ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 8.4
IJAR 2022; 8(7): 155-160
www.allresearchjournal.com
Received: 11-04-2022
Accepted: 05-06-2022

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Chronology of technology

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Abstract
Humans have a long history with technology and machines. Since ancient times, we have used tools and devices to help ourselves, and our techniques have expanded and developed over time. As a result of this expansion, today, our technology is very advanced, and it appears that it can meet all of our needs.
All of this has started from scratch, and in this article, I've traced the evolution of technology over centuries.

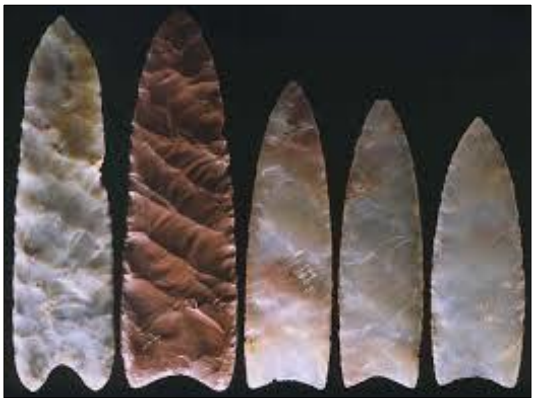
Keywords: Technology in pre-historic times, technology in ancient times, technology in medieval times, technology in modern era, technology in contemporary world, digital revolution, fourth industrial revolution

Introduction
Technology has played a very important role throughout modern human history and has made our lives easier. Though using technology for assistance has been a very old human practice, recently, after the Industrial revolution in mechanizing (which began during the 17th century), a new class of complex technology and machinery has arrived, which has changed our lifestyle. Some Literary fictions reflect this strange new world, speculating on the future, with marvels such as steam-powered mechanical men. With such growing sophistication in technology, no one can foresee where this world will go in the future. What else could machines do if they could work? Where might machines take us in today's rapidly mechanizing world? But out of all this, one thing is sure: We live in an era where technological advances will be common.

History of Technology
We, humans, have a very old relationship with technology. It appears that technology has travelled all over the world throughout centuries, beginning in the east (Indian subcontinent, Egyptian Empire, The Persian Empire, Ancient China etc.), then moving west (Ancient Greece, Persian Empire, Roman Empire), and then to the Middle East (The Golden Islamic Age). It then travelled to Europe, and finally, it appears to be relocating across the world. However, no matter which path it took, it all began in pre-historic times.

Pre-Historic Period (2.5 million years ago to 1200 B.C.)
Stone Age
The first traces of technology in human history were found in the stone age. Before that, Animals occasionally used natural tools such as sticks or stones, but this was the first giant step for any creature towards fashioning their own tools. Even then, it was not done regularly for a long time, until many aeons passed and they reached the phase of standardizing manufacturing and providing sites and specialists to work. Finally, by 70,000 BCE, a degree of specialization in toolmaking was achieved. By 35,000 BCE, more-advanced tools, requiring assemblage of head and haft, were produced, while later Neolithic (New Stone Age; 6000 BCE) and Metal Age peoples applied mechanical concepts (about 3000 BCE).
Though it may be assumed that primitive humans used other materials such as wood, bone, fur, leaves, and grasses before they mastered using stone, apart from bone antlers, but none of these has survived. The stone tools of early humans, on the other hand, have survived in surprising abundance. Over the many millennia of prehistory, essential technological advances were made using stone.

Many things such as Knives, fire, clothes, weaving skills, and ceramic objects such as jars and jugs were all invented in the stone age.



Knife

clothes

pottery

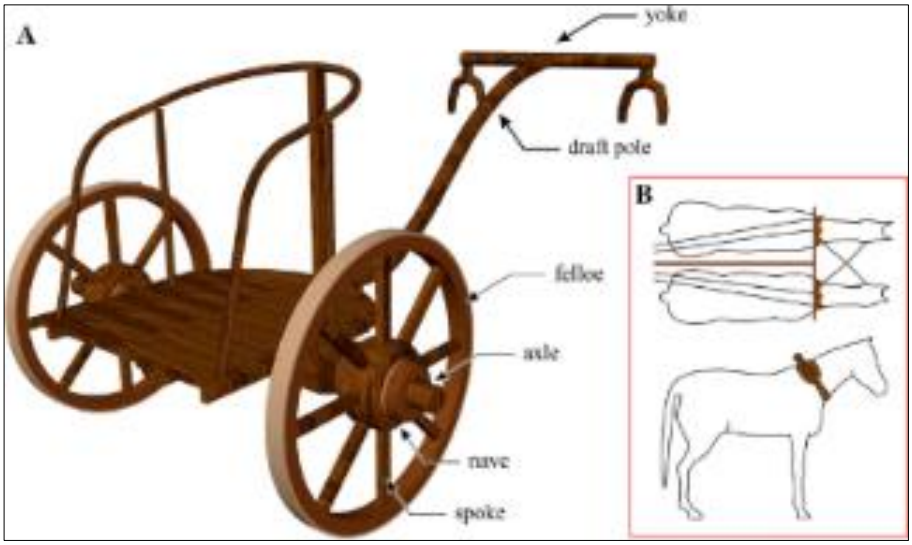
Bronze Age

As aeons further passed, they led to the onset of the Bronze age. The Bronze Age marked the first- time humans started to work with metal, and early stone tools and weaponry were quickly phased out in favour of bronze. The discovery of bronze was a major breakthrough allowing civilizations to develop faster. As bronze was harder and more durable than other metals available then, it helped them gain a major technological advantage.

Humans generated many remarkable tools and innovations throughout this period, which not only aided the improvement of everyday life, but also laid the foundation for future nations and civilizations to succeed. Some of them are Bronze metal, Wheel, Soap, Rope, Umbrella, Locks, Chariots, etc.

Wheel

lock



Chariot

Iron Age

In the Stone–Bronze–Iron Age cycle, the Iron Age is the final technical and cultural period. This period is noted for its iron production. Even though making iron required more technological sophistication and labour intensity than making bronze, the iron age firmly overtook the bronze age because iron exists more frequently in nature than bronze. Although the use of iron was slow to spread, it was a significant shift in human technology that took us to where we are now. The production of iron brought plenty of new tools that had never been seen before, like Stronger armour and weapons, modern ploughshares, axles, vessels, ships, etc.

The Iron Age also introduced two very important artisanal tools- the wood pole lathe and the potter's wheel. Before the invention of the wheel, people used to make pottery by rolling and coiling clay, but the wheel made the process faster and more efficient.

Sword

plough potter's wheel

Ancient Period (3000 Bce To 500 Ce)

Technology in the Ancient Egyptian Empire

The Ancient Egyptians were one of the first civilizations to form in the ancient world. Their inventions and technologies influenced many succeeding civilizations. Their technology included the ability to construct massive structures like pyramids and palaces, simple devices like ramps and levers and a complex government and religious system.

Aside from historic monuments and grand temples, the ancient Egyptians invented many items that we now use today. They invented paper and ink, cosmetics, toothbrush and toothpaste, and even the precursor of the contemporary breath mint. They also made breakthroughs in practically every field of knowledge, from simple household items to beer brewing, engineering and building, agriculture and architecture, medicine, astronomy, art, and literature.

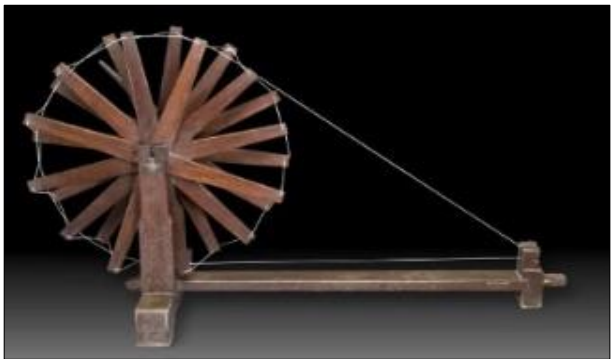
Artefacts

Toothpaste

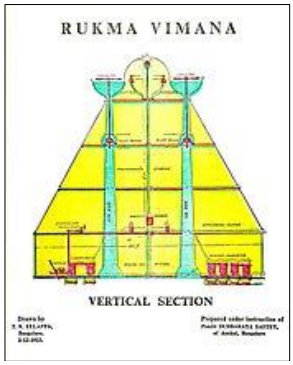
Pyramid

Technology in the Indian Subcontinent

One of the oldest civilizations in the world, the Indian civilization has a strong tradition of science and technology. The Indus valley civilization and the Harrapan civilizations are occasionally considered the most advanced civilizations of all time. Some of the earliest machines date from ancient India, and many references can be found in ancient Indian literature. Many theories and techniques discovered by the ancient Indians have created and strengthened the fundamentals of modern science and technology. While some of these ground-breaking contributions have been acknowledged, some are still unknown to most. For example, The Spinning wheel, a mechanized method of spinning yarn, was invented in India around 500 B.C and eventually replaced hand spinning across the world.

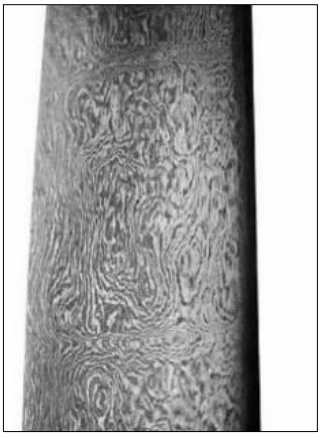


Charkha



Vimana

Smelting of Zinc



Steel

Other technologies like Flying machines, medical equipment, solar clocks, astrological devices, irrigation mechanisms, decimal systems, algorithms, Wootz Steel, Smelting of Zinc, Iron cased Rockets, Plastic Surgery, Cataract Surgery, etc were also invented there.

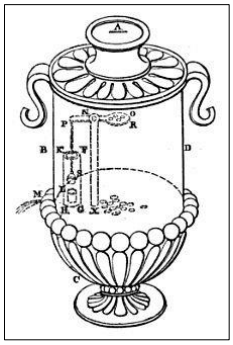
Technology in the Ancient Western Civilization

As time elapsed and technology moved towards the west, advancements were seen in the Western belt. When the ancient Greek and Roman empires grew in power, they introduced new advancements that brought a new era. Interestingly, many of the technologies we use today are based on their inventions. For instance, in ancient Greece in 2 B.C., The Antikythera mechanism, an Ancient Greek hand-powered orrery, was found. It is considered the oldest example of an analogue computer, which is used to predict astronomical positions and eclipses decades in advance.

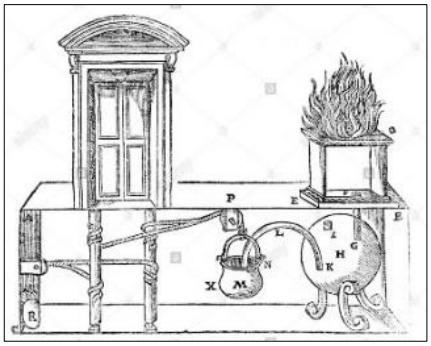
Other notable inventions of the time are Crane, Automated Doors, Cement, Alarm Clock, Refrigerators, Central Heating, Vending machines, Umbrellas, Sinks with running water, etc.

Antikythera mechanism

Crane



Vending machine



Automated doors

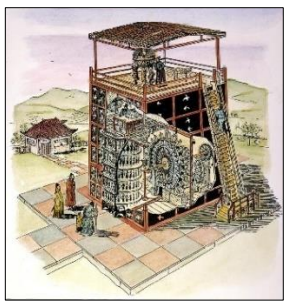
MIDDLE AGES (500 CE to 1500 CE)

Technology in China

From the first century B.C to the 15th century, China held the world's top position in several domains of science, including the natural sciences, engineering, medicine, military technology, mathematics, geology and astronomy. Among the earliest inventions were the sundial, abacus and the lantern. Later came the Four Great Inventions- the compass, paper making, gun powder and printing- which are the most significant contributions of the Chinese society to world civilization. Aside from the four main inventions, Ancient China also made numerous other inventions, like the mechanical clock, tea, Silk, Acupuncture, earthquake detector, seed drill, paper money, etc.

Compass

paper



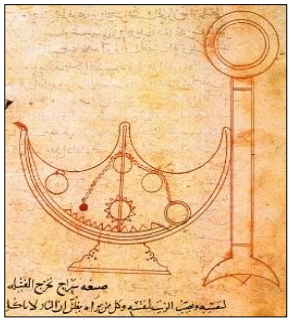
mechanical clock

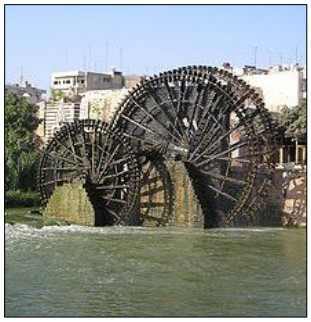
Technology in the Middle East

Technological industry flourished in the Middle East throughout the Golden Islamic period. The House of Wisdom in Baghdad was one of the world's most remarkable institutions, with some of the world's greatest inventors conducting studies there. The Banu Musa brothers, for instance, researched there and wrote a book called the Book of Tricks about their discoveries, which contains many incredible scientific tricks. It is one of the world's most fascinating science books, and the workings of many of its innovations are still a mystery.

Many items that we use today were developed in that era, like cameras, voice recorders, batteries, water motors, city water harvesting systems, Sulphuric Acid, Wind Mills, Magnifying Glass, Toothbrush, etc. Along with these, this era also gave some of the most fascinating theories and postulates like the Algebra and the Optics.

The book of Tricks





Water Wheel

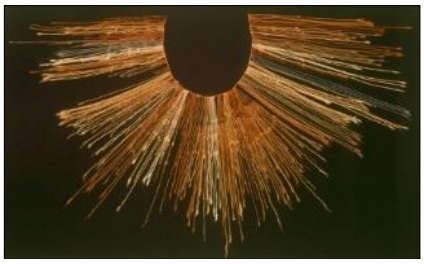
The Incan Empire

The Incas had a number of ingenious inventions that enabled them to spread their empire across almost all of South America. The Incas' intellect was unquestionably outstanding and advanced despite being cut off from the period's great Asian and European civilizations. The Incas were skilled at stone cutting, agriculture, astronomy, mathematics, medicine, hydraulics, architecture, record-keeping, and military strategy. Additionally, they possessed a significant 16,000-mile road network, irrigation systems that carried fresh water, and bridges for crossing rivers. One of their most considerable invention was their suspension bridges. They constructed them across steep canyons and fierce rivers, which connected two isolated areas and were instrumental in their empire's expansion.

Other inventions by them are Roads, Terrace Farming, Accounting systems, communication systems, Brain surgery and Freeze-drying.

Terrace Farming

Suspension Bridge



Quipu

Early Modern Age (1500 CE to 1900)

Technology in Europe

The technological history of the Middle Ages was slow but substantial development. In the succeeding period, the tempo of change increased markedly and was associated with profound social and intellectual upheavals in western Europe.

It all began with the Renaissance (in the 16th century) and was followed by a slew of technological breakthroughs by the time's geniuses, which laid the groundwork for the contemporary world.

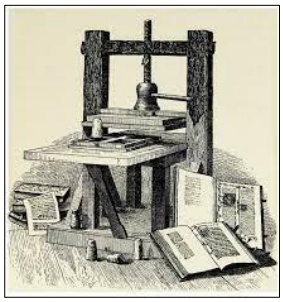
The industrial revolution of the 17th century was a pivotal event in the field of innovation. It shifted economies from hand-production to large-scale mechanized production and the factory system. Due to it, existing industries became more productive and efficient thanks to new machinery, new power sources, and new work arrangements. All this led to the emergence of Modern Western technology, which framed new postulates and theories that changed the viewpoint of science forever.

Some great inventions of the era are Steam engines, automobile vehicles, plastic, Compass, Printing press, Airplane, Medical Drugs, telescope etc, and indispensable theories about the working of science. These advancements have all influenced our way of life in some or the other manner.


Steam engine


Telescope


Bulb


Printing Press

Technology in the contemporary world (1900 to Present)

Today, technology has an entirely new look and face. It is a cumulative sum of all the advancements made throughout humanity's timeline. With respect to the recent history of technology, however, one fact stands out clearly: despite the enormous successes of technology by 1900, the following decades saw more progress across a wide range of activities than the entire previously documented history. The aeroplane, the rocket and interplanetary probes, electronics, atomic power, antibiotics, insecticides, and a host of new materials have all been devised and developed to create an unprecedented social scenario, full of opportunities and dangers, which was nearly impossible before the twentieth century.

Since the turn of the last 20th century, technology has shifted its focus from mechanical development to digitization. The invention of the Analytical Engine (the precursor to the modern-day computer) by Charles Babbage in the late 19th century and that of the telegraph are believed to have kickstarted the Digital Revolution (Industrial revolution 3.0). This was followed by a slew of new inventions in the field such as the Voder, Internet, World Wide Web, Wireless Telegraph, etc.

Today, we are on the brink of stepping into the fourth Industrial Revolution- Industry 4.0. The Fourth Industrial Revolution is building on the Third revolution i.e. the digital revolution. It is characterized by a fusion of technologies that break the lines between the physical, digital, and biological universes. This aims to — use intelligent information systems to collect, transmit and use data. Artificial Intelligence, the Internet of Things (IoT), Big Data, Robotics, Cloud Computing, and Autonomous Vehicles are just a few of the powerful technologies that have emerged as a result of this revolution. On top that, from a broader perspective, there is no end to this age of information.

Conclusion

The adoption of computers and other aspects of digital technology has transformed how humans interact with their environment, and these changes continue to the day. It's difficult to predict what the future holds. However, substantial advances in energy, biotechnology, genetic engineering, quantum computing, nanotechnology, and other promising sectors are likely to occur shortly.

This advancement also has a potential negative impact. It predicted that we will likely approach Technological Singularity by this century that is when artificial intelligence surpasses human intelligence. But, like the disruption it brings, technology is neither an exogenous nor an endogenous force over which humans have no influence. We are responsible for influencing this evolution through our daily decisions as citizens, customers, and investors. Hence, we should utilize this chance and steer the Fourth Industrial Revolution towards a future that reflects our shared goals and values, which could lift humanity into a new collective and moral consciousness based on a shared sense of destiny.

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