A REVIEW STUDY OF THE HISTORICAL DEVELOPMENT, GENERATIONS AND COMPUTER APPLICATIONS

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Abstract

Computers, the wonder machines of our time, did not just emerge to take up the position and status it occupies today. Rather, it evolved gradually, and earlier without much recognition and regard, until it eventually attained it's present enviable state. This is an overview study on the state of computer science with special attention on the historical development of computers, computer science, computer generations and computer applications. It equally established the developments in information technology, library services as associated with the emergence of computers.

Introduction

Oku (2006), stated that computer no longer sounds strange to many for its popularity and wide spectrum of applications. Those in the financial houses have so embraced it that it looks as if it is impossible to transact any banking business without the computer. The industrial society has engaged it as a tool for production control i.e. signal to control other machines or process. Government and non-governmental organizations, use it for human decision making. The school system seems not to be left out of the computer race, but having their "stand alone" personal computer (PC) mostly for their secretarial work.

According to Johnson (1993), the impact of micro computer and micro processor technology in the teaching of sciences and business subjects suggest that any school system and organization which do not incorporate the opportunity for the science teacher to develop and understanding of, and the capability to deal with this revolutionary technology would be considered to have failed in fulfilling their responsibility. Yet it has been observed with dismay and utmost displeasure that most, if not all our state-owned schools, are yet to incorporate the use of computer in the teaching and learning of science. The service of libraries in this area is equally rendered without the use of computer.

Abimbode (1995), defined computer as an electronic machine or set of machine, which . accept data (raw information) present to it in a format and carries out some operations on the ' data, then produce result in a specific format as information for:

i. Effective teaching and learning of science and other subjects
ii. Human decision making in school, business organization and other government establishments
iii. Signal to control other machines of process
iv. Further input into some other machines.
processes.

The Concept of Computer Science

French (1992), stated that computer science is concerned with the application of scientific principles to the design, construction and maintenance of systems based upon the use of computers. It is an area of study that is typically concerned with the appreciation of scientific principles.

Computer science came into its own as a discipline, in the 1960s. The first computer science department was formed at Pardue University in 1962. The first person to receive a Ph.D. from a computer science department was Richard Wexelblat, at the University of Pennsylvania in December 1965. In 1981, the first computer virus was developed. Leonard

Adleman, now at the University of Southern California, coined the term VIRUS.

Historical Development of Computer

The computer has taken a very long time to be what it is today and what it will be in the next generation. The developmental history of computer is rapid and stills very much in progress. Adjarho (2004), stated that from the time of the bible days, a lot of arithmetic was done and counting in one form or the other was in use in other to relay information. Mechanical devices (machines with only mechanical parts) where used to aid calculation for thousands of years. The earliest mechanical calculating device, ABACUS, probably existed in Babylon (present day Iraq) at about 3000 B.C.

Charles Babbage (1791-1871), worked on two mechanical devices. He produced, a prototype of this "difference engine" by 1822 and with the help of the British government started work on the full machine in 1823. Herman Hollerith, the world's first statistical computation (1860-1929), invented a punch-card tabulation machine system primarily for statistical computation. It should be noted that punched card technology was used in computer up until the late 1970s. Actually, the calculations required for ballistics during World War)l spurred the development of the general-purpose electronic digital computer.

In 1944, Howard H. Aiken (1900 -1973), built the Mark 1 electromachanical computer with the assistance of international Business Machines (IBM). In 1946, John W. Mauchly and J. Prosper Eckert, built the giant ENIAC (Electronic Numerical Integrator and Computer) machine at the Moore School at the University of Pennsylvania, USA. In 1941, Konrad Zuse in Germany built the first operational general-purpose program -controlled calculator, the Z3.

Fred Brooks, at IBM designed system/360, a line of different computers with the same architecture and instruction set, from small to top of the line. Supercomputer became popular in the 1970s. Seymour Cray, designed the CRAY-1, which was first shipped in March 1976j It could perform 160 million operations in a second. The *CRAY* XMP came out in 1982. In 1979, three graduate students in North Carolina developed a distributed news server, which eventually became USEnet.

In the 1980s, like never before, personal computers (PCs) came on the increase. In 1984, Apple first marketed the Macintosh computer. In 1987, the "US National Science Foundation started NSFnet, precursor to part of today's Internet. The computers sizes now get smaller and smaller, and the birth of nano-technology is on the explosion. The evolution of digital computing as seen above is often divided into generations. *Each* generation is characterized by dramatic improvement over the previous generation in the technology used to build computers, the internal organization of computer system, and programming languages. In the computer world, we measure technological advancement by generation. Each generation indicates a significant change in computer design.

Areas of Computer Application

The present state of computer has made it assume good positions in virtually all human endeavours. H has maintained wonderful applications in education, medicine, information communication, government and public services, designs, finance and information retrieval.

In education, teaching and learning processes are carried out with computers. Various programs such as Computer Assisted Instruction (CAI), Computer Assisted Learning (CAL), and Computer Managed Learning (CML) have been designed to support teaching and learning. The simulation and programming characteristics of computer also play vital role in educational development and growth.

In medicine, computer now functions prominently in hospital administration, patient monitoring, patient data (creation, storage and retrieval), medical record keeping, diagnosis,

physiologic
al modeling
and
simulations
as well as
researches.

In design computer can be used to effectively carry out architectural designs, town planning, construction engineering, and textiles.

In finance, computer is now .used for transfer of fund from one country to another. There are now credit cards which when inserted into point of sale (POS), can carryout transactions at remote stations. Electronic fund transfer (EFT) can enable customers view their account from home. Clearing banks use the SWIFT (Society for Worldwide Interbank Financial Telecommunication) to cater for Interbank transactions at international levels. The Western Union Transfer is a typical application of SWIFT by the Union Bank PLS, Nigeria. Computer is equally useful in insurance, building societies and stock broking transactions.

In communication, computer is used in airline reservations, road transport, railway transportation, shipping, space flight and telecommunication. In telecommunication, computer is used for telephone switching, (automatic routing and co'nnection of calls), message switching, transmission of computer data via networks satellite communications and electronics mail (EM).

In government and public services, computers are mostly used by central government, department, state government, local authorities and public utilities. The electricity and telephone bills are presently computer generated (Aghware, 2004).

The Place of Computer in Information Technology

Mines (1999), stated that three key areas have led to the establishment of the information society. The areas are communication, computer and information technologies. These have converged during the last few years to give rise to powerful management tools. Some major development since the 1940s are given as shown by the table below:

Developments Technology

S/N	Hoc; id e	Communication Technnnlngv	Computer Technology	Information Technology
1	1 'Mils	Radio, military mobile radio	Single function (>cncra! purpose	
2	I'JSIIs	Tape recording. cable Microwave links. Crossbar switching, Dircc! distance calling. Video recording.	Commercial computer. programming languages. transistor	
3	I960	Satellite communication. Digital communication, Electronic switching	Integrated circuits minicomputers, Structured program in ing	-
4	1970	Facsimile transmission. Mobile radio, Pocket switching Videotex!	Database management system, Application generators Microprocessors, Relational databases Spreadsheets, VLSI	Online enquiring. professional databases. management informal systems. integrated lest and data processing. Transaction clearing systems. professional problem solving. Materials planning. Slock control.
5	1 ')8(ls	Teleconferencing Local area networks (LANS), Cellular radio. Wide area nctwork(WAN) Private sale Miles, Integrated service digital ne [works. Personal telephones	Portable computer, local languages. optical storage, expert systems. transputer, voice rccognilion. Dataflow processors, Wafer integration	Scheduling, Electronic mail. Teleconferencing, Computer Aided Design (CAD) Computer aitied manufaclure (CAM), Computer aided diagnostic. Remote sending devices
	1 WUs	Switched wideband services. Value added networks (VANS)	Gallium arsenide Chips, parallel processing. learning capability. Natural language recognition. Optical Chips Biochips	
	200(1	Personal mobile communication via satellites	Utra-mtclligent machines.	f

With the above development, a new concept ICT (Information Communication Technology) was born. Laudon et al (1994), stated that information technology and systems include all the different means, methods and tools that human have used throughout history to help manage information, conduct business, communicate with others and better understand the world. Information technology embraces all modern systems for processing information and communication in data, text, image and voice. In fact, information technology is the marriage between computers and telecommunication. Butcher (2003), stated that ICT is electronic technologies for collecting, storing processing

and communicate information. It can be separated into two main categories:

1. Those which process information, such as computers and
2. Those which disseminate information such as telecommunication system.

The Place of Computer in Library Service

Computer has gradually come to be incorporated with library science. Awana (1997), described library science as the knowledge and skill concerned with the collection, organization, dissemination of knowledge and the maximization of the flow of information to promote educational process, accelerate the translation of knowledge, preserve the cultural heritage of the society and ensure the transfer of knowledge from generation to generation. The impact of computer on library' science has led to the development of automated library as well as virtual library. Daniel (2002), defined virtual library as library in which computer and telecommunication technologies make access to a wide range of information resource possible. This same concept is referred to variously as digital or electronic library or library without walls. The virtual library is a child -of necessity arising from the need to use technologies in accessing the world information overload or information explosion for human survival and development. The comparative state of library without computer is made with that, with computer i.e. Traditional Libraries Vs Virtual as presented by Dike (2002),

A Table Showing a Comparison Virtual and Traditional Libraries between

No.	Library Services	Traditional Library	Electronic L!brar>
1	Opening hours	Limited	Round -t he-clod
2	Student	Not possible	Possible
3	Services to non-traditional students	Grossly limited	Online delivery
4	Access in resources	Limited to shelf search in physical location.	Instant/simultaneous *sri* electronic
5	Search engines	Manual anil tedious	Electronic easy ait extension
6	Seating and shell'	No savings	No seating required
7	Time factor	Does not save time in fact, waste time	Significant saving; ">: risk or travel timr required.
8	Manpower required	High	Low
9	Multiple access	Not flexible	Easy ami cheap
10	Resource sharing	Inconvenient, slow turn around time.	Convenient, fast turn around time.
II	Migration	Limited	Use the intemci :: access other libraries and materials.

Implications of Computer Science for the Growth of Education in Nigeria

The growth of education in Nigeria has received strong positive influence. This . is evident in the patterns of teaching and learning already prevalent in Nigeria today. Many students now have their personal computers with which they now carry out their studies. Students now carry virtual materials with available electronic storage media as diskettes, flash disks and CD-ROMS. With these media they collect learning materials from the websites and download such into their computers for further study. The patterns of dissemination of information and knowledge have equally changed with emergence of computers. Computer Assisted Instruction (CAI) packages are now commonly used by students and teachers thereby benefiting from advantages of CAI. With student-centred pattern of learning, the growth of education in Nigeria has surely received a boost. School administration is quite easier and more effective with the use of computers. School results are now often ready within a short period after examinations. Portals are now being developed in Colleges and Universities to enhance effective handling of the enormous workload in the institutions in Nigeria.

Libraries are now becoming more and servicing as she now gain patronage from students who now enjoy the benefits of automated or virtual libraries. Retrieval of needed study materials now become so simple that students spend more of their time studying rather than spending such time searching for materials as was the cases of traditional libraries.

Recommendations

The authors have watched with great disappointment the level of awareness and acceptance of this wonderful discipline, computer science, by Nigerians. Many have continued to shy away from the knowledge of computer science. We therefore, make the following recommendations:

1. The knowledge of computer science should be disseminated at the school foundation level.
2. Competent teachers should be employed and motivated to bring this knowledge to the masses.
3. The government, and non-governmental bodies should join in ""the eradication of computer illiteracy by providing necessary infrastructures and manpower toward the realization of computer literacy in Nigeria.
4. The scientist (computer scientists) should not rest in their oar in improving the quality and standard of computer hardware and software.

Conclusion

At this juncture, it suffices to say that the state of computer science has been that of a rapid progressive science. It is really a product of deep reasoning which have librated all study areas. Computer applications have continued to spread such that there is no single discipline or human endeavour that have not felt the impact. What is more, better computers and better uses of the computers are being unfolded to human race day by day.

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