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"The Evolution of Computer Science: Major Advancements and Key Contributors from 1969-1971"

Computer science has been a growing field, coming a long way since its beginning. Many different groundbreaking achievements were brought to light when it comes to hardware, software, and networking that bring us to the digital age we live in today. It is amazing how many different advancements were made from 1969 to 1972, many important growths that influenced what we have today.

In the year 1969, many significant things developed because of technological studies. Throughout 1969, computer science was still in the early stages but that didn’t stop major growth and advancements.

One of the most important implementations to the computer science world was the development of ARPANET, which would be the precursor to the internet we have today. ARPANET was created by the Advanced Research Projects Agency (ARPA) of the United States Department of Defense. It served the purpose of allowing researchers at different locations to communicate with each other over long distances. Data sent across The ARPANET was broken into small packets and sent as those small packets. This was because The ARPANET was a packet-switched network so big messages could not be sent in one message. This allowed for efficient use as multiple users could transmit data at the same time! The creation of the ARPANET laid the wires for the development of the Internet. Ultimately this paved the way for the long-distance communication we have today.

Other competitors would start development months down the line of the ARPANET release. One of those is the NPL network that was developed in Britain. ALOHANET was also in the works in Hawaii and would be funded by ARPA, the same people who developed the ARPANET. HLN was also in the works, this would be used for commercial airline communications and not long after, CYCLADES in France was in the works. Even with all these developments, the ARPANET would pull ahead of these rivals due to the amount of funding committed to it.

Aside from the creation of the ARPANET, other things were in development elsewhere in the world such as the Unix Operating System. Unix was created by Ken Thompson and Dennis Ritchie at Bell Labs and had the initial purpose of running on a Digital Equipment Corporation PDP-7 computer. Unix had an intended design to be used as a multi-user operating system. This meant that multiple people could log in and use the system at the same time. Unix ultimately became ideal for use with the ARPANET since it allowed multiple users to have access at the same time. Today, Unix still has its uses and at the time of its creation, it was the dominant operating system from its creation through the 1970s. Not only did operating systems and networks have an influence at the time, but so did the development of one of the first programming languages.

Developing programming languages was also a big aspect of computer science in 1969. The programming language called BASIC was developed by John G. Kemeny and Thomas E. Kurtz at Dartmouth College. BASIC was designed to be nice and simple so that it could be friendly to beginners trying to learn to program. Another programming language that would start to see the development stages would be the C programming language C was developed by Dennis Ritchie and his team at Bell Labs in the late 1960s to early 1970s and was designed to be a low-level programming language that could be used to write software and operating systems. C gained popularity as it was flexible and efficient when it came to using it.

In addition to these achievements, the 1970s would see the creation of the first microprocessor. This would make computers more accessible and affordable, ultimately shaping the way we would interact with technology.

In 1971, Computer science had pivotal growths with the emergence of new studies and technological advancements. Mainstream attention was starting to get a grab on the subject and many computer scientists were experimenting with new technologies and programming languages that would revolutionize the industry. Many of those key advancements are advancements like the Intel 4004 microprocessor, the further development of the Unix Operating System, and the further development of the C programming language.

The Intel 4004 microprocessor was released in 1971, this was the first single-chip processor that was cemented into the legacy of computer science and technology. The processor which contained over 2,000 transistors on a single chip enabled the development of low-cost computing devices that could run calculations and software applications. The Intel 4004 paved the way for further development of microcomputers that would change the way computers are used.

During this year, the first virus known as the “Creeper Virus” had its development. This was engineered by Bob Thomas, an engineer at BBN Technologies. This company was a key player in the creation of the internet we have today. The Creeper virus itself was not a malicious virus like the modern viruses we have today. Rather, it was an experimental program that would replicate itself on infected DEC PDP-10 mainframe computers running the TENEX operating system. The virus would prompt the computer with a pop-up that reads “I’m the creeper, catch me if you can!” before moving on to infect other computers on the same network.

The virus itself was not developed for malicious purposes, but rather to demonstrate the potential for computer programs to spread from one system to another. This concept would grow to become the harmful viruses and malware that we see today.

Aside from the creeper virus and Intel microprocessor, 1971 saw many other growths like that of The Association for Computing Machinery (ACM). The group was the world’s largest scientific and educational computing society at the time. They established their first Special Interest Group on Computer Science Education this year. The group was dedicated to promoting computer science education and advancing the field of computer science through more research and innovation.

The first email also saw development in 1971 by computer engineer Ray Tomlinson. Tomlinson is credited with creating the first email program that would be used to send messages between different computers on the ARPANET. He also introduced the “@” symbol to separate the username and the destination address on the email address. This paved the path for the email systems we used today which have become an essential tool used in the workplace, personal life, and school.

In 1972, Computer science was a rapidly advancing field due to the introduction of new technologies and programming languages. The emergence of the personal computer was still many years out, but the primary focus at this time was the large-scale mainframe systems development.

During this time, one of the first video game consoles called the Magnavox Odyssey, was released. This console was developed by Ralph H. Baer who was a German-born American engineer and inventor. He is often referred to as the “Father of Video Games.” The Magnavox Odyssey allowed its users to play a variety of games like ping-pong, hockey, target shooting, etc. all from their television at home. This does not have direct relevance to the growth of computer science, but it did contribute to the development of interactive entertainment that we have today.

Another significant event was the release of the first edition of “The Art of Computer Programming” by Donald Knuth. This work helped establish computer science as a legit topic of study and is still used today as a reference in many computer science courses.

The University of Utah developed the first computer graphics workstation, called the Utah Teapot. This would become a test object for computer graphics algorithms. To add on, Edwin Catmull developed the Catmull-Clark algorithm that was used for creating smooth surfaces in computer graphics.

The development of the ARPANET continued to grow throughout this year and the first public demonstration would take place in October of 1971. This consisted of linking computers at UCLA, SRI, and UC Santa Barbara together. This early network would lay the foundation for the internet growth we have today.

Also, the release of the C programming language would finally be seen 2 years later by Dennis Ritchie and his team in 1972. C was based on the preexisting BCPL language (Basic Combined Programming language. C would eventually go on to be used to write the source code for the UNIX operating system. Today, C language still sees a lot of uses and we lead to the eventual growth of other languages like C# and C++.

Throughout this time of 1969 to 1972, this was a crucial time for the development of computer science. Significant advancements in hardware, software, and networking would pave the way for many technologies we have today. The ARPANET, Unix operating system, C language, and Intel 4004 microprocessor were just a scratch at the big innovations that emerged during this period. Many key individuals would be recognized and be cemented in the history of Computer Science.

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