Current Trends in Information Technology

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Abstract: Information Technology is the use of computers to store, transmit, retrieve, and manipulate data or information in the context of business or other organizations. It is the sub-part of information and communication technology. Information Technology system is actually a system including all hardware, software and peripherals equipment, operated by a group of users. In the early time, **Abacus** is used for calculations. With the passing of time, the new modern technologies are built time to time. In this paper, the different generations of computer are discussed. E.g. First generation computers were very fast computer in their time but they are very slow in speed, bulky in size, produced large heat as compare to present time technology computers. So with the advancement of time human generate the new technology for their convenience. With these new technologies machines are very helpful for the human being not only in their professional life only but also in their personal life. This paper will discuss about the new technology that are introduced in the world that will be helpful for the humans in present as well as in future time.

Keywords: Definition, past, present, future of computer World, new technologies, Big data, Cloud Computing, The internet of things, Virtual Reality

1. INTRODUCTION

Before Starting anything we should know the basic ***definition of Computer***:

1.1 What is Computer?

Computer is an electronic data processing device through which we can perform many arithmetic as well as logical operations**.** ***Arithmetic Operations*** like Addition (+), subtraction (-), multiplication (*), Division (/) and remainder after division (%) and ***Logical Operations*** like greater than (>), Smaller than (>), greater than equal to (>=), smaller than equal to (<=), equals to (==), not equals to (! =).

1.1.1 What is the Full form of Computer?

C	**COMMONLY**
O	**OPERATING**
M	**MACHINE**
P	**PARTICULARLY**
U	**USED FOR**
T	**TRADE**
E	**EDUCATION AND**
R	**RESEARCH**

Means that computer is the only machine through which we can perform many different kinds of works for different kinds of people according to their requirement. Like from this single machine we can perform the business dealing for large businessmen's, students can take the help from google for preparing their assignments, college projects etc. and the researchers can also use computer internet for their researches.

2. PAST OF INFORMATION TECHNOLOGY

Pre -20th century abacus is used for calculation task. After that an English mechanical engineer named "Charles Babbage" originated the concept of programmable computer. He is also considered as the ***father of Computer***. After that many different generations came into existence. With the passing of time many different generations of computer are developed. We firstly discuss these generations of computer in detail. We are currently working on the 5th generations of computer. So computer generations are first generation computer to fifth generation computer.

2.1 First generation Computer (1942-1955)

In the first generation computer Vacuum ***tubes*** are used as the major piece of technology. These Vacuum tubes are used as the basic components for the memory and circuitry of CPU. These Vacuum tubes are very large components that's why they required large room for installation. They looked like electric bulb and these tubes produced lots of heat and the installations used to fuse frequently. Because of frequent failure they were very expensive computers of their time.

In these computer Batch processing systems were used. In these computers punch cards, magnetic tape and paper tape were used as input and output devices. Machine code is used as programming language in these computers.

Features of First Generation Computer

1. These computers used vacuum tube technology.
2. These computers are unreliable, costly, large in size.
3. These computers had slow input and output devices, were large in size also produce lots of heat resulted in required Ac to cool them.

Examples: ENIAC, EDVAC, UNIVAC, IBM-701, IBM-650

2.2 Second Generation Computer (1955-1964)

In the second generation computer, vacuum tubes are replaced with the transistors. These transistors were very compact, consumed less power and were cheaper than the vacuum tubes. these generation's computer produced less heat as compare to first generation computer. These computers were small in size as compare to first generation computer. In these computer "Assembly language" and punched card were used as input. The speed of these computers is also increased as compare to the first generation computer. The second generation computers still have some problems like cooling system is required. these machines required the constant maintained.

Example: Honeywell 400, IBM 7094, CDC 3600, IBM 1620 etc.

2.3 Third Generation computer (1964-1975)

These computers were based on the Integrated Circuits. These circuits are also called IC. IC was a single component containing number of transistor, resistors and capacitors along with the associated circuitry. The IC was invented by Robert Noyce and jack Kilby in 1958-1959. These computers were cheaper as compared to second generation computers. These computers were more reliable, smaller in size and more efficient than the second generation computer. The multiprogramming , Time Sharing operating system were used in these computers. In these computers keyboard and mouse were used instead of punched card. The computational time of these computer was in nanoseconds instead of microseconds. Languages like COBOL, PASCAL, PL/1 were used in these computers. These computers also had some disadvantages like: The maintenance of IC chips were difficult, Air conditioners were also required to cool down these machines.
Examples: IBM-360 series, PDP9Personal Data Processor), TDC-316, ICL 2900 etc.

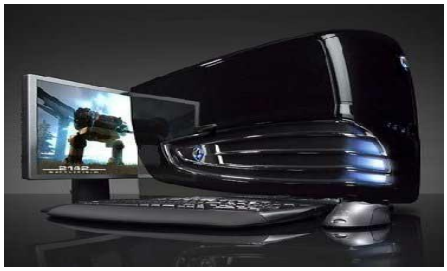
2.4 Fourth generation Computer (1975-1990)

These computers used Very Large Scale Integration Circuits(VLSI) circuits. With this technology VLSI circuits having about 5000 transistors and other circuits elements in a single chip that make it possible to us the microprocessor in this generation. That's why this technology is also known as microprocessor based technology. These microprocessors are used for any logical as well as arithmetic operations in the computers. In these computer Graphical user Interface (GUI) is also exploited to offer more comfort to the user.

These computers were small in size as compare to the previous generation computer. They have the ability to be linked and creating networks. so in this generation, we can say that the development, birth and rapid evaluation of internet was happened. These computers became more reliable, powerful, compact and affordable. As a result, it gave the birth to the personal computer(PC). Real Time, Time Sharing and distributed Operating System were used in these generation computers. All the high level languages like: C, C++ were used in these generation computers. In These generation computer no AC is required for cooling and computer become easily available.

Example: STAR 1000, PDP 11, CRAy-1 etc.

2.5 Fifth Generation computer(1990-present)



Artificial Intelligence is used in this generation. The main motive of these computer is to generate the device which could respond to natural language input and are capable of learning and self-organization. In this generation the Very large scale integration(VLSI) is replaced with the Ultra Large Scale Integration(ULSI) technology. In the ULSI technology microprocessor chips having ten million of electric components on single chip. In this generation Parallel Processing hardware and Artificial intelligence (A.I) software are used. In these computers all the high level languages like C, C++, Java, .Net etc are used. These computers are more user friendly and have the multimedia features. The AI includes: Natural Networks, Robotics, Game playing, Expert System development to make real life situation decision. These computers are very reliable and work faster.

Example: Desktop, Laptop, Notebook, Ultra book, Chrome Book etc.

3. NEW TRENDS IN INFORMATION TECHNOLOGY

With the advancement of time Researchers creates the new technologies in the Information System. To make the computer system more helpful for the world, many new and different technologies has been developed. In current time, below given technologies are in trends. Let's discuss them:

3.1 BIG DATA

3.1.1 Data Raw facts and figures are called data. Any name, quantity, symbols on which the operation is performed is called Data.

3.1.2 Big Data Big Data is a term that describes the large volume of data. so it is the data in the huge size and yet growing exponentially with time. In simple term we can say that data is so large and complex that none of the traditional data management tools are able to store it or process it efficiently. It is not the amount of data that is important. It is what organizations doo with the data matters. Big data can be used for analysing the better decisions and strategic business moves.

Examples of Big Data

(a) The New York Stock Exchange generates one terabytes of new data per day.
(b) Big Data is used by Social Media. Example: Facebook 500+ terabytes of new data ingested into the database.

3.1.2.1 Characteristics of Big Data

3.1.2.1.1 VOLUME

Size of the data plays a very crucial role in determining value of data. Organizations collect data from a variety of sources including business transactions, social media and information from sensor. So we can say that whether a particular data can actually be a big data or not is dependent on the volume of the Data. For many organizations data can be tens of terabytes or for others it can be hundreds of petabytes.

3.1.2.1.2 VELOCITY

Velocity is the fast rate at which data is received and acted on. Big Data velocity deals with the speed at which data flows in from sources like business process, mobile devices, social media sites etc. Some internet enabled smart products operate in real time or near real time and will require real time evaluation and action.

3.1.2.1.3 Variety It refers to the different type of data available. Data can be in structured, numeric or in unstructured form, email, video, audio etc. Unstructured and semi structured data types required additional processing to derive meaning and support meta data.

3.1.3 Benefits of Big Data

- With the use of Big Data, it is possible to take/gain the complete answer.
- With the complete information means more confidence in data means completely different approach to tackling the problem.

3.1.4 WHO USES THE BIG DATA

- ✓ **Banking with** the large amount of information from countless sources, banks find the new way to manage the big data. With the help of big data banks can find the full details about their customers and can be aware from the fraud.
- ✓ **Government** uses the Big Data as they have lots of records regarding the crimes to keep their list up to date.
- ✓ **Education** by Analysing big data they can identify the students adequate progress, student at risk and can also implement a better system for evaluation and support of teacher and principal.
- ✓ **Health Care in** health care, Big data can be used to patient record, treatment plans and prescription information. with the help of this data record a fast, accurate treatment could be given to the patient.
- ✓ **Manufacturing** with the help of Big Data, the manufacture can experience the previous loses and improve their business conditions.

3.2 CLOUD COMPUTING

3.2.1 CLOUD

The term cloud refers to a network or internet. In information system, cloud means the remote location. cloud can provide the services over the private or public networks. e.g. LAN, WAN

3.2.2 CLOUD COMPUTING

It refers to manipulating, configuring and accessing the hardware and software resources remotely. Cloud computing offers platform independency, as the software is not required to be installed locally on the PC. Thus cloud computing makes our business applications mobile and collaborative.

3.2.3 Types of Cloud Computing It can be divided into four different parts.

3.2.3.1 Public Cloud

The public cloud is the one in which system and services to be easily accessible to the general public. It may be less secure because of its public property.

3.2.3.2 Private Cloud

In the private cloud, the system and services are allowed to be accessed in the organizations private cloud is secure because of its private nature.

3.2.3.3 Community Cloud in this the group of organizations can access the system and services.

3.2.3.4 Hybrid Cloud

This cloud is the mixture of public and private cloud. In this the critical activities are performed using the private cloud whereas the non-critical tasks are performed using public cloud.

3.2.4 SERVICES MODELS OF CLOUD COMPUTING

It has three basic service Models.

- ✓ **Infrastructure as a Service (Iaas)**
- ✓ **Platform as a Service (Paas)**
- ✓ **Software as a Service (Saas)**

3.2.4.1 Infrastructure as a Service(Iaas)

The infrastructure as a service provides the access to fundamental resources such as physical machines, virtual machines, virtual storages etc.

3.2.4.2 Platform as a Service(Paas) It refers to cloud computing services that supply an on demand environment for developing, testing, delivering and managing software application. Paas make it easier for developer to quick create web or mobile apps, without worrying about setting up or managing the underlying infrastructure for the server, network and database needed for development.

3.2.4.3 Software as a Service(Saas) It allow to use software applications a service to end users. it is the method for delivering software applications over the internet, on demand and typically on a subscription basis.

3.2.5 BENEFITS OF CLOUD COMPUTING

- ➢ With the help of cloud computing we can easily crete new apps and services.
- ➢ It is useful in test and built new applications.
- ➢ It is helpful in protecting your data more cost efficiently by transferring data over the internet.
- ➢ Helpful in connecting with your audience anywhere, anytime on any device with high definition video and audio with global distribution.
- ➢ One can manipulate and analyse the application online at any time.
- ➢ It offers on demand self-service. The resources can be used without interaction with cloud service provider.

3.3 MOBILE APPLICATION

It is also known as mobile app. It is a computer program or software application designed to run on a mobile device such as phone or tablet. Mobile applications used to provide user with similar services to those accessed on PC's. Apps were originally intended for productivity assistance such as email, calendar and contact databases, but the public demand for apps caused rapid expansion into other areas such as mobile games, factory automation, GPs and location based services and ticket purchases. so that these are now millions of apps available. Apps are generally small, individual software units with limited functions. This use of app software was originally popularized by Apple INC. and its app store, which offers thousands of applications for iphone, ipad and ipod touch.

3.4 INTERNET OF THINGS

The internet of things (IOT) is the extension of internet connectivity into physical devices and everyday objects. The IOT is a system of interrelated computing devices, mechanical and digital machines, objects animals or people that are provided with different identities and the ability to transfer data over a network without any requirement of human to human or human to computer interaction. e.g. An air conditioners sensor can gather the data regarding the outside temperature and accordingly adjust the air conditioners temperature to increase or decrease it with respect to the outside climate.

3.5 MACHINE LEARNING

Machine Learning is the part of Artificial Intelligence. It is the competency of the software to perform single or series of tasks intelligently without being programmed for those activities. Basically the simple software behaves the same way the programmer programmed it. But in the machine learning it works in one step further by making the software capable of accomplishing intended tasks by using statistical analysis and predictive analysis techniques. The best example of this is when we like or comment on friend's pictures or video on social media site, the related images and videos earlier posted keeps on displaying. same way we get the notification of "people you may know" suggestions are the examples of machine learning.

3.6 VIRTUAL REALITY

The definition of virtual is "near" and reality means is what we experience as human being. So it means near to reality. Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user beliefs and accepts it as a real environment. In computer, Virtual reality is experienced through two from five sense organs named sight and sounds. Virtual reality can also be defined as a believable, interactive 3D computer created world for you to explore and to get the feel that you are really there both physically and mentally.

3.7 GRID SCALE ENERGY

It includes the new battery technology such as sodium ion and zinc air which are more efficient and affordable and facilitate the use of renewable energy. It also allows your smart phones to stand for longer time too.

3.8 AUTONOMOUS VEHICLE

These vehicles are capable of sensing its environment and moving with little or no human input. These vehicles are also known as self-driving car, robot car or autonomous car. These vehicles combine a variety of sensors to perceive their surroundings, such as radar, GPS, Sonar etc.

3.9 PEROVSKITE SOLAR CELL

These are special kind of cells that can store large amount of solar energy. Perovskite are a class of materials that shares a similar structure, which shows a myriad of exciting properties like superconductivity, magneto resistance and more. These easily synthesized materials are considered the future of solar cell as their distinctive structure makes them perfect for enabling low cost, efficient photovoltaic. They are also predicted to play a role of next generation electric vehicle batteries, sensors, laser and much more.

3.10 OPTOGENETICS

Imagine turning some of your neurons on at some point of view and turning them down at some point which is indirectly controlling your emotions and addictions. This is possible only by Optogenetics. Neuron scientists can selectively turn neurons on and off with a great level of precision. this way many of the mental disorders can be suppressed.

3.11 ORGANS ON CHIPS

This is the new type of technology that can effectively emulate human organs allowing new drugs to tested more accurately and replacing human, animal testing.

4. CONCLUSION

From the above discussion, we can say that with the passing of time day by day, according to the requirement of human being, new technologies are build and this process will continue in future for fulfilling the requirement of the people like the autonomous vehicle that has the capability to drive without human and it also use many sensors. so the chances of accidents become less as it is machine and it will work properly and no chances of unconscious mind. But with the advancement, there are also some drawbacks that human totally dependent of machines. there will less physical movement, which is not beneficial for human health.

REFERENCES:

1.https://www.google.com/amp/s/www.geeksforgeeks.org/generations-of-computer/amp
2.http://btob.co.nz/business-news/five-generations-computers
3.https://www.tutorialspoint.com/computer_fundamentals/computer_fifth_generation.html
4.https://www.guru99.com/what-is-big-data.html
5.https://www.sas.com/en_in/insights/big-data/what-is-big-data.html#dmworld
6.https://www.oracle.com/in/big-data/guide/what-is-big-data.html
7.https://www.tutorialspoint.com/cloud_computing/cloud_computing_overview.htm
8.https://azure.microsoft.com/en-ca/overview/what-is-cloud-computing
9.https://en.m.wikipedia.org/wiki/Mobile_app
10.https://www.techopedia.com/definition/2953/mobile-application-mobile-app
11.https://www.google.com/amp/s/data-flair.training/blogs/iot-tutorial/amp
12.https://www.google.com/amp/s/www.iotforall.com/what-is-iot-simple-explanation/amp
13.https://www.realitytechnologies.com/virtual-reality
14.https://www.quora.com/What-is-virtual-reality
15.https://whatis.techtarget.com/definition/virtual-reality