

ROBOT CELEBRATES its 100th Birthday!

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ROBOTO!

ONE hundred years have elapsed since the word ROBOT became a part of the vocabulary of all world languages. The term robot is not only limited to science fiction but has now become familiar to everyone. This year is the centenary of the robot.

The credit for the origin of the term “Robot” goes to Czechoslovakia where this word was first introduced by Karel Capek (1890–1938), a famous Czech playwright in his play

R.U.R. (Rossum’s Universal Robots). This word has been derived from the Czech word Robota which means a labourer. In the play, robots had been displayed artificially made yet composed of flesh and bones like a man. The character Rossum is an English man who prepared an army of artificial men to manage the toilsome tasks. Although the play was composed in 1920, it was staged in 1921 and translated into English in 1923.

When 'Rossum's Universal Robots' was being translated into English, there was a feeling of uneasiness in translating the word robot as 'slave'. And so the word robot was taken as such in English also. This conveniently differentiated actual human slaves from artificial slaves. Not only English but other languages of the world also gave acceptance to the word robot.

Robots in common perception are metallic machines. But the robots conceptualised by Karel Capek could be called the androids of today as they were made of flesh and bones. Even today a robot is generally known to be a mechanical human-constructed of metal while an android is made of tissues and fibres like humans.

In the play, the protagonist called Rossum manufactured robots that looked exactly like humans but were devoid of any conscience, in large numbers. They did nothing else except working constantly, like a working machine. Although eventually all the robots together took control of the human beings resulting in the annihilation of the human species. In the play, although robots could not reproduce, yet a female and a male robot got involved in reproduction due to some manufacturing defects!

Robotic Laws

Isaac Asimov was the first to conceptualize the laws of robotics which he further refined after a detailed discussion with John W. Campbell Jr., editor of the famous American science fiction magazine, *Astounding Science Fiction*. Asimov's three laws that were built into every robot's positronic brain are:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey the orders given it by human beings except where such orders would conflict with the First law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second laws.

Asimov later added a new Zeroth law in which he replaced the word human with humanity to make the laws more comprehensive.

Robots in Science Fiction

When Asimov first brought up robots in his stories there started a spell of stories around the world where robots became the central characters. Asimov incorporated robot characters in his stories 'Reason' (1941) and 'Liar' (1941). One of the stories 'Evidence' (1946) gained a lot of popularity in which a politician robot won the election fooling the voters into believing he was actually a human being!

Robots were often described as a slave, a friend or a foe. After the Second World War (1945) destruction by the technology was often dreaded by story writers. Asimov himself wrote a story of a destructive robot, 'Little Lost Robot'. A great deal of stories, however, written by Asimov displayed a brighter side of a robot. Most of the stories written after 1950 were centred on the clash of a robot with a human being. British writer Peter Phillips (1920-2012) introduced a robot



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as a murderer in his popular story 'Lost Memory' (1952). An interesting episode of boxing match has been narrated in the story 'Title Fight' (1956) written by William Campbell Gault.

Asimov further enumerated the concept of future robots in his foundation series. In the story, 'Good News from the Vatican' written by Robert Silverberg a robot was elected as a pope. In other stories, robots were presented as lover, orphan, detective or even as a psychopath.

The rules of robotics were drastically broken during the decade of 1980-90 by Hollywood movies which displayed robots as antisocial beings as well as murderers. Robots hitherto were shown as manmade metallic machines. But in a very popular story 'Do Androids Dream of Electric Sheep?' written by famous science fiction writer Phillip K. Dick (1928-1982), the difference between a robot and a human was diminished.

Sophia – World’s First Robot Citizen

In 2015, there took place an astounding incident in the world of robots when a gynoid (a female android) named Sophia built by a Hong Kong-based company Hanson Robotics, was granted citizenship by Saudi Arabia.

Sophia made her first public appearance in March 2016 in Austin, Texas, USA. She had a conversation with the audience and media personnel and even answered their queries at public shows in overcrowded auditoriums. In October 2017, Sophia was granted citizenship by Saudi Arabia.

Sophia is capable of mimicking body language and facial expressions of human beings. She can talk easily on topics like weather. Sophia’s innovator and creator David Hanson states that this robot with artificial intelligence would utilize her citizenship to protect women’s fundamental rights.



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Multi-use Robots

Manufacturing of modern robots commenced from 1948 when William Grey Walter built robots named Elmer and Elsie in Burden Neurological Institute of England. But due to their shape and slow pace they were named tortoise robots. These robots, walking on three wheels themselves reached recharge sockets when running out of battery.

The first digitally operated and programmed robot was invented by George Devol in 1954. It was called Unimate. It laid the foundations for the modern robotic industry. It was bought by General Motors in 1960 for commercial use.

Subsequently, robots started being built for industrial use. Japan and Germany in 1963 made computers for executing various functions governed hitherto by humans. These robots were less expensive, swift and excellent in quality in comparison to human labour. They are being used in perilous places that are not safe for human beings. They are also being utilised in production industries, assembling of parts, packing, transportation, exploration of earth and space, surgery, war experiments, laboratory innovations and commercial production of consumer goods.

In the current scenario, the emphasis is being laid on insightful robots with artificial intelligence. Vehicles without drivers and robots that draw out minerals from mines are being evolved. Demand for robots with artificial intelligence is mounting in restaurants for the job of waiters and the field of teaching and education. A robot named Marge is fitted

with the knowledge of alphabets and can read newspapers as well as edit spelling mistakes with the help of software. A robot recently even wrote a full-page op-ed article. “I have no desire to wipe out humans” the AI robot named “GPT-3” thus began its article in The Guardian (8 September 2020).

Mobile robots are also being utilised for military and security purposes. Explorations are being carried out on the development of their advanced forms. Robots which are deployed for domestic help fit in this category. Besides, a trend of constructing robots similar to human beings in features and shape has ensued – these are called androids. In science fiction, an android resembles a human being in form. Android is a Greek word meaning human or man. And now a robot has even been granted citizenship of a country.

A robot today is known as a machine especially programmed by a computer and capable of performing a series of tasks. They can have the complete or partial capability of self-operation. Honda’s ‘Advanced Step in Innovative Mobility’ (ASIMO) and Tosy’s ‘Ping Pong Playing Robot’ (TOPIO) are amongst a few outstanding examples of the robots in a human form or an android.

Besides, industrial robots, medical operating robots, dog therapy robots and nano-robots have been developed to serve humans. Efforts are being made to introduce artificial intelligence and cognitive abilities in today’s robots which could be expressed in demanding situations. Automatic cars and some domestic robots are included in this category.

Journey from a Robot to a Chatbot

Humanoid robots have today evolved into chatbots as well. We often get information through various media e.g. digital service providers and google assistants through these chatbots. They chat with us so spontaneously as human beings.

A chatbot is a software application that engages in an online chat. It can communicate through text-to-text or text-to-speech. The word chatbot was coined by Michael Mauldin in 1994. Their utilisation has expanded in a lot of consumer services today such as vocational (e-commerce), education, entertainment, health and even for presentation of news.

Many companies today have chatbots as messengers. They are skilled in sending and replying to SMS as well as dealing with conversations related to sales and marketing. Social media platform Facebook also started using it from 2016. Certain airlines communicate with their passengers through Facebook messenger platform. The Maharashtra state government in India uses a platform named Aaple Sarkar in various public services.



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The branch of technology related to practical application, design, production and various other usage of a robot as well as associated with computer systems and information processing is known as robotics. This technology is soaring rapidly as automatic machines are replacing human beings in hazardous environments. There is even a robot that can chat like a human – a Chatbot.

Human-like Robots

There are probabilities that very soon one might fail to distinguish between a robot and a human being. The form of robot that has reached this level can be tested through a method called 'Turing Test'. A Turing Test is a method of inquiry in artificial intelligence for determining whether a computer is capable of thinking like a human being or not. The test is named after Alan Turing (1912 -1954), an English computer scientist, cryptanalyst, mathematician and theoretical biologist.



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The test was introduced by Turing in his research paper, 'Computing Machinery and Intelligence' (1950), while he was working at the University of Manchester as a professor. He described it calling the 'imitation game'. If an evaluator is unable to distinguish between the machine and human behaviour then it is believed that the machine (AI) has passed the Turing Test. Presently various other forms of this test are also in vogue. Futurist Ray Kurzweil predicts that by 2029 computers would be built which would pass the Turing Test and thus Artificial Intelligence would outsmart the human brain in computational capabilities.

Should robots have some ethics to follow? According to Verner Vinge, a robot specialist, computers and robots would be smarter than a human being in the future; this state is called singularity. The Association for the Advancement of Artificial Intelligence (AAAI) organised a scientific conference on this topic in 2009. The subject of concern was that some robots are able to develop cognizance about their own existence which includes other additional abilities than merely looking for the power socket or reaching its target. There is an essential need to keep an eye on the manufacturing of these types of robots.

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