

**ADDIS ABABA INSTITUTE OF TECHNOLOGY**

**CENTER OF INFORMATION TECHNOLOGY AND SCIENTIFIC COMPUTING**

DEPARTMENT OF **SOFTWARE ENGINEERING**

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Submitted by: Lingerew Getie

ID no: ETR/3676/11

Submitted to: Mr. Fitsum Alemu

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The 'Net changed from research to commerce, U.S. to global, safe to scary

The Internet has revolutionized the computer and communications world like nothing before. The invention of the telegraph, telephone, radio, and computer set the stage for this unprecedented integration of capabilities. The Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location. The Internet represents one of the most successful examples of the benefits of sustained investment and commitment to research and development of information infrastructure.

The origins of the Internet date back nearly 40 years, with the U.S. military's funding of a research network dubbed ARPANET in 1969. Since then, the Internet has undergone more than just a name change.

Origins of the Internet

J.C.R. Licklider theory of galatic network

The concept of the Galactic Network was created by J.C.R. Licklider, MIT researcher and professor. Licklider's vision of a Galactic Network—a network of computers that allows users to gather data and access programs anywhere in the world—was detailed in a series of memos. The first, Man-Computer Symbiosis, was written in 1960 and detailed Licklider's thoughts on the development of interaction between humans and computers. The second memo, On-Line Man Computer Communication, was published two years later and took the Galactic Network idea further, promoting the concept of social interaction through the networking of computers. In 1968, Licklider coauthored The Computer as a Communication Device with researcher Robert Taylor. The memo discussed the idea of using online communities and systems as an efficient method of human communication.

Paul Baran Packet Switching History(RAND)

The packet switching concept was first invented by Paul Baran in the early 1960's, and then independently a few years later by Donald Davies. Leonard Kleinrock conducted early research in the related field of digital message switching, and helped build the ARPANET, the world's first packet switching network.

Baran invented the concept of packet switching while a young electrical engineer at RAND when he was asked to perform an investigation into survivable communications networks for the US Air Force, building on one of the first wide area computer networks created for the SAGE radar defence system.

Donald Davies Packet Switching History(NPL)

Davies proposed a national network in the United Kingdom and designed and built the local-area NPL network to demonstrate the technology. Many of the wide-area packet-switched networks built in the 1970s were similar "in nearly all respects" to his original 1965 design. This was independent of the work of Paul Baran in the United States who had a similar idea in the early 1960s.

It happened that the work at MIT (1961-1967), at RAND (1962-1965), and at NPL (1964-1967) had all proceeded in parallel without any of the researchers knowing about the other work.

In August 1968, after Roberts and the DARPA funded community had refined the overall structure and specifications for the ARPANET, an RFQ was released by DARPA for the development of one of the key components, the packet switches called Interface Message Processors (IMP’s).

Due to Kleinrock’s early development of packet switching theory and his focus on analysis, design and measurement, his Network Measurement Center at UCLA was selected to be the first node on the ARPANET. All this came together in September 1969 when BBN installed the first IMP at UCLA and the first host computer was connected. Doug Engelbart’s project on “Augmentation of Human Intellect” (which included NLS, an early hypertext system) at SRI provided a second node.

One month later, when SRI was connected to the ARPANET, the first host-to-host message was sent from Kleinrock’s laboratory to SRI. Two more nodes were added at UC Santa Barbara and University of Utah. These last two nodes incorporated application visualization projects, with Glen Culler and Burton Fried at UCSB investigating methods for display of mathematical functions using storage displays to deal with the problem of refresh over the net, and Robert Taylor and Ivan Sutherland at Utah investigating methods of 3-D representations over the net. Thus, by the end of 1969, four host computers were connected together into the initial ARPANET, and the budding Internet was off the ground.

Computers were added quickly to the ARPANET during the following years, and work proceeded on completing a functionally complete Host-to-Host protocol and other network software. In December 1970 the Network Working Group (NWG) working under S. Crocker finished the initial ARPANET Host-to-Host protocol, called the NCP. As the ARPANET sites completed implementing NCP during the period 1971-1972, the network users finally could begin to develop applications.

