

Scientific and technological advancements in the 1970s and their impact on americ...

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Many significant electronic and computer inventions that continue to play a vital role in society today date back to the 1970s. The American public was greatly impacted in various ways due to the affordability, efficiency, and novelty of these inventions. In Space exploration, the continuation of the Space Race implemented the improved relationship between the US and the USSR. Detente also led to an official of the Space Race. As a result, American culture was greatly influenced by the significant scientific and technological advancements in the 1970s particularly in computer and electronics technology. In the Space Race, the 1970s was a period of reduced tensions due to the improved relation between the US and the Soviet Union.

In addition, the accomplishment of the first lunar landing in 1969 had set a clear victory for the US. However, the Space Race continued in the 1970s as its significance started to subside due to the confrontation of many difficult circumstances such as the Vietnam War and the energy crisis. One of the elements of space exploration that the US government was interested in was the development of re-usable space shuttles for scientific research and experimentations. Even though such a shuttle was not fully developed until 1978, the Skylab created by NASA since 1973, served as a space station for scientists to study celestial bodies and perform experiments. In brief, a reusable space shuttle was an ultimate US goal for Space Race in the 1970s due to this period of detente.

(Chaikin) As the decade progressed, the Apollo missions continued lunar explorations. However, unlike the Apollo missions in most of the 1960s, the missions placed a more heavy emphasis on scientific exploration. The Apollo 12 mission started off this target by launching a 363-foot rocket on <https://assignbuster.com/scientific-and-technological-advancements-in-the-1970s-and-their-impact-on-american-culture/>

November 14, 1969 with the intention of performing scientific experiments, obtain photographs, and develop procedures for landing capacities. The mission was a success under the command of astronaut Charles Conrad. However, Apollo 13 was not as fortunate as Apollo 12. Scientists' hopes were high for the Apollo 13 due to the success of previous missions.

However, they were disappointed 55 hours and 54 minutes into the mission when it had to cancel due to an explosion of an oxygen tank in April, 1970. After that, four more missions follow in an effort of lunar exploration. On December, 1972, NASA's effort in lunar exploration ended with the last Apollo mission, Apollo 17. For the first time in space exploration, professional geologist, Harrison Schmitt, visited the moon surface and studied its features. On December 16, 1972, the splashdown of Apollo 17 officially marked an end to man's active lunar exploration in the 20th century.

As a result of the Apollo missions, many questions about lunar science were answered and other mysteries are provided with collected data. (" Apollo 12"; " Apollo 13"; " Apollo 17"; Chaikin) After a long and exhaustive period of space competition, the US and the USSR finally agreed to officially conclude the Space Race diplomatically by introducing the Apollo-Soyuz Test Project (ASTP). In early 1971, the Soviet Union responded optimistically to a US proposal of a joint space mission. In 1972, the " Agreement Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes" was signed that yielded to the ASTP. Since then, the US and the USSR cooperated to create two compatible spacecrafts that dock together in space.

The task was established on July 15, 1975 at 2: 17 p. m. (CDT) when the spacecrafts were joined and American astronaut Thomas Stafford and Soviet cosmonaut Alexei Leonov shook hands. During the joint mission, the astronauts only spoke the other's nation language. The joint operations remained for two days.

This important event had set an end to the Space Race that lasted nearly two decades. ASPT was a symbolic demonstration of the improved relation between the US and the USSR. Even though this symbolic event did not obtain direct impact on American lives, it still held great significance on scientific exploration. (Chaikin; " Suckow") Due to the improved relation between the US and the USSR, the Space Race was not as intense as previous decades. Nevertheless, it still possessed indirect influence over the American public. For more than a decade, Americans had to suffer the fear of losing the Space Race since Sputnik.

Even though the lunar landing set a clear victory for the US, the Space Race did not end. Therefore, the ASTP brought an official end to one aspect of Americans' apprehension of defeat in the Cold War. More importantly, the continuation of the Space Race brought forth great scientific and technological breakthrough that continued to influence the scientific community today. For instance, the development of the moon rovers allows scientists to study the lunar geographic features from Earth. Technology in space exploration set a foundation for future development.

In addition, a number of scientific experiments were conducted during the space missions that yielded to many unsolved questions. For example,

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during the ASTP, Electrophoresis experiment was performed that helped scientist to observe cell biological processes in a low gravitational environment. In conclusion, the continuation of the Space Race brought great benefits to the scientific community. The 1970s marked an official end to the American public's concern towards the Space Race. (" Apollo-Soyuz"; Chaikin) As the excitement in the Space Race started to subside, exhilaration from electronics and computers technology erupted. In the 1970s, one exceptionally important invention that led to other significant innovations in computer technology was the development of the microprocessor.

The microprocessor was first invented by an Intel scientist, Ted Hoff, while working with BUSICOM, a Japanese manufacturer of electronic calculator, to improve the calculator model. Instead of the old chip design that could only function minimally, Hoff had a vision for a better invention. He wanted to create a small integrated-circuit chip containing of thousands of transistors that could memorize information through the principles of electronics. Therefore, working with BUSICOM gave him the opportunity to expand his vision to develop what became known as a microprocessor. The first microprocessor was under the ownership of BUSICOM.

Hence, Intel had to purchase it back for \$60, 000. In 1971, Intel introduced its very first microprocessor, the Intel 4004. Even though the processor was about 1/8 inch by 1/12 inch, it contained as much information as a 30-ton UNIVAC. Therefore, this dominant invention played an essential role the developments of future technology that greatly impacted American society. (" Invention"; " Microprocessor" Intel; " Microprocessor - Fascinating") As

complicated as a microprocessor can be, it can be briefly explained by introducing a few electronics principles. First, one must understand the fundamentals of electric currents that include voltage, ampere, and resistance.

Once a complete electric circuit is set, electrons are to flow in a directional path within the given medium. The driving force that the electrons possess to travel at a specific velocity is determined by the amount of voltage known as electromotive force. The amount of electrons that travel through a given region at a given time is the current density measured in amperes. Along the course of the circuit, the presence of resistance allows scientists to control the current density in a conductor. After these basic concepts are understood, the fundamentals of the microprocessor can be explored more in-depth. (Brian; Mims) A microprocessor is a small silicon chip that contains thousands of transistors to function and generate information to perform specific tasks.

Transistors are semiconducting materials that contain three separate leads. One in three leads possesses a small amount of voltage or ampere that allows it to suppress or endure the efficiency of the other two. By doing so, transistors act as amplification that govern the activity within themselves. Hence, the electric waves that are transmitted from the transistors can process instructions to perform functions. These waves are interchanged in the chip through the process information known as an integrated circuit.

These integrated circuits are the essential factor of interchange complex instruction to maintain the function of the chip. In brief, the process of the <https://assignbuster.com/scientific-and-technological-advancements-in-the-1970s-and-their-impact-on-american-culture/>

microprocessor is governed by the activity of the transistors that obtains significant application for many other inventions. (Brain; Mims) The microprocessor possessed tremendous applications that affect society worldwide since the 1970s. Due to the small size of the microprocessor, computational devices can be created with reasonable dimensions at an affordable cost. In addition, because of the capability of storing information, the microprocessor also clear the way for the invention of the computers.

It gave inventors important opportunities to innovate earlier models of the computer with an increase in function. As a result, the noteworthy invention of the microprocessor gave promise to many other groundbreaking creations that obtained a heavy influence on American culture. (Tyson) As a direct decedent of the microprocessor, a new and innovated computer that can afforded by typical Americans were developed thanks largely to Steven Jobs and Stephen Wozniak. The origin of computer technology was traced back to 1936 when the Z1 Computer was invented. Then new models were introduced including the ENIAC, UNIVAC, MIRC, and ERMA. However, these early computers were still not applicable to American public due to their high cost and inefficiency.

For instance, many computers used to fill an entire building or at least a room. Therefore, they were aimed to be used by businesses, government, and professional scientists. As a result, the problems with these early models of computer set stage for Jobs and Wozniak (Woz) to introduce their revolutionary model. (Greenberg; Bellis) Jobs and Woz were credited for their important invention of theApplecomputers. While working at the Hewlett-

Packard Company in the early 1970s, Woz was given the opportunity to utilize company's equipments for personal invention.

Therefore, he was able to construct his own computer. In 1976, Woz invented a small computer model that has a television screen connected to a keyboard known as the Apple I. When Jobs saw the computer, he suggested marketing it. On April 1st, 1976, the Apple Company was formed introducing the Apple I model. Their businesses started very limitedly due to lack of funds. Despite the obstacles, the two partners decided to remain in business.

Their business truly took off when Byte Store ordered 500 Apple I computers. As improved as the Apple I was, it was only designed for professional computer users. The mechanics and programming of the Apple I were extremely complicated that limited ordinary Americans' uses. Therefore, Jobs and Woz decided to create a general-purpose Apple II computer that anyone could use. The Apple II computer had color graphics and was introduced in 1977. It cost about \$1, 600, which was still expensive to many Americans.

However, it attracted many businesses because of its convenience and usability. A. C. Markkula, a salesman for Intel, invested \$250, 000 to Apple Company. By late 1980, the company was worth \$178 billion. As a result, the significant technological breakthrough of the Apple computers continued to impact society worldwide.

(Apple; Bellis; Greenberg) The mechanical and scientific concepts behind the Apple computers are impossible to fully describe in general terms. However, most computers use the principles of electronics to process their information

around a microprocessor. A computer contains many special electronics components that are responsible for specific functions. Most computers contain a hard disk, a modem, and a memory. It also possesses its special language to process the functions through different components. The Central Processing Unit, also known as the CPU, is the microprocessor of the computer that oversees every function in the computer.

Memory components are very essential to the development of computers to store necessary information from the microprocessor. A hard disk works to maintain permanent or long-term memory such as a program or software. Many different components function together in a computer to generate information presented on the television screen. A key board is also set up to fulfill the responses of the person using the computer. In brief, the computer uses an in-depth amount of scientific concepts to process and generate information in an electronics environment. (Tyson) The Apple II computer was the perhaps one of the most significant invention of the 1970s.

Even though it did not immediately impact American society, it granted tremendous influence worldwide until the present day. For one of the first times, ordinary Americans could actually afford a computer. Businesses could process their information much quicker and easier. Similar to the invention of TVs, computers eventually became a household object that allows people to perform many tasks easily and efficiently. Over the decades, computers provided a tremendous impact on daily life including business work, entertainment, education, research, and other uses. Children can now play video games on computer as a source of entertainment.

Adults can pay bill, write letters, research, send e-mails, and complete other work without wasting too much time. In addition, as the demands on the Apple computer rise, many other industries were benefitted. Computer Software, Education Programs, Word Processor, Internet, and Printers Companies had the opportunity to introduce new and improved products that can use as a supplement with the Apple Computers. Therefore, the invention of the Apple computers in the 1970s brought forth tremendous benefits to American society in particular and to the world in general. (“Apple”; Greenberg) Even though innovations in computer technology were tremendous, biological improvements should not be overlooked due to their important impact in the field of medicine.

In 1971, the first synthetic production of human growth hormones was made. These synthetic growth hormones would be used to treat cancer and AIDS patients to recover their weight loss. Since growth hormones are essential to everyone, the synthesis of them was extremely important in the path of treating fatal diseases using these synthetic hormones. Another important discovery in biological science in the 1970s was the development of genetically engineered insulin. By using the techniques in genetics engineering, scientists were able to manipulate the genetic information by inserting DNA into bacteria which resulted in the production of insulin synthesis.

Insulin synthesis was a significant vector of medical science because it helped to treat diabetic patients more efficiently. These significant improvements in biological science resulted in many benefits in society due

to the introduction of new medical protocols and treatments. (“ Chemsoc”)
As the 1970s progressed, many new and improved technological and scientific inventions were introduced that obtained significant impacts on American public. The introduction of the microprocessor revolutionized the field of electronics due to the significant impact on computer innovation. The 1970s also marked an official end to the competitive Space Race.

Lastly, the improvements in biological science introduced new treatments and a more profound knowledge that brought forth great benefits for future studies. In conclusion, many important scientific and technological advancements in the 1970s greatly continued to influence the American public in various aspects. Bibliography “ Apple Inc.,” Microsoft Encarta Online Encyclopedia. 2009.

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