THE ROLE OF THE INTERNET IN INFORMATION DISSEMINATION

N. D. Oye

Abstract

This paper examines the role of the Internet in information dissemination. The Internet, no doubt, offers individuals and organizations almost unlimited access to information and with this information, a proliferation of services. The Internet has a myriad of services including the E-mail, WWW, E-Commerce etc; these are discussed in this paper. For convenience, this article is divided into five sections, the introduction, evolution of the Internet, how to get on the Internet, how information is transferred on the Internet and services and resources of the Internet. Finally, the future of the information super-highway was examined and discussed thoroughly. Some of the future problems discussed are: the difficulty of providing enough bandwidth to sustain the network, the issue of censorship and the issue of security in the case of business transactions.

Introduction

Information is that which affects our behaviour, moods, views and interactions. Information is the most basic resource in today’s society. The Internet also called the information super-highway, has changed and is continually changing the ways of interactions, mood and behaviour. The Internet offers individuals and organizations almost unlimited access to data, and with this information, a proliferation of services.

What Is The Internet?

Imagine a room filled with many spiders, each spinning its own web. The webs are so interconnected that the spiders can travel freely within this maze. You now have a simplified view of the internet. It is a global collection of many different types of computers and computer networks that are linked together. Just as a telephone enables you to talk to someone on the other side of the earth who also has a phone, the Internet enables a person to sit at his computer and exchange information with other computers and computer users any place in the world. The Internet - also called the Net, is the world's largest computer network, a linkage of computers through communication hardware of copper wires (cables), fibers optic lines, satellites etc.

The Internet has a myriad of services to offer including the electronic mail (e-mail), the world wide web (WWW), electronic commerce (e-commerce), etc. Just as roads allow travel through different areas of a country, so the Internet allows information to flow through many different interconnected computer networks. As messages travel, each network that is reached contains information that assists in connecting to the adjacent network. The final destination may be in a different city or country. Each network can “speak” with its neighbour network by mans of a common set of rules created by the Internet designers. According to recent surveys these networks connect over 10,000,000 computers and some 30,000,000 users throughout the world. The whole concept is on information retrieval and exchange (Walsh, 1991).

What Can People Locate On The Internet?

It offers a rapidly growing collection of data with topics ranging from medicine to science and technology. It features exhaustive material on the arts as well as research material for students and coverage of recreation, entertainment, sports, shopping and employment opportunities. The Internet provides access to almanacs, dictionaries, encyclopedias and maps. For convenience, this article is divided into five sections, the evolution of the Internet, how to get on Internet, how information is transferred on the Internet and service and resources of the Internet. The purpose of the paper is to examine the future of Internet services.
Evolution Of The Internet

The Internet was born during the Cold War between the East and West, particularly between the U.S.A. and the former USSR. Both were pursuing gigantic space research programs aimed mainly at military domination of the world. By 1957, the Soviets launched a spacecraft called the Sputnik. (Oloruntoba, 1997). The USA on its part was busy developing a sophisticated communication system. This system now known as the Internet which began as an experiment by the US Department of Defence in the 1960s to help scientist and researchers from widely dispersed areas work together by sharing scarce and expensive computers and their files. This goal required the creation of a set of connected networks that would act as a coordinated whole. The Cold War generated interest in a “bombproof network. If a part of the network were destroyed, data would still travel toward its destination with help from the surviving parts. In the resulting Internet, the responsibility of message routing was thus spread throughout the network instead of being centered in one location.

The Soviet’s successful launching of the spacecraft embarrassed and humiliated the USA who was suppose to be heading the world in the space programme. The US Department of Defence, later in 1969, funded a project called the Advanced Research Project Agency (ARPA).

The ARPA applied its funds to basic research in the application of computers to all aspects of communications development rather than the military defence only. This was a blessing in disguise, because it enabled a collaboration effort between military scientists, University scientists and other organizations in the private sector of the US economy. In this program, they employed Mainframe Computer - a large, fast multi-user computer system designed to manage very large amount of data and very complex computing tasks, and linking them to a network for maximum usage by all the researchers involved. They called this ARPA Net. According to Oloruntoba (1997), it was the ARPA Net that metamorphosed into the Internet.

The ARPA Net quickly grew to span the entire continent. The reliable networking involved dynamic routing in which if one of the links becomes disrupted, the traffic on it could be rerouted automatically to other links by a technical scheme called the Internet Protocol (IP). A protocol, in networking and communications is a specification that defines the procedures to follow to recognize the presence of each other. The IPs later led to the development of gateways. When a gateway, as explained earlier, is a shared connection between two incompatible networks. According to Oloruntoba (1997) the application of computer technology to communications and information transmission became very important part of the ARPA Net research. Information transmission, they argued, will be the major plan in conquering and domination of space, and it would also become very useful for business, commerce and national development as it is now.

The military, later, took the space research aspect out of ARPA into a new body called National Aeronautics Space Administration (NASA). However, ARPANet remained and continued to develop through private initiative and efforts to become an important global network for communications that we only have the Internet. However, before the actual Internet, some commercial companies had formed smaller network groups of computers to provide what they called “on-line services”. These groups, which are national in form and organization, provide mainly electronic mail (e-mail), communication services to members subscribing to them. The term Internet first appeared in 1982, with ARPA’s launch of the Internet Protocol (IP). With time, Internet facilities like the world wide web (www), Eeectronic commerce (e-commerce), etc were developed. Newer technologies are underway.

How To Get On The Internet

The Internet is a growing group of about 120,000 separate networks hooked together, each with its own procedures and rules (Levine et al, 1997). There are basically two (2) different ways to connect a computer, and consequently, many computers to the internet.

1. Use a modem - Contraction of modulator/demodulator, a device that allows a computer to transmit information over a telephone line to an Internet Service Provider (ISP), or
2. Use a network Interface Card or network card (NIC) - a pc expansion board that plugs into a computer or server and works with the network operating system to control the flow of
The Role Of The Internet In Information Dissemination.

information over the network, to connect to a personal and private computer network called a Local Area Network (LAN), and then connect the LAN to the Internet, that is if the LAN is not already connected to the internet.

It is apparent from the next figure below, that the pre-requisite for Internet access are, a computer, a modem, a telephone line, and an ISP. There are myriad of types of computer and the higher the capacity and speed of a computer and the modem and the telephone line, the faster the access, the same is also applicable for the ISP. Modems and Network adaptors are the two most common computer communications technology that transmit data to and receive from other computers.

In networking, a repeater is a simple hardware device that moves all packets from one LAN segment to another.

Its main purpose is to extend the length of the network transmission medium beyond the maximum cable lengths. A router is a connecting device that sends packets to the correct LAN segment to take them to their destination. A hub is basically a central controlling device in a star-network - a network topology in the form of a star.

![Diagram of network connections](image)

Fig: 1 Difference Between Connection and Modem Connection
(Adapted from: Coombs & Coombs (1997), Page 3).
Since all computers on the Internet rely on IP, a computer can either speak IP through a modem or through a network adaptor. If a computer speaks IP through a network adaptor, information packets are “carried” on top of another networking protocol such as Ethernet - a popular network protocol and cabling scheme with a transfer rate of 10 Mbps, originally developed in 1976; if a computer speaks IP through a modem, information is “carried” on top of a networking protocol designed to work with modems such as PPP/SLIP or SHELL access - schemes for connecting a computer to the Internet over a phone line, PP (Point to Point Protocol) is faster than its predecessor SLIP (Serial Line Internet Protocol) and much more flexible than SHELL protocol.

Again, since various brands of computers and operating systems exist, the procedure for connecting to the Internet with regard to computer types is beyond the scope of this study. However, useful reading may be found in Revine et al (1997) and Combs and Combs (1997).

How Information Is Transferred On The Internet

This word Internet is a contraction of internet working, which means to link many networks. The computer attached to one computer network can communicate with the computers that are attached to another computer network, if both computer networks are part of the global Internet. Information moves across the Internet in small unit called packets. Each packet contains a header which in turn comprises the packet’s identification number and information about its origin and destination. Primarily, a packet really is just a series of ones and zero transmitted across fiber optic cables, copper wires, or radio waves etc.

A packet may be viewed as a tangible package full of information. As packets-chopped information into byte-sized pieces called bytes, are sent. What is primarily important is that, the packets arrive at their destination and are reassembled into their original form. These packets are channeled to route from one Internet site - a collection of computers that are all permanently connected to the Internet, to another by data communication equipment and routers - a hardware that connects two networks that use the same protocol, allowing transfer of data between them, it is stressed that every device that is connected to the Internet is not a computer, these devices are called network nodes. Consequently every computer on the Internet is a network node, but not every network node on the Internet is a conventional computer. Many, but not all, computers on the Internet “Speak” IP directly. Other computers speak a different networking language and rely on translation equipment to convert IP and other employed network language (Coombs & Coombs, 1997).
In summary, the following flowchart suffices to suggest how to connect to the Internet.

**START**

- If there a Computer Network At your Site
  - Y
  - Is the network linked to the Internet Or can it be linked?
    - Y
      - Choose an ISP
    - N
      - Is your Computer suitable?
        - Y
          - Do you have suitable Modem?
            - Y
              - Do you have suitable Software?
                - Y
                  - Log in and Use the Internet
                - N
                  - Obtain it
            - N
              - Obtain One
        - N
          - Upgrade or replace your PC
  - N
    - Ask your network Administrator to Link you.

Fig. 2: How to get on the Internet (Source: Walsh (1998) page 10)
Services And Resources Of The Internet

Any computer that provides information or services to other computers is a server, whereas, any other computer that uses the services of a server is a client. According to Coombs & Coombs (1997), only those people who have an Internet site have computers called servers and all other have computer called clients. The Internet must always have fewer servers than clients just as the world must have fewer companies than customers. A common resource provided by the Internet is a worldwide system for sending and receiving electronic mail, known as e-mail. Indeed, e-mail represents a large portion of all Internet resources they use.

How Does It Work?

To answer this question, let’s review the ordinary mail system first. Imagine that you live in Lagos and wish to send a letter to your daughter living in Yola. After properly addressing the envelope, you mail it, starting the letter’s journey. At a post facility, the letter is routed to the next location, perhaps a regional distribution center, and then to a local post office near your daughter.

A similar process occurs with e-mail. After your letter is composed on your computer, you must specify an e-mail address that identifies your daughter. Once you send this electronic letter, it travels from your computer, often through a device called a modem, which connects your computer to the Internet via the telephone network. On its way, it goes, bound for various computers that act like local and national postal routing facilities. They have enough information to get the letter to a destination computer, where your daughter can retrieve it.

Unlike the regular mail, e-mail often reaches its destination, even on other continents, in minutes or less, unless some part of the network is heavily congested or temporally out of order. When your daughter inspects her electronic mailbox, she will discover your e-mail. In summary, if a computer is permanently connected to the Internet arriving mails are automatically delivered to the computer. If otherwise, the mails get delivered to a server. To get a mail, a mail program (Client program) has to get to a mail server and fetch the mail. The same applies while sending if the computer is not permanently connected to the Internet. There is quite a number of mail programs existing.

The World Wide Web

The part of the Internet called World Wide Web (WWW or Web) allows authors to use an old-fashioned idea—that of footnotes, in a new way. When an author of a magazine article or a book inserts a footnote symbol, we scan the bottom of the page and are possibly directed to another page or book. Authors of Internet computer documents can do essentially the same thing using a technique that will underline or highlight a word, a phrase, or an image in their document. The highlighted word or image is a clue to the reader that an associated Internet resource, often—another document, exists. This Internet document can be fetched and displayed immediately for the reader. The document may even be on a different computer and located in another country. David Peal, author of Access the Internet, noted that this technique “Links you to actual documents not just references to them”.

Levine et al (1997) said that people today talk about the WWW at least as much as they talk about the Internet. The Internet is the core of the WWW and WWW lives “on top” of the Internet. The WWW is a bunch of pages of information connected to each other around the globe. Each page is a combination of text, pictures, video clips, audio clips, and animations etc. What makes web pages interesting is that they contain hyperlinks.

Each link refers to another Web page and when one activates a link, a browser—a software program, specifically a client program, that accesses the WWW pages, fetches the page the link connects to. Pages may be linked to other pages any where in the world.

The above-explained system of hyper linked documents is known as hypertext—a way of connecting information in ways that make it easy to find. Dyson (1994) states that hypertext was designed to make a computer respond to the non-linear way that human think and access information—which association rather than the linear organization of lines, books, and speech. As one draws connections between pieces of information, a web may be envisaged.

The Role Of The Internet In Information Dissemination.

How The Web Works
The WWW is based on a communications protocol and a page layout language. The protocol is called HTTP (Hypertext Transfer Protocol). HTTP is a set of commands that a WWW client uses to make request of a WWW server.

The client programs are usually called browsers. The page layout is the HTML (Hypertext Mark up Language). HTTP takes care of transferring Web pages across the Internet from server to client; HTML makes sure that users can view the pages in any browser. HTML is the cooling syntax for writing WWW pages. According to Levine et al (1997) HTTP and HTML are the initial foundations of the WWW as an idea, within a concept, wrapped in a language on top of a standard where URL (Uniform Resource Locator) is the idea, concept is hypertext, language is HTML, and standard is HTTP.

Surfing The Net
By using a Web browser, a person can easily and quickly view information and colourful graphic that may be stored on computers in many different countries. Using a Web browser can be similar in some ways to actual travel. This ability to move nimbly back and forth from one Internet Web site to another is commonly called surfing the Net. Business and other organizations have become interested in the Web as a means to advertise their products or services as well as to offer kinds of information. They create a web page, a sort of electric store-front window.

Once an organization’s Web page address is known potential customers can use a browser to go “shopping” or information browsing. As in any market place, however, not all products, services or information provided on the Internet are wholesome.

Chat
Another common service of the Internet is the Internet Relay Chat or Chat. Chat allows a group of people, using aliases, to send messages to one another immediately. While used by variety of age groups, it is especially popular among the young people. Once connected, the user is brought into contact with a large number of other users from all around the world. Chat channels are created that feature a particular theme, such as science fiction, movies, sports, or romance. All the messages types within a Chat room appear almost simultaneously on the computer screens of all participants for that Chat room.

News Groups
Another popular service is called Usenet. Usenet offers access to newsgroups for group discussions on specific topics. Some newsgroups focus on buying or selling various consumer items. There are thousands of newsgroups, and once a user has gained access to Usenet, there is no cost to subscribe to them.

Let’s imagine that someone has joined a newsgroup involved in stamp collecting. As other subscribing to this group sends new messages about this hobby, the message becomes available to this newcomer. This person reviews not only what someone had sent to the newsgroup but also what others have written in response. If, for example, someone request information about a particular stamp series, shortly afterward there may be many responses from around the world, offering information that would be immediately available to all who subscribe to this newsgroup.

File Sharing And Topic Searching
One of the original Internet goals was global information sharing. A teacher in one part of world may lactate another educator on the Internet who is willing to share already developed course materials. Within minutes the files are transferred, despite vast distances between them. Just as we locate phone number by using a telephone directory, a user may find locations of interest on the Internet by first gaining access to what are known as search sites. The user supplies a word or a phrase, the site then replies with a list of Internet locations where information can be found. A farmer might have heard of a new technique called precision farming, which uses computers and satellite maps. By entering that phrase
as a search site, he can find names of farmers who are using it, as well as detailed information about the method.

The Future Of The Internet

A major challenge facing the continued growth of the Internet is the difficulty of providing enough bandwidth to sustain the network. The amount of data that a computer network can transmit is called the bandwidth of the network and is usually measured in Kilobits per second (Kbps) or Megabits per second (Mbps). As Internet applications become more sophisticated, and as more people around the world use the Internet, the amount of information transmitted across the Internet will demand very high bandwidth connections. While many communications companies attempting to develop higher bandwidth technologies, it is not known whether the technology will be able to satisfactorily keep up with demand.

In order to accommodate the increasing number of users, the non-profit organization University Corporation for Advanced Internet Development (UCAID) is working on the construction of Internet 2. Internet 2 will add more bandwidth, or available communication lines, to the current information superhighway in order to accommodate larger packets of data. UCAID members include representatives from Universities, the government, and the computer industry. Another important question facing Internet growth is the issue of censorship. Because the Internet has grown so rapidly, governments have been slow to regulate its use and to pass laws regarding what content is acceptable. Many Internet users also see such laws as an infringement on their right to free speech, in 1996 the Congress of the United States passed the Communications Decency Act, which made it a crime to transmit indecent material over the Internet. This decision resulted in an immediate outcry from users, industry experts, and civil liberties groups opposed to such censorship. In 1997 the United States Supreme Court declared the act to be unconstitutional because it violated first Amendment Rights to free speech.

Commercial use of the Internet is sure to grow dramatically as more individuals gain access to it. It may be possible in the future to order nearly any goods from Internet sites and have them delivered using the postal service. Many companies are worried about security issues and the possibility of losing money through Internet commerce. They are therefore being very cautious about doing business on the Internet commerce. Other businesses, however, are embracing the Internet, hoping to be first in what may be a rapidly expanding market.

The issue of business being conducted over the Internet raises important security issues. Companies doing business over the Internet must have very sophisticated security measures in place so that information such as credit card, bank account, and social security members cannot be accessed by unauthorized users. Similarly, government facilities, universities, and institutions must ensure that access to their computers over the Internet is strictly regulated.

References

Coombs, J. and T. Coombs Setting up on Internet Site for Dummies 2nd Ed. IDG Books World Wide Inc, California, USA.
Levine, R. J. C., Barondi, and M. L. Young. The Internet for Dummies, 4’t Ed. IDG Books Worldwide Inc, California, USA, 1996 - 97.