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## The History of the Internet



The Internet has a very long and interesting history consisting of many advances and improvements. The Internet is a technological explosion resulting from combinations of the telecommunication and computer fields. This combination led to its development and growth.

The Internet's computer routes began with the Difference Engine, created by Charles Babbage in 1833. The Difference Engine was a very simple computer that calculated math equations. The next advancement came in 1938 when the Z1 and Z2 binary computers came into existence. This provided the means by which the computer communicated with its components (Moschovitis 3-19).

The first telecommunication technology that led to the devolvement of the Internet was the telegraph; this caused the world to have a long ranged, fast and accurate means of communication and desire to create an even better means of communication. The next important development that led to the creation of the Internet was the telephone; this provided the means through which the Internet would communicate over. The last improvement came to computers in the form of the Modem, developed by Bell Laborites in 1958. The Modem provided the technology on how to convert analog (telephone communication) to digital (computer communication) (Moschovitis 8-43).

In 1957, the Internet got its first big boost in funding when the government of the United States of America increased its funding in its technological organizations for fear that the Soviet Union could destroy the infrastructure of the nations communications with a single well placed attack. The government also formed the Advanced Research Project Agency (ARPA), as an agency that decided to whom funding of the technological grants would be given. A few years later in 1969 ARPA established ARPANET to allow the

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government to communicate if the country was attacked and to not break down all communications between top officials. The original locations of the sites for ARPANET where to be the University of Utah, the Sanford Research Center and the University of California in both Los Angles and Santa Barbara (Wolinsky 11).

ARPANET was the brainchild of Lawrence G. Roberts who brought his idea of computer networking to ARPA in 1966. Roberts envisioned that ARPANET would have Interface Message Processors (IMPs), which would connect the sites of ARPANET, scan for errors and confirm the arrival of messages at a particular site. Roberts decided to prove to his superiors that networking was possible, so he connected his computer, the Q-32, in California with a colleague's computer, the TX-2, in Mass. over a telephone line. In the end he found out that the computers worked well together, but that a telephone line was inadequate in terms of speed (Leiner).

When Charley Kline at UCLA used ARPANET for the first time, it froze at the letter "G" in LOGIN on the Sanford Research Institute's site (Howe). When ARPANET finally began to operate properly, the government set ARPANET's goal as providing scientific researchers with a convenient, quick and inexpensive way to share resources across geographic distances. Finally in December of 1970 the Network Working Group (NWG) finished its host-to-host protocol, the Network Control Protocol (NCP), which allowed for the development of network applications (Leiner).

In 1973, work on a new protocol, Transmission Control Protocol (TCP) had begun. Robert E. Kahn and Vint Cerf designed the original version, and it was designed to include improvements upon the computer communications technologies of the time. The first improvement was that the protocol would be reliable when a packet, chunk of

data, was lost or corrupted. The second improvement was that it would address sites so that packets would easily reach their destination site. The final improvement of TCP over the other protocols of the time was that it would provide support to transporting packets to other operating systems (Leiner).

In July of 1977 the first version of TCP was completed and implemented. To show the feasibility of TCP a message was sent with TCP over a packet-radio host, a satellite network host and an ARPANET host without losing a single packet of data (Moschovitis 90). When TCP began to be used on network applications, Kahn realized that sometimes packets should not be retrieved again. For example, when a file is streaming and you only need most of the file and not the complete file, like a streaming movie. Kahn developed TCP/IP to meet this new demand. Kahn redeveloped his protocol into two parts, TCP and IP, Internet Protocol. TCP would handle the service features such as flow control and recovery from lost packets. IP would provide site addressing and forwarding of packets to the requested sites (Leiner).

In 1984 the Domain Name System (DNS), was implemented on several web servers to allow the use of names instead of numbers for the name of the web site. An example of this change is that if one would use the conventional naming system one would type 216.239.33.100 for the address of the web site, while today, with the DNS; one would simply type in the address www.google.com. This provided a major improvement over the older technology because it allowed for a user to more easily remember a site's address (Moschovitis 110-118).

Also in the late 1980s Indices where developed to keep track of all of the information on the Internet. Examples of popular Indices of the time are Archie and the Wide Area Information Server (WAIS) ("A Brief History of the Internet").

Next in 1991 an early web browser, Gopher, was developed at the University of Minnesota. Gopher's name was a joke as it was their mascot's species. Gopher allowed computer illiterate people to use the Internet to find information, due to its easy to use menus of suggested sites of information. Gopher was different on every computer, due to the nature of the service being hosted on a few different servers and each having its own links (Moschovitis 161-162).

The early web pages contained no pictures, sounds or movies; the early web pages also were text based. To follow a hyperlink one would have to type the number that correlated to the text that contained the hyperlink at the prompt at the bottom of the page (Wolinsky 38).

Finally the Internet took a turn in its users. In 1992 a commercial Internet Service Provider (ISP) named Delphi started to provide Internet services to its subscribers. Before this time the government's original intensions where kept in mind and only think tanks and government agencies received access to the Internet ("A Brief History of the Internet").

Eventually in 1993, Mosaic was invented. Mosaic was the first GUI, Graphical User Interface, browser to be available for surfing the Internet (Moschovitis 171-173). Mosaic was designed by National Center for Supercomputing Applications (NCSA) to be a patching of all of the current technologies of the Internet into one program, hence the name Mosaic (Wolinsky 40-41). In 1994 Yahoo! was created as a database of links of web pages to help people to find the information that they needed on the Internet. Later the employees of Yahoo! created a search application to find the information on their ever-growing list of links. After they invented their search engine AOL wanted to buy the Yahoo! search engine to keep their monopoly on search engines (Moschovitis 180-182).

Next a huge leap in web server technology occurred in 1995 with the invention of the Apache Web Server. The Apache Web Server was released as an open source application. An open source application is an application that is released in its original coded version so that anyone can edit the software for free to remove bugs or add more support for different computers. The Apache Web Server also let anyone who had an Internet connection and a computer with a UNIX operating system, be an Internet web page host. This led to an explosion in the number of pages on the Internet. Still today, most of the Internet's web pages are hosted by a version of the Apache Web Server (Moschovitis 202-203).

By 1996, the browser battle between Microsoft and Netscape had heated into a full-scale war. This battle had begun all the way back in 1994 when Microsoft had released Internet Explorer 3.0 for free in packages with other software to compete with Netscape Navigator which was sold to its users. To battle Microsoft, Netscape began to give away its browser for free and they also sent a letter to the federal government accusing the Microsoft Corporation of violating antitrust laws (Moschovitis 209-211). At this time the development of Windows 98 was under way, so the Microsoft Corporation decided to gain an edge on Netscape by intergrading Internet Explorer into their new operating system (Howe). Soon Microsoft realized that they would have to wait for their

new operating system to be completed, so they began to charge computer manufacturing companies extra if they offered Netscape Navigator and Internet Explore together on a machine. By the end of November of 1996, Microsoft's Internet Explorer had gained more than thirty percent of the browser market with their underhanded dealings to get rid of Netscape from the browser market (Moschovitis 209-211).

The modern Internet as we know it today was not endorsed more by any other politician than Al Gore. Al Gore helped to promote the Internet in the household. Al Gore obviously took his contribution to the Internet at a much higher caliber than his actual contribution by saying, "I took the initiative in creating the Internet" (Howe). Al Gore was not even elected to Congress when ARPANET was born. Luckily for Al Gore, Bob Kahn and Vint Cerf later acknowledged his contribution to Internet (Howe).

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