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The Impact of Science and Technology on the Growth of Civilization

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Abstract

Science and Technology plays a significant role in the development of civilization. Civilization is an advanced level of human social development and structure which is a complex society. Technology has had a positive impact on human life from ancient times to the present by resolving obstacles in daily life and making many jobs easier to do.

Keywords: Civilization, Science and Technology, Society

Introduction

In the present situational atmosphere people or human-beings are living comfortably and amicably in the modern societies, social groups or civilized world. In this context, the words of the renowned Greek Philosopher Aristotle should be remembered, "Man is a social animal. He who lives without society is either a beast or God". So, man's sociability is the primary purpose for his existence in society. All of man's social characteristics are learned through society. "Man is not born human, but to be made human," Prof. Park says. Consequently, there are numerous firm bonds between man and society. In the process of civilization or civilized society, man has gradually discovered, invented and used numerous tools and supporting things for his existence and comfortable life; and in the course of living man learns to find or invent technological devices in order to fulfill his physical and psychological needs and necessities. Consequently in the later years it leads to revolutions- from industrial to digital. All this is based on the concept- *"Necessity is the mother of invention"*.

Society and Civilization

There appears to be considerable agreement on the meanings of the words "society" and "civilization." As per Oxford definition, society means "The aggregate of people living together in a more or less ordered community". Merriam-Webster dictionary defines, "People in general thought of as living together in organized communities with shared laws, traditions, and values". Therefore, society is a group of people who live together under a common set of customs, rules, or procedures.

Civilization, conversely, is an advanced level of human social development and structure. The term "civilization" has a number of different connotations in relation to human society; and a civilization is a complex society.

To different people, the term civilization may have varied meanings and connotations. It is a stage of human social evolution and structure that can be broadly defined. Some dictionaries have definitions for this word, such as:

"The stage of human social development and organization which is considered most advanced" (Oxford dictionary).

"The condition that exists when people have developed effective ways of organizing a society and care about art, science, etc.",(Merriam-Webster dictionary).

Based on these definitions, civilization is defined as a disciplined and evolved society. It is moreover worth noting that civilization encompasses both society and culture. Generally civilization indicates the ease and convenience of contemporary life that is seen to be limited to towns and cities. Westerners have used this term to characterize their style of life in the past, as opposed to the other manner of life they experienced in the east.

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The Origin of Civilization

Except for the last 10,000 years or so, humans have lived almost solely in small nomadic groups, relying on their abilities to find food, hunt and fish, and avoid predators to survive. Most of these groups, it is plausible to assume, arose in tropical latitudes, particularly in Africa, where climatic circumstances are most suitable for a species with such weak body protection as living beings.

In the course of existence, agriculture made it beneficial for people in certain areas to live in large groups, primarily in river valleys where irrigation techniques could be used. In Mesopotamia, for instance, productivity soared to the point that a massive population accumulation emerged; and so, it marked the start of the form of social order that it now refers to as civilization.

Consequently, a technological breakthrough—namely, the invention of agriculture—made civilization feasible. The increased proportion of people who could be sustained by agriculture prompted to many discoveries, the most significant of which was the development of ways for processing metals, particularly copper and its alloys. Furthermore, as people began to live together in greater numbers, it became increasingly vital to have techniques of recording information, such as where a man's land began and ended, how many livestock he had, and other such details. So, the beginnings of the intellectual creations of writing and numbers, as well as the beginnings of computation emerged.

Science and Technology

On the whole, science is basically defined as, "systematic knowledge of nature through repeatable observation and experimentation". Its goal and purpose is to figure out what laws control natural occurrences. Science, as defined in this sense, has existed as a human activity even before the emergence of the earliest civilizations.

In early human societies individuals had to devote a large portion of their time in obtaining food and shelter; and so they could not afford to spend time on non-essential pursuits. If science was practised in the early societies, it had to be for a reason; in other words, it had to be pursued for practical purposes. The findings of science resulted in new technical advancements.

When it comes to the definition of the word "technology," it has undergone various changes since it was first used in Europe in the 17th century. In the broadest sense, it might be characterized as the application of knowledge in relation to environment to practical goals of human effort. Humans in the Stone Age discovered that flint stone makes superior cutting tools than sandstone. They made that finding and put their knowledge to use long before anyone came up with a scientific description for the event.

It is amazing to think that extended eras of human history were marked by the mastery of technologies like copper, bronze, and iron smelting without much understanding of the fundamental scientific concepts.

Consequently, the relationship is flipped; and most of the new technology is the outcome of prior scientific research. It is also widely acknowledged that science and technology are now inextricably connected, with science providing the theoretical foundation for technical applications.

Technology and science must be viewed as closely connected in the setting of this course, as both need methodical thinking and research. They began as parallel developments that were more or less independent of one another at first, but as the ages passed, they grew closer and eventually became intertwined.

Technology in the Stone Age

Even the Stone Age inhabitants considered technology to be very significant. There were significant changes and amazing inventions throughout the Stone Age. Long ago, around two lakh years, humans

had very little. They didn't learn how to dress themselves; and they knew nothing about shelter either. Their tools were, for dealing with issues that might occur in hunting, for instance, nothing more than random fragments of stone that they had picked up off the ground.

Subsequently, over millennia, individuals found that by manipulating stones rather than picking them up in their natural state; they could manufacture superior tools. It's odd that two different techniques of shaping have been identified. In the way that they took stones and chipped away at them until they had the desired shape. The alternative method was to chip larger stones and use the chippings to produce tools. In another case, the core was sought, whereas in the other, it was the pieces that had been chipped off that were sought.

Science, Technology and Society

The explication of unknown occurrences and the development of new information through the discovery of new natural laws and principles are referred to as scientific and technical activities; and the new knowledge acquired is subsequently applied in real life. The spirit of how science and technology contribute to the development of the society is the discovery of new knowledge and then the use of that knowledge to improve human well-being and address societal concerns.

With the transition to a knowledge-based general public well ongoing in the early years of the twenty-first century; the acquisition of new knowledge is becoming progressively more important part of scientific and technological activities; and the responsibility of science in this knowledge conception is critical for achieving "science and technology for society."

Science arose from natural philosophy and was fostered by people's natural curiosity, but technology has progressed in close association to the convenience and prosperity of human life since before the beginning of recorded history. Science has evolved as a distinct entity from technology, with the fundamental goal of elucidating how nature is set together and operated.

In fact, it was more common for new technologies to be developed in order to pursue scientific research. Following the Industrial Revolution, science and technology started moving closely together on their distinct paths. Notably, after approximately 1850, when a chemical industry formed from the application of chemistry knowledge and electrical technologies emerged from the application of electromagnetic knowledge, the idea of tying scientific achievements to technology for use in society became popular. Nonetheless, science has shifted away from being a purely intellectual pursuit, with scientific findings increasingly exploring the limits of human activity in terms of space and time, as well as enhancing human capacity. From the standpoint of civilization, science has also been a huge effect on people's set of ethics, varying the nature of society and becoming the engine propelling society's evolution.

The impact of Scientific Progress and the Nature of Society

While there are undoubtedly other examples of scientific development having a significant impact on people's sense of values and affecting the nature of society, the following is a brief overview of a few of the most well-known. Albert Einstein, one of the greatest scientists of the twentieth century, published a theory of the photon, a theory of Brownian motion, and the Special Theory of Relativity in the "Miracle Year" of 1905, all of which served to shatter the then-prevailing beliefs of physics. Einstein's Theory of Relativity laid the groundwork for all subsequent physics, paving the way for significant advancement in a variety of domains. Simultaneously, it shifted people's perceptions of space and time, as well as having a significant impact on philosophy and thought.

Nicolaus Copernicus created a theory in astronomy, which was later bolstered and modified by Johannes Kepler and Galileo Galilei, and had a significant impact on the evolution and reform of society, shattering Europe's mediaeval sense of values and propelling it into the modern period. However, in recent years, examples of such societal-changing advancements have become more prominent. For instance, Edwin Hubble's discovery in 1929 that the cosmos was expanding led to

George Gamow and colleagues' Big Bang theory of the universe's beginning in 1946. Arno Penzias and Robert Wilson discovered cosmic background radiation, which provided strong evidence for the Big Bang theory, in 1965. People gained a new "feeling of the universe" as a result of these discoveries. Furthermore, breakthroughs in space research have substantially enlarged the space available for future human activity, allowing humanity to dream of new horizons.

Moreover, Sherwood Rowland and Mario Molina's discovery in 1974 that chlorofluorocarbon emissions were causing ozone depletion, followed by the finding of an ozone hole in 1985, had a tremendous impact on attempts to protect the worldwide environment.

However, developments in the life sciences, such as Charles Robert Darwin's Theory of Evolution, which dramatically altered people's "sense of nature," "sense of humanity," and "feeling of society" in the 19th century, show that findings can impact people's thinking in a variety of ways.

The discovery in 1953 of the double helix structure of the DNA molecule by James Watson and Francis Crick gave birth to an entirely new field of molecular biology. The result has been progressive elucidation of the structure of living things at the molecular level and rapid advances in the life sciences, including the establishment of gene recombinant technology by Stanley Cohen and Herbert Boyer in 1973, the birth of a cloned sheep, Dolly, in 1996, and completion in 2003 of the project to sequence the entire human genome, conducted by the International Human Genome Sequencing Consortium, a collaboration of six countries including Japan, and five other North American and European countries.

James Watson and Francis Crick's discovery of the double helix structure of the DNA molecule in 1953 ushered in a whole new discipline of molecular biology. The result has been a gradual elucidation of the structure of living things at the molecular basis, as well as significant advancements in the life sciences, such as Stanley Cohen and Herbert Boyer's invention of gene recombinant technology in 1973, the birth of a cloned sheep named Dolly in 1996, and the accomplishment in 2003 of the International Human Genome Sequencing Consortium's project to succession the whole human genome, led by six nations together with Japan and five other nations from North America and Europe. The modern advancements in the life sciences have substantially enhanced understanding of humans and other living things, broadening the limits of human activity, especially in the healthcare profession, and having a significant impact on individuals' "sense of life" and "sense of ethics."

Furthermore, developments in brain research suggest that we may be getting closer to understanding the human soul, and success in this field will undoubtedly have a significant impact on people's set of ethics. In the modern days, the IT revolution is the result of numerous improvements in computer technology, including Alan Turing's concept of the computing machine and William Shockley, John Bardeen, and Walter Brattain's scientific discovery of the transistor, and the Internet and many other breakthroughs in information and communications technology. The IT revolution, on the other hand, is transforming people's behaviour and lifestyles by allowing individuals all over the world to access cyberspace for rapid information and opinion exchange. The IT revolution has altered the nature of society in many ways, including education, medical and welfare, transportation, banking, and manufacturing, as well as work and leisure patterns.

In addition, breakthroughs in nanotechnology have enabled the understanding and modulation of phenomena at the atomic or molecular level; achievements previously thought unachievable are currently broadening the scope of human operations. Television, as the most powerful communication mechanism, has been a crucial force in creating our modern culture in other ways. Commencing with Guglielmo Marconi's invention of wireless transmission in 1895, the discovery of the Braun tube in 1897, the discovery of the Yagi-Uda antenna in 1925, and Kenjiro Takayanagi's successful transmission of an electronic image using a Braun tube in 1926, this gadget is the culmination of various scientific outcomes over the years.

The Impact of Technology on Human Life

Finally, technology has had a positive impact on human life from ancient times to the present by resolving obstacles in daily life and making many jobs easier to do. Technology has made it possible to cultivate, build cities, and travel, among other things, successfully connecting all countries on the planet, assisting in the creation of globalization, and making it easier for economies to flourish and businesses to do business. Using technology solutions, virtually every aspect of human life may be made easier, more effective, and faster, resulting in fewer issues in one direction and even more difficulties in the other.

Although technology has had some unfavorable effects on society as a whole, there are likely to be more beneficial effects than bad effects. Many people's lives have been made easier as a result of such influences, and many have been given the resources, information, and tools they need to lead a decent life. These effects have had a significant impact on agriculture, transportation, communication, and education in societies around the world.

Modernization of Agriculture

With the modernization of agriculture, ancient agricultural techniques have undergone significant changes. Mechanization literally implies that ancient farming practices including work with animals and physical labor have been supplanted by machinery and technology systems together with robots. Consequently, more mechanized, high-efficiency farm operations have emerged, resulting in significantly more abundant food resources for a greater number of people.

Transportation Facilities

While most places on Earth may still be reached on foot, the introduction of trains, buses, cars, aeroplanes, motorboats, and other modes of transportation have made it easier for individuals to travel to and from their desired location in much less time. Carpooling applications like Uber and Grab, that have made it exceedingly easy to go to a destination easily and cheaply, have been added to the mix. Considering infrastructure, which comprises both telecommunication and transportation systems, is the underpinning of any community, the evolution of these systems has played a significant role in shaping the modern society.

Advancement of Communications

Telecommunications systems are an essential component of any contemporary civilization. Individuals can stay linked in a globalised society by using bird communications and smoke signals to the quicker, more effective, more practical, and more global system of email, phone calls, and app messaging. People may travel the world and stay interconnected owing to Skype, VOIP, and global telecom providers. It's even easier for remote workers or multinational firms to use video conferences and conference meetings over the Internet to continue their organizations running smoothly.

Educational and Learning Resources

In today's world, learning nearly any ability, whether it's a new language, a programming language, a technological expertise, or an ancient element of history, is as simple as conducting a Google search, listening to a podcast, or watching a YouTube video. Rather of learning from printed books, individuals can now study quicker, more efficiently, and with the comfort of mobile computer networks, thanks to eBooks and even online conferences. Online portals and online platforms have also enabled academic institutions to provide educational resources in an innovative, streamlined way, enabling learners to practice materials utilizing computer networks that they are already intimately acquainted with while also consolidating their educational materials in a single location.

Conclusion

The present paper describes how Science and Technology helped and played its role in the development of civilization. Since the beginning of civilization, technology has had a massive, almost inconceivable effect on life. Although it is nearly hard to assess the whole extent of technology's impact on human society, it is undeniable that it has made life better, more delightful, and more comfortable.

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