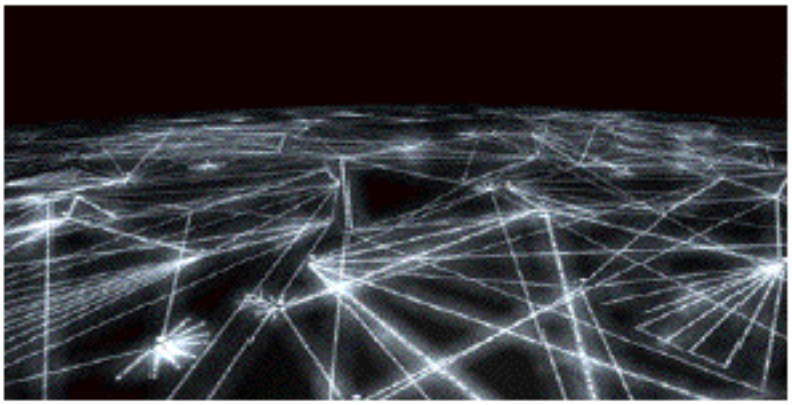
The Internet-An Anecdotal History

An anecdotal history of people & communities who brought about the Internet and the Web

The Internet was the result of some visionary thinking by people in the early 1960s who saw great potential value in allowing computers to share information on research and development in scientific and military fields. J.C.R. Licklider of MIT, first proposed a global network of computers in 1962, and moved over to the Defense Advanced Research Projects Agency (DARPA) in late 1962 to head the work to develop it. Leonard Kleinrock of MIT and later UCLA developed the theory of packet switching, which was to form the basis of Internet connections. Lawrence Roberts of MIT connected a Massachusetts computer with a California computer in 1965 over dial-up telephone lines. It showed the feasibility of wide area networking, but also showed that the telephone line's circuit switching was inadequate. Kleinrock's packet switching theory was confirmed. Roberts moved over to DARPA in 1966 and developed his plan for ARPANET. These visionaries and many more left unnamed here are the real founders of the Internet.

Who was the first to use the Internet?

Al Gore-former Vice President of



Internet Linking spanning the

Charley Kline at UCLA sent the first packets on ARPANet as he tried to connect to Stanford Research Institute on Oct 29, 1969. The system crashed as he reached the G in LOGIN!

The Internet was designed in part to provide a communications network that would work even if some of the sites were destroyed by nuclear attack. If the most direct route was not available, routers would direct traffic around the network via alternate routes.

The early Internet was used by computer experts, engineers, scientists, and librarians. There was nothing friendly about it. There were no home or office personal computers in those days, and anyone who used it, whether a computer professional or an engineer or scientist or librarian, had to learn to use a very complex system.

In 1974 the term Internet first came into use. Al Gore has probably done more than any other elected official to support the growth and development of the Internet from the 1970's to the present .

E-mail was adapted for ARPANET by Ray Tomlinson in 1972. He picked the @ symbol from the available symbols on his teletype to link the username and address. The telnet protocol, enabling logging on to a remote computer, was published as a Request for Comments (RFC) in 1972. RFC's are a means of sharing developmental work throughout community. The ftp protocol, enabling file transfers between Internet sites, was published in 1973.

The Internet matured in the 70's as a result of the TCP/IP architecture first proposed by Bob Kahn at BBN and further developed by Kahn and Vint Cerf at Stanford and others throughout the 70's. It was adopted by the Defense Department in 1980 replacing the earlier Network Control Protocol (NCP) and universally adopted by 1983.

In 1986, the National Science Foundation funded NSFNet as a cross country 56 Kbps backbone for the Internet. They maintained their sponsorship for nearly a decade, setting rules for its non-commercial government and research uses.

As the commands for e-mail, FTP, and telnet were standardized, it became a lot easier for nontechnical people to learn to use the nets. It was not easy by today's standards by any means, but it did open up use of the Internet to many more people in universities in particular. Other departments besides the libraries, computer, physics, and engineering
departments found ways to make good use of the nets--to communicate with colleagues around the world and to share files and resources.

While the number of sites on the Internet was small, it was fairly easy to keep track of the resources of interest that were available. But as more and more universities and organizations--and their libraries-- connected, the Internet became harder and harder to track. There was more and more need for tools to index the resources that were available.

The first effort, other than library catalogs, to index the Internet was created in 1989, as Peter Deutsch and his crew at McGill University in Montreal, created an archiver for ftp sites, which they named Archie. This software would periodically reach out to all known openly available ftp sites, list their files, and build a searchable index of the software. The commands to search Archie were unix commands, and it took some knowledge of unix to use it to its full capability.

McGill University, which hosted the first Archie, found out one day that half the Internet traffic going into Canada from the United States was accessing Archie. Administrators were concerned that the University was subsidizing such a volume of traffic, and closed down Archie to outside access. Fortunately, by that time, there were many more Archies available.

In 1991, the first really friendly interface to the Internet was developed at the University of Minnesota. The University wanted to develop a simple menu system to access files and information on campus through their local network. A debate followed between mainframe adherents and those who believed in smaller systems with client-server architecture. The mainframe adherents "won" the debate initially, but since the client-server advocates said they could put up a prototype very quickly, they were given

the go-ahead to do a demonstration system. The demonstration system was called a gopher after the U of Minnesota mascot--the golden gopher. The gopher proved to be very prolific, and within a few years there were over 10,000 gophers around the world. It takes no knowledge of unix or computer architecture to use. In a gopher system, you type or click on a number to select the menu selection you want. You can use the U of Minnesota gopher today to pick gophers from all over the World

Gopher's usability was enhanced much more when the University of Nevada at Reno developed the VERONICA searchable index of gopher menus. It was purported to be an acronym for Very Easy Rodent-Oriented Netwide Index to Computerized Archives. A spider crawled gopher menus around the world, collecting links and retrieving them for the index. It was so popular that it was very hard to connect to, even though a number of other VERONICA sites were developed to ease the load. Similar indexing software was developed for single sites, called JUGHEAD (Jonzy's Universal Gopher Hierarchy Excavation And Display).

The New Protocol

In 1989 another significant event took place in making the nets easier to use. Tim Berners-Lee and others at the European Laboratory for Particle Physics, more popularly known as CERN, proposed a new protocol for information distribution. This protocol, which became the World Wide Web in 1991, was based on hypertext--a system of embedding links in text to link to other text. Although started before gopher, it was slower to develop.

The development in 1993 of the graphical browser Mosaic by Marc Andreessen and his team at the National Center For Supercomputing Applications (NCSA) gave the protocol its big boost. Later, Andreessen moved to become the brains behind Netscape Corp., which produced the most successful graphical type of browser and server until Microsoft declared war and developed its MicroSoft Internet Explorer.

The early days of the web was a confused period as many developers tried to put their personal stamp on ways the web should develop. The web was threatened with becoming a mass of unrelated protocols that would require different software for different applications. The visionary Michael Dertouzos of MIT's Laboratory for Computer Sciences persuaded Tim Berners-Lee and others to form the World Wide Web Consortium in 1994 to promote and develop standards for the Web. Proprietary plug-ins still abound for the web, but the Consortium has ensured that there are common standards present in every browser.

Since the Internet was initially funded by the government, it was originally limited to research, education, and government uses. Commercial uses were prohibited unless they directly served the goals of research and education. This policy continued until the early 90's, when independent commercial networks began to grow. It then became possible to route traffic across the country from one commercial site to another without passing through the government funded NSFNet Internet backbone.

The Commercial Net

Delphi was the first national commercial online service to offer Internet access to its subscribers. It opened up an email connection in July 1992 and full Internet service in November 1992. All pretenses of limitations on commercial use disappeared in May 1995 when the National Science Foundation ended its sponsorship of the Internet backbone, and all traffic relied on commercial networks. AOL, Prodigy, and CompuServe came online. Since commercial usage was so widespread by this time and educational institutions had been paying their own way for some time, the loss of NSF funding had no appreciable effect on costs.

Today, NSF funding has moved beyond supporting the backbone and higher educational institutions to building the K-12 and local public library accesses on the one hand, and the research on the massive high volume connections on the other.

Microsoft's full scale entry into the browser, server, and Internet Service Provider market completed the major shift over to a commercially based Internet. The release of Windows 98 in June 1998 with the Microsoft browser well integrated into the desktop shows Bill Gates' determination to capitalize on the enormous growth of the Internet. Microsoft's success over the past few years has brought court challenges to their dominance.

A current trend with major implications for the future is the growth of high speed connections. 56K modems and the providers who support them are spreading widely, but this is just a small step compared to what will follow. 56K is not fast enough to carry multimedia, such as sound and video except in low quality. But new technologies many times faster, such as cablemodems, digital subscriber lines (DSL), and satellite broadcast are available in limited locations now, and will become widely available in the next few years. These technologies present problems, not just in the user's connection, but in maintaining high speed data flow reliably from source to the user. Those problems are being worked on, too.

The Future is both Dark and Bright

During this period of enormous growth, businesses entering the Internet arena scrambled to find economic models that work. Free services supported by advertising shifted some of the direct costs away from the consumer--temporarily. Services such as Delphi offered free web pages, chat rooms, and message boards for community building. Online sales have grown rapidly for such products as books and music CDs and computers, but the profit margins are slim when price comparisons are so easy, and public trust in online security is still shaky.

Business models that have worked well are portal sites, that try to provide everything for everybody, and live auctions. AOL's acquisition of Time-Warner was the largest merger in history when it took place and shows the enormous growth of Internet business! The stock market has had a rocky ride, swooping up and down as the new technology companies, the dot.com's encountered good news and bad. The decline in advertising income spelled doom for many dot.coms, and a major shakeout and search for better business models is underway by the survivors.

The crash of the tech sectors on both the major stock exchanges and especially the NASDAQ during the beginning of the new millenium heralded a major shift in the way the internet was developed and used. The days of unlimited spending ceased as the major players began to cut back on expenses and merge to stave off bankruptcy and ruin. In the end, some have remained; Yahoo, MSN, AOL etc while new markets have emerged; E-Bay online purchasing; Kaazaa or Napster Music sharing sites; (since Napster's resurgence as a pay site) travel services such as Expedia where all services can be pre-ordered and planned well in advance. These and many others have become the new commercial directions for the World Wide Web. The development of various search engines to enable the public to surf for information quickly and efficiently have also improved recently. Search services such as Jeeves, Google and

Internet History Study Questions KO 10

1. What was the internet designed in part for?
2. Who used the early internet?
3. How did “@” come into use? What was it used for? Who selected it?
4. What helped mature the internet in the 70’s?
5. What did the National Science Foundation fund in 1986?
6. When /where was the first really friendly interface to the internet developed?
7. When and who formed the World Wide Web? What was it based on?
8. When/who formed the World Wide Web Consortium?What was its purpose?
9. What completed the major shift over to a commercially based Internet?
10. What is the current trend with major implications?
11. What major merger in history shows the enormous growth of Internet business?
12. What 2 new commercial directions have impacted the World Wide Web?