

**INFORMATION AND COMMUNICATION TECHNOLOGY APPLICATIONS  
IN ACADEMIC AND RESEARCH WORK**

**By**

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**Abstract**

The paper revisited the essence of ICT application in academic and other environments and why the academics and researchers need it to meet up to expectation. The place of Internet in academic and research work has been lighted as well as the requisite knowledge and skills needed to exploit the ICTs and more particularly the Internet. It concludes that academics and researchers need to acquire some knowledge and skills of ICTs and Internet use to exploit them to their advantage.

**Introduction**

Information and Communication Technology (ICT) can simply be referred to as the integrated computer and telecommunication technologies. The integration of the two technologies could be said to be borne out of the need to enhance efficiency and effectiveness of data and information capture, process and transfer without limitation to location and time. The integration of the two technologies is made easily possible due to the seeming similarity of the capability and ability of the systems and facilities of the technologies. For instance, a computer system has the capacity and ability to perform calculations on numerical data and also manipulate other forms of information using a set of instruction (programmes) for easy access either at stand alone or in network environment. Whereas telecommunication system has the capacity and ability to facilitate the transfer and receipt of information in form of words, sounds, pictures or even data in the form of electronic signals or impulses sent either as an individual or set of messages between two or among members of a target audience irrespective of their location. Considering the functionality of the two system independent of each other there is no doubt in the fact that an integrated system or device with a combined capability and capacity of the two systems will certainly facilitate the execution of human tasks and efforts. This is especially as it relates to the processing and manipulation of data and information of any form, their transmission and reception irrespective of the location of the source and the receiver and the time of processing and transmission. Hall (1991) remarks that in all areas of life Information Technology (IT) is becoming increasingly important.

In an academic environment and indeed in any other type of environment, ICT facilities and devices are useful tools needed to facilitate:

- **Communication** - using computers and computer programs packages such as word processing, desktop publishing, graphics and telecommunication devices such as telephone and facsimile to communicate information far and wide
- **Data processing** – using spreadsheets and other numerical processing packages, data bases and communication devices for data processing and transmission especially in electronic format
- **Problems solving** – using computer and communication systems to facilitate task performance, inventory control, operations, monitoring and evaluation of production, processes and services delivery
- **Office and systems maintenance** – using computer and communication systems for creation and maintenance of databases, correspondences, supervision and services provision.

Some of the ICT devices readily available to perform the above basic functions include computers, facsimile, fixed and wireless telephone, digital camera, digital projector, television set, radio set, satellite communication system (Vsat), etc. Thus, the choice of which type of ICT devices needed to perform any of the above functions especially in an academic environment, in an organizational set up and at individual level will largely be a function of:

- What type and nature of data or information is available for capture, processing and transmission?
- What type of ICT device is affordable for acquisition and use?
- What type of audience is involved?
- What is the nature and characteristics of the environment in focus?

- What type of project/task is to be accomplished?
- What is the time frame required for the execution of the project/task at hand?
- Who are the major role players and stakeholders involved in the planning, financing, management and execution of the project/task?

Answers to the above basic questions point to the fact that an average academic and researcher, the individuals, the employers of labour and the employers need some ICT devices, as well as some knowledge and skills on how to effectively and efficiently utilize them to survive the exigencies of the time and make meaningful contributions to knowledge and to the overall societal growth and development.

Essentially, the 21<sup>st</sup> century academics and researchers will need ICTs and some appreciable knowledge and skills on how to effectively utilize them in order to:

- Communicate between and among researchers and academics
- Collect and process data
- Prepare lecture notes as well as conference, seminar and workshop papers
- Write research proposals and reports
- Maintain inter-personal communication in-between and among staff and students
- Maintain correspondences and other off-line and on-line services delivery within and outside work place.

Some of the ICTs needed by contemporary academics and researchers to succeed in their jobs include:

- Radio and Television sets
- Fixed and wireless telephone sets

- Tele fax machine
- Computer set
- On-line data bases
- Electronic journals, books and other relevant publications, and the
- Internet and other forms of electronic information network connectivity

### **The Internet**

One of the outstanding ICT facilities which contemporary academics and researchers will not succeed in doing without it is the Internet. This is simply a set of computer networks operating on a common standard (Transmission Control Protocol/Internet Protocol: TCP/IP) to facilitate easy communication of information and transfer of electronic data and files among themselves directly. Electronic transmission mediums such as optical fibre, copper wire, telephone lines, radio and microwave channels and modems are used in the construction of Internets and internet connectivity.

Some of the Internet services useful to the academics, researchers, and organizations include:

- **E-mail** – it allows easy communication exchange and transfer of data, electronic files, pictures, information and messages far and wide between or among the users through computer. It is useful for creating collaborative groups of users through the use of e-mail special accounts called “reflectors” or “exploders” that distribute mail sent to addresses automatically.
- **The World Wide Web.** It allows for the seamless creation and use of point-and-click hypermedia presentations linked across the Internet to create vast open knowledge repository for easy browsing. It can be referred to as the

library of resources available to computer users through the global network. It allows the users view a wide variety of information, journal and magazine archives, public and institutional library resources, current world affairs, business news, discoveries, etc with the aid of hyper text and hyper media.

- **Gopher** - It is a system that allows the computer users find servers and files on the Internet. It presents menus and submenus that users can select to specify their searches. Essentially, it allows for the creation and use of directories of files held on the computers on the Internet and build links across the Internet to allow users browse through the files. Its menus change as the resources available to the system change.
- **File Transfer Protocol (FTP)**. It is a set of conventions/rules that allow easy transfer of files between host computers. Its part of the TCP/IP that enables different types of computers and networks on the Internet to communicate. This is the most utilized service of the Internet especially for the distribution of files to different sites.
- **Usenet** - it is a world wide computer network that facilitates global distribution of news and messages automatically among thousands of user groups (news groups). It allows for the exchange of news, comments, and observations on specific topics
- **Telnet**. It is a system that allows a user to 'log in' to a remote computer and make use of it. That is, it is a set of protocol or procedures that enables the user of one computer on the Internet to log on remotely to any other computer using a password.

## **Internet Access**

The extent to which an Internet user effectively utilizes the Internet facilities and services can be a function of which method of access to the Internet is adopted by the Internet Service Provider (ISP) and the internal arrangement made at to service station to access the Internet. Any of the following methods of Internet access can be adopted to access the Internet.

- **Host Access:** This is through the use of dial-up telephone lines and modem combined with Internet software on a PC to allow the computer that is accessed to function fully as an internet host.
- **Network Access:** Like the Host Access, it is done through a leased line or an ‘always-on” (dedicated) line such as the Digital Subscriber Line (DSL) or Ether loop whereby all the computers attached are made into Internet Hosts. In recent time, the Asymmetrical Digital Subscriber Lines (ADSL) technology which enables high speed data to be carried between modems located at the customer site and local telephone exchange via the twisted pair copper local loop normally used for telephone calls are used. The ADSL uses all the available bandwidth in the local loop cable to achieve much higher speeds of up to 6 Mbps as against the normal 60kps.
- **Terminal Access:** This is done through dial-up telephone lines and modem connected with terminal emulation software on a PC to allow interaction with another computer that is on Internet Host.

- **Gateway Access:** Like the terminal access, its provided through on-line or similar proprietary services that gives the user the ability to exchange e-mail with the Internet.

### **Knowledge and Skills Requirement for Internet Facilities Use**

From all indications, the use of Internet is a must for the success of an academic or researcher due mainly to the rich information resources available for use both online and remotely. However, the level of utilization of the Internet resources and services is largely a function of the extent to which the user acquires the necessary knowledge and skills for its effective and efficient use. Some of the knowledge and skills required for effective and efficient use of Internet facilities and services include:

1. **Computer applications** especially for word processing, data processing and database construction and management, and creation and management of files and folders
2. **E-mail:** useful for transmitting, exchanging and receiving electronic messages and information between or among computers in a network or stand alone environment. It is the fastest means of sending and receiving messages as the action and reactions of sending and receiving the messages are spontaneous. To use e-mail, one needs a computer, telephone line, a modem and an Internet Service Provider (ISP). The user acquires among others the knowledge and skills to:
  - Set up an e-mail account/address with Internet Service Provider or Internet Gateway e.g. [dankali@yahoo.com](mailto:dankali@yahoo.com)
  - Access, read, write and print message



- Create, open, add to, and close files and folders
- Delete and undo deleting message, file and folder
- Check the spelling of outgoing message
- Display or view message, file and attachment contents
- Reply or send messages with or without attachments
- Downloading and uploading messages and files
- Move, copy, cut, paste and merge messages or files to another
- Open more than one files conveniently in the mail box
- Performing other word processing activities in the mail
- Check for new messages and deliver outgoing messages immediately
- Use Hypertext Transfer Protocol (HTTP) and Hypertext Markup Language (HTML) formats for sending and saving messages
- Change a font type, style and size of a selected text
- Create a bulleted list
- Understand Internet terminologies/technical terms

The famous e-mail services are the yahoo.mail.com and Hotmail.com

**3 Search engines** – computer software that computes the lists of documents and their contents most commonly on the web (www). They respond to users' query or entry by searching the lists and display a list of documents (web sites on the web) that match the search query. The famous global general purpose search engines include:

- ❖ Google
- ❖ Yahoo
- ❖ MSN search

by the data they were posted. A blog can be owned by more than one individual such as a team of academics or researchers.

Unlike newsgroups, message boards and bulletin boards, web logs are free and require no hosting space to be set up. Its subscription is similar to that of e-mail services such as Yahoo, and Hotmail. Though people companies now incorporate Hogs into their websites so as to allow for personalize service in general (eg appearance, indexing, etc). The two common blog servers are [www. Blogger.com](http://www.Blogger.com) and [www.iblog.com](http://www.iblog.com)

An academic or researcher may use blog to post a result found in the course of research, or the progress report of the research itself.

A blog owner can set, read or give writer privileges to other users visiting the blog thereby allowing the permitted visitors to view, and add commentary to a posted topic of their interest.

### **Conclusion**

The ICT has created an enabling environment for facilitating academic and research work through its capacity and ability to enhance communication, data processing, information transfer and access without limitation to the user's or seeker's location and time. What is therefore required of the 21<sup>st</sup> century academic and researcher is to acquire some necessary knowledge and skills of ICT use so as to make the best use of its facilities and systems; and more particularly the Internet which is a global reservoir of information resources, sources and services.

### **Reference**

Jenny Hall and Jill Smith (1991) Information Technology for all. London: McGraw-Hill Book Company, P.V.

- ❖ Alta Vista
- ❖ Lycos
- ❖ Hotspot

More than one search engine can be used by a user to get a wider range of sites, databases, etc relevant for use. It is therefore necessary to know how to search for any information from the Internet using any of the search engines. Other necessary knowledge and skills required to make the best use of the search engines include:

- Browsing websites
- Downloading files and documents
- Uploading files and document
- Search strategy, especially Boolean logic, Truncation and phrases
- Copying files and documents
- Transferring files and documents
- Archiving files

The general approach to searching all directories is:

- (a) keep search terms broad, the concept, the discipline, the broad subject, what its all about
- (b) if searching does not work, try browsing subject categories
- (c) look for alphabetical list of all subject categories or an expanded list

**4 Browsing and Navigating** – Browsing is the act of viewing and moving about between documents or computer networks; whereas navigating is the process of virtual travel between websites. An Internet user should be able to log-on large open-access network (Internet) browse through documents/files (internet) and closed network

(intranets) public-access network. In any case, it should be noted that a browser (a computer programme) enables a computer to locate, download and display documents containing text, sound, video, graphics, animation and photographs (hypertext and hyper media) located on computer network(s). Browsers normally:

- allow users access to Web information by locating documents on remote computers that function as Web services;
- download information over phone lines to a user's computer view the modem or other forms of connections and display the information on the computer; display hyper texts and hyper medias;
- create impression of traveling to an actual location in virtual space (hype space) where it is being viewed;
- has the ability to designate a web site to which the browser opens with each use automatically;
- has the option to create directories of favorite or useful sites;
- allow access to search engines;
- and has the ability to screen out certain types of information by blocking access to certain categories of sites. Some of the commonly used browsers include:

- Netscape Navigator
- Internet Explorer
- Mosaic
- Opera

More often than not, the choice of which browser to use is a function of its performance, capability and ability which is predicated on:

- The speed and efficiency of the user's computer
- The size and complexity of the browser Programme
- The compatibility of the browser with the host computer's operating system
- The type of modem being used
- The bandwidth of the data transmission medium (ie the amount of information that can be transmitted per second).

5 **User Group** – a group of people with common interest drawn together to form a forum for showing and exchange knowledge, ideas and experiences via a computer network system such as the Intranet, internet and Internet. Thus, it is necessary to acquire the knowledge and skills of creating, supporting, joining, maintaining and participating in user group activities.

6 **Usenet**: A world wide computer network accommodating thousands of discussion groups (news groups) to allow for uploading articles and exchange of news, comments, questions and enquiries on specific and/or general topical issues especially via the Internet. Ability to utilize the news group initiative will largely depend upon the user's ability to effectively use the computer system especially for word processing as he/she is expected to be able to write and post questions, articles, news, comments, or read and respond to such postings left by other users on the Internet and other networks.

7 **Weblogs**: a weblog, commonly shortened 'blog', can simply be described as an online journal or diary accessible by those permitted but editable duly by the owner. It is an Internet service/feature/tool which allows its owner to make entries which are grouped

by the data they were posted. A blog can be owned by more than one individual such as a team of academics or researchers.

Unlike newsgroups, message boards and bulletin boards, web logs are free and require no hosting space to be set up. Its subscription is similar to that of e-mail services such as Yahoo, and Hotmail. Though people companies now incorporate Hogs into their websites so as to allow for personalize service in general (eg appearance, indexing, etc). The two common blog servers are [www. Blogger.com](http://www.Blogger.com) and [www.iblog.com](http://www.iblog.com)

An academic or researcher may use blog to post a result found in the course of research, or the progress report of the research itself.

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