Even though the concept of the Internet as we know it today is very young, the history and evolution of the Internet span over half a century. As there was no master plan guiding the Internet’s development from beginning to present, whenever talking about the History of the Internet, it is better to break it down into the various inventions and ideas that contributed to the process.

The Internet was a child of the competition of the United States and the Soviet Union during the Cold War. However, before discussing the history of the Internet, we need to be informed about how the pre-Internet communication systems functioned. During those times, communication methods were landline telephones, telegrams, and radios. These methods of communication were based and heavily relied on a centralized system, meaning that the sender and recipient directly connected through a pre-defined route. They were also hard to maintain and very expensive because the equipment used to connect the two parties had to be reliable and had to last long.

At the time of the Cold War in the US, there were worries that if the USSR launched nuclear missiles. It would only take one strike at the central station to wipe out all communication in the country, and it would become impossible to strike back without communication between the various parts of their military. In order to make this communication, they needed a system that was nuclear catastrophe proof. At the Research and Development (RAND) Corporation, an American-Polish engineer Paul Baran came up with a solution that would change the existing centralized communication by proposing a new way of distributed networks. In 1962, Baran described in his paper how his proposed way of communication worked. His implementation was worked by placing various nodes across the country and removed the need for a central control station to route the connection; a message would jump from node to node by finding the most accessible route until it reaches the recipient. This method was reliable in case of a nuclear attack because the message will avoid the places which suffered from destruction and go around them and deliver the message. His implementation was also cheaper as the components did not need to be as reliable as the earlier methods of communication. However, when operating, his system required many relay stations that communicated with other nodes and the technology available at the time was not able to handle it.

Then, Baran and a British computer scientist Donald Davies independently concluded that by chopping the message into smaller packets, it would be possible to send the message over a long distance and reconstruct them at the end and deliver the full message. This concept would then lead to the TCP/IP protocol that the Internet uses today. Because RAND did not have the infrastructure to build the nationwide system, they proposed the idea to AT&T; they rejected them because a distributed communication system did not make sense to them as they were accustomed to the centralized system. Even when the idea of a distributed system gained momentum, AT&T was not willing to implement the new system because it would generate more income by using the existing system.

After the USSR launched its first satellite, the united states government established Advanced Research Projects Agency (ARPA) to facilitate research in technology with potential military applications. In 1962, Joseph Licklider joined ARPA as the head of Command and Control research. This position gave him the freedom to pursue various ideas in computing. He believed that humans working with computers could create a better world. Because of that, ARPA would become the birthplace of not only the Internet but also computer graphics, parallel processing, simulations, and others. Licklider created the platform, but Bob Taylor was the first person to propose a significant networking project. Bob had three computer terminals in his office, and all of them were incompatible with each other, so they were not able to communicate with each other. This situation led him to propose the idea to ARPA’s director by explaining how his team could successfully implement a computer network researchers at various ARPA facilities can communicate and use programs of computers located in a different campus. This new network, which is the predecessor of the Internet, would later be known as ARPANET.

ARPANET first linked four universities: Stanford University, UCLA, University of Utah, and UC Santa Barbra. It was used as a messaging service to connect scientists and engineers at different institutions. One of the critical features of ARPANET was that it used packet switching that resembled the ones proposed by Baran and Davies. Messages split into small packets would then be sent over the network. Every computer had the address of every computer on the network, so when one computer sends a packet, it sees the address of the packet and sends it to the next closest computer. The next computer does the same thing until the packet reaches its destination. However, as ARPANET grew and more computers connected to it, some problems arose because every computer had to have the address of every computer on the network to send data to another computer. Then the people at ARPA decided that there should be one computer that kept all the addresses on the network and that every other computer can update their addresses from that computer.

In 1978, ARPANET made a significant leap when it crossed the Atlantic Ocean and connected to other existing networks in Europe. This created an opportunity to standardize how packets were made because every network used different packets. That’s when TCP/IP (Transmission Control Protocol / Internet Protocol) was introduced it made links possible between different computers on different networks. The TCP made sure that every packet is formatted according to a standard format, and IP made sure that every computer had its specific address to avoid naming conflicts. TCP/IP became the standard and ARPANET become the Internet. TCP/IP is the packet protocol still being used on the Internet today.

In the early 1980s, more and more computers were connecting to the Internet because computers were getting cheaper, faster, and spread across the world. This made keeping a central record of all the addresses of every computer very difficult. Scientists needed to come up with a way to solve this problem. So they created the domain name system (DNS). The DNS was a significant invention because it eliminated the need to know the address of the destination. DNS used a hierarchical way of getting addresses from the top down. For example, if we need to connect to “aait.edu.et” first it searches the top-level domain for a computer (DNS server) with the name “et” then from that computer it would navigate to a computer with the name “edu” and so on until it reaches its destination.