Sung Park, it uses recycled paper or pulp material all packed in layers (Discovery News, Feb 16, 2012).

VII. IMPACT of COMPUTING TECHNOLOGIES

Computer technology is a vastly spreading technology which is ready to engulf every aspect in itself whether its technical, medical, engineering, aeronautical, social, cultural etc. Being a very handy tool for human, it finds its use in every aspect for its easy access, large storage, fast computability, easier execution, interactive behavior. It can be operated upon as desired by its programmer/developer with an easier accessible option for its intended use. Its impact can be seen on different age groups as :

- Children found an interactive and friendly option for their studies and project work through various simulation and computer designing software’s.
- Youths are getting technology freak in terms of hardware software upgrades and versions. Interest in technology and applications make them well aware and thus curiosity brings better result.
- Different journals, blogs are there for the people to express and share their views throughout.
- Social sites has shrieked the world interconnecting friends and families.
- Gaming and simulation tutor proves very useful for learning driving, real time situation handling and improving gaming skills.

- Artificial Intelligence readily imparts varied degree of intelligence and computational ability to machines.
- CAD/CAM (Computer Aided designing and manufacturing) is serving its purpose efficiently.
- LSI and VLSI integration has reduced the size of computers to very considerable level making it portable and comfortable to use.

VIII. Conclusion

The advancement in computer technologies has been very fruitful in the modern scenario leading to simplification and effectiveness in each and every task. Degree of task ranging from a small complexity to the highest one has been lessened by the use of computer technologies and this has been achieved progressively. A study of the progressive growth of the technical changes leads to a better understanding of their usage and implementation in the real life situations. Imparting intelligence to the electronic hardware and thus enabling its decision capability proves its importance in every aspect of life.

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