



Artificial Intelligence on the Move: A Revolutionary Technology

Vatan, Avinash Sharma, Sandip Goyal

Abstract: People have used technology to improve themselves throughout the human history. From the ancient times, human beings tried to get their work done by human slaves or inanimate machines. To build intelligent agents each new technology has been exploited. Clockwise, hydraulics, telephone switching systems, holograms, analog computers and digital computers have all been suggested both as mechanisms for intelligent agent and as technological metaphors for intelligence. A new invention of computer system is known as Artificial Intelligence that can perform tasks with the help of human intelligence. Artificial Intelligence associated with computer systems which includes various types of intelligence: systems that understand new concepts and tasks, systems that are able to give reason and draw useful conclusion about the world around us, systems which can learn a natural language and comprehend a visual scene. Artificial Intelligence means intelligence that is demonstrated by machines. This is a device that recognizes its environment and takes action that increases the chances of achieving its goal. The research goal of Artificial Intelligence is to create technology which helps computers and machines to perform various tasks in an intelligent manner. Artificial Intelligence analysis the intelligent acts of computational agents. Computational agent is one whose decisions about his/her actions can be explained in terms of computation. His actions, firstly, may be broken down into primary operation that further can be applied in a physical device. Computations have many forms, for example: In humans, it is in the form of “wetware” and in computers it is in the form of “hardware”. Greatest advances have occurred in the field of game playing. Super computer named Deep Blue defeated world chess champion Gary Kasparov in May, 1997. This research article explains history, features and goals of artificial intelligence. It also explains various types of artificial intelligence like reactive machine, limited memory, theory of mind and self-awareness. This article focus on application of artificial intelligence in many fields like literacy, finance, heavy industries, hospitals, news, publishing, transportations, telecommunication maintenance, telephone and online customer services etc.

Keywords: Intelligence, Reactive, Perception, Fuzzy, Robot.

I. INTRODUCTION

A new invention of computer system is known as Artificial Intelligence that can perform tasks with the help of human intelligence. Artificial Intelligence associated with computer systems which includes various types of intelligence: systems that understand new concepts and tasks, systems that are able to give reason and draw useful conclusion about the world around us, systems which can learn a natural language and comprehend a visual scene. Artificial Intelligence means intelligence that is demonstrated by machines.

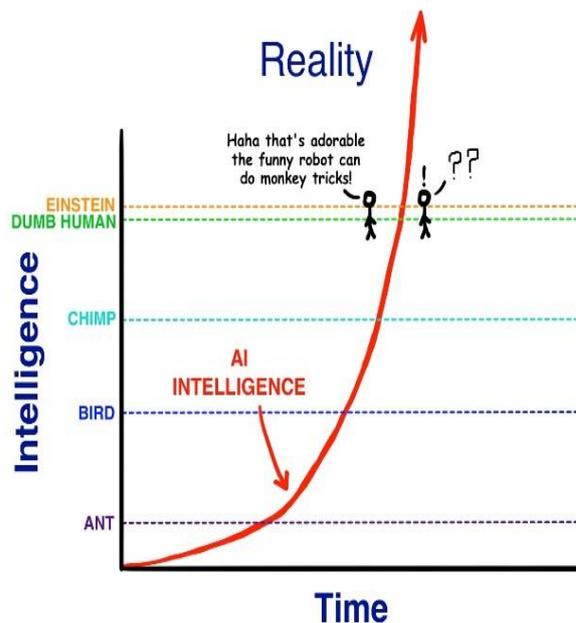


Fig:1 Real Perception of Intelligence

Manuscript published on November 30, 2019.

* Correspondence Author

Vatan*, B.Tech. Degree in Computer Science and Engineering from Maharishi Dayanand University, Rohtak

Avinash Sharma, Professor, Maharishi Markandeshwar Engineering college, Mullana, Ambala (Haryana)

Sandip Goyal, Professor, Maharishi Markandeshwar Engineering college, Mullana, Ambala (Haryana)

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

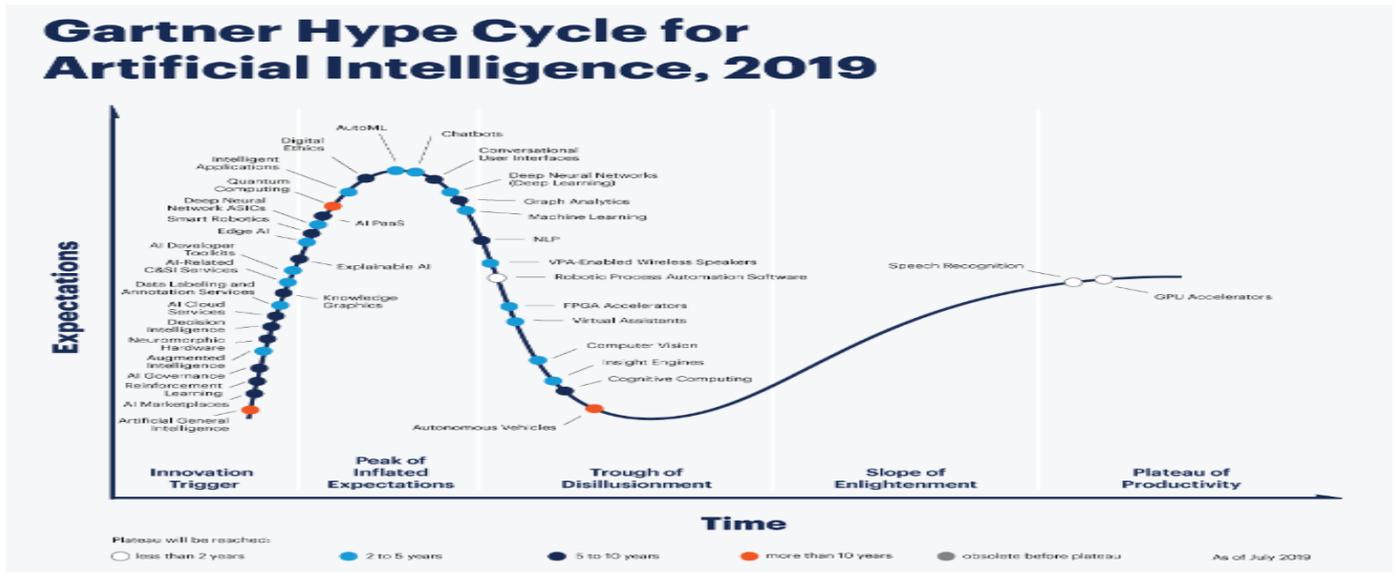


Fig:2 Top Trends on the Gartner Hype Cycle for Artificial Intelligence, 2019

This is a device that recognizes its environment and takes action that increases the chances of achieving its goal. The research goal of Artificial Intelligence is to create technology which helps computers and machines to perform various tasks in an intelligent manner. Artificial Intelligence analysis the intelligent acts of computational agents. Computational agent is one whose decisions about his/her actions can be explained in terms of computation. His actions, firstly, may be broken down into primary operation that further can be applied in a physical device. Computations have many forms, for example: In humans, it is in the form of “wetware” and in computers it is in the form of “hardware”. Greatest advances have occurred in the field of game playing. Super computer named Deep Blue defeated world chess champion Gary Kasparov in May, 1997.

II. HISTORY OF AI RELATED TO HUMAN THOUGHT PROCESS:

People have used technology to improve themselves throughout the human history. From the ancient times, human beings tried to get their work done by human slaves or inanimate machines. To build intelligent agents each new technology has been exploited. Clockwise, hydraulics, telephone switching systems, holograms, analog computers and digital computers have all been suggested both as

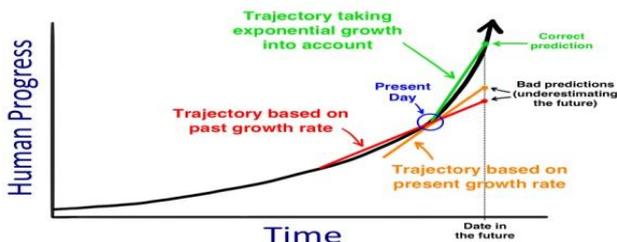


Fig:3 When it comes to history, we think in straight lines

mechanisms for intelligent agent and as technological metaphors for intelligence. Hobbes (1588-1679), The

‘Grandfather of Artificial Intelligence’, supported the position that thinking was symbolic reasoning like getting an answer with pen and paper. Further, this idea of symbolic reasoning was developed by Descartes, Pascal, Spinoza, Leibniz and others who were pioneers in the philosophy of

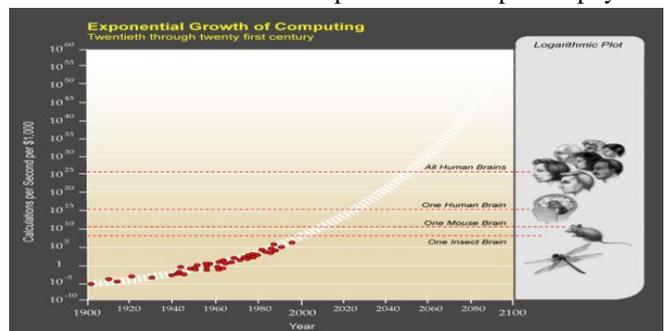


Fig: 4 Exponential Growth of Computing

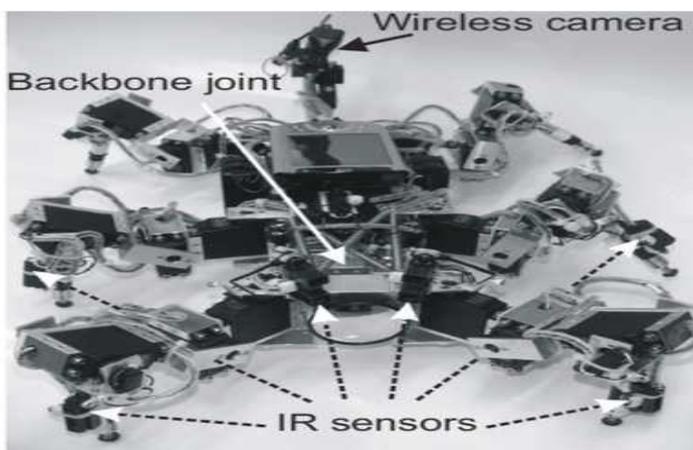
mind. The developments of computers have made the idea of symbolic operations more solid. Charles Babbage designed the first general purpose computer named Analytical Engine. There was much work done with the understanding of computation in the 20th century. There were proposed many models of computation including the Turing Machine by Alan Turing, which is a theoretical machine that writes symbols on an infinitely long tape and the Lambda calculus of Church that is a mathematical formalism for rewriting formulas. When real computers were built, Artificial Intelligence program was the first application of computers. As the foundations of the computer science these programs focused on learning and search, which include checkers program, logic theorist and formal neuron. An agent should have a suitable target language for the educated knowledge. Making natural language that can understand systems in limited domains was a great success during the 1960s and 1970s.



For example: **Daniel Bobrow** made the **STUDENT** program, **Winograd** made the **SHRDLU**, **Warren and Pereira** made the program named **CHAT-80**. An extreme work done on expert systems during 1970s and 1980s with goal was to capture the knowledge of a proficient in some area so that a computer can carry out knowledgeable tasks. For example: in the field of organic chemistry **DENDRAL** program was developed from 1965 to 1983 to diagnose spreading diseases of the blood, a program **MYCIN** was developed from 1972 to 1980. During the same time period Artificial Intelligence reasoning became popular in languages such as Prolog. There were more developments in the selected disciplines of Artificial Intelligence such as perception, probabilistic decisions from theoretical reasoning, planning, machine learning and many other areas during the 1990s and the 2000s.

III. FEATURES OF HUMAN INTELLIGENCE IN TERMS OF ARTIFICIAL INTELLIGENCE

1. It is a computerized machine that collects big data and proceeds it at high speed.
2. It is selection of series that deal with computer machines with resolutions of complicated problems.
3. It is the technique and architecture of constructing smart computer that explains human mentality.
4. It comprises borrowing features from human mind and implements them as invention in a computer very friendly.
5. It has capacity to change possible reaction into intelligent reactions.
6. Adaptability-the use of modeling to refine responses to improve viability.
7. Artificial Intelligence has ability to communicate.
8. Artificial Intelligence has ability to plan.
9. It has great ability and capability in computation.



10. It has great future to develop millions of sensor inputs fundamentally and uniformly. For example: currently we have driverless cars from human drivers.
11. Mechanized machines of artificial intelligence are now applied for utmost dangerous activities like welding, severe high temperature activity and bomb defusing etc.
12. There are many problems of patients, hospitals and healthcare industries that are solving by artificial intelligence.
13. Artificial Intelligence chatbots is the biggest thing. It is basically a computer program that allows to interact via a chat interface.
14. Artificial Intelligence can be artistic as well as can write stories.

IV. TYPES OF AI MODELS TO FORMULATE HUMAN INTELLIGENCE:

Where are we in the AI revolution?

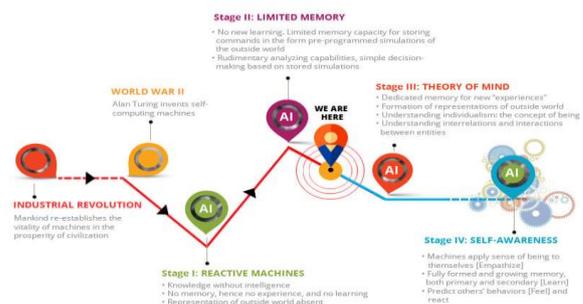


Fig:5 Is AI going to Replace humans?

Oral instructions, different images, ride cars and playing games are best understood by machines than human beings. There are four types of artificial intelligence.

1. **Reactive Machine:** Artificial Intelligence systems are absolutely active and have the

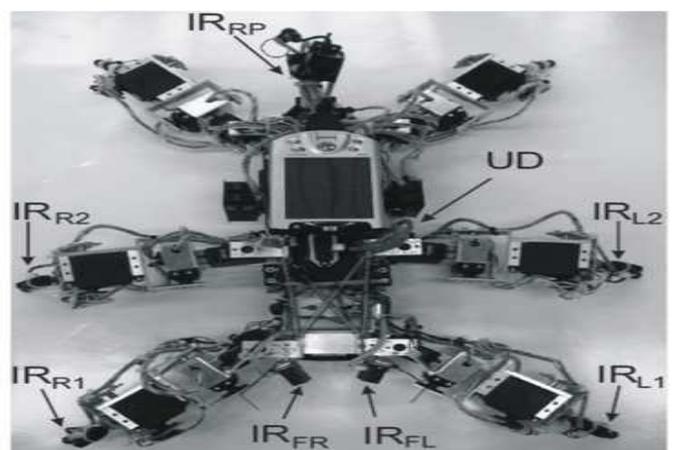


Fig:6 Biologically inspired six-legged walking machine AMOS-WD06.

capacity to communicate common conclusions without using former experiences and awareness. It explains that the machine observing the globe straightly and performing on what it recognizes.

Reactive Machine Learning

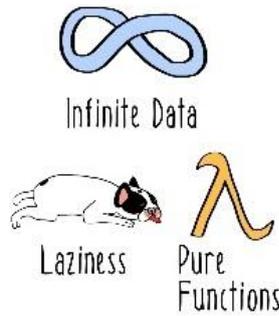


Fig:7 Learning Process in Reactive Machines

It does not depend on inner ideas of the globe. Machines have capacity to perform tasks that are assigned. For example: super computer named Deep Blue defeated world chess champion Gary Kasparov in May 1997. These machines are not able to participate mutually in the globe as imagine by human being instead Artificial Intelligence system will act absolutely the same way as it concurrence the similar situation every time. It is very good for confirming an artificial intelligence system is reliable.

2. **Limited Memory:** It contains the machines which deal with former experiences.

Table:1 Comparative-results-of-limited-memory-Biggs-BFGS-Yuans-BFGS-and-L-BFGS-methods-with m=5

Test Problems	Biggs'	BFGS	Yuan's	BFGS	L-BFGS	
	n_I	n_f	n_I	n_f	n_I	n_f
Trigonometric						
$n = 8$	24(3)	28	22(3)	29	24	31
$n = 200$	39(3)	46	46(4)	52	40	45
$n = 1000$	46(5)	52	46(5)	54	48	45
Rosenbrook						
$n = 8$	35(3)	47	32(3)	41	38	49
$n = 200$	34(3)	46	34(2)	46	36	45
$n = 1000$	34(3)	44	35(3)	51	37	48
Powell						
$n = 8$	31(3)	35	35(3)	38	46	54
$n = 200$	42(3)	48	34(4)	43	37	46
$n = 1000$	37(3)	40	33(3)	56	67	78
Beale						
$n = 8$	14(3)	16	14(3)	16	15	17
$n = 200$	14(3)	16	14(3)	17	15	16
$n = 1000$	14(2)	17	14(3)	19	15	16
Wood						
$n = 8$	83(3)	103	90(4)	118	91	118
$n = 200$	81(3)	104	84(2)	108	91	121
$n = 1000$	94(3)	123	88(3)	114	99	128
Total	622	765	621	802	699	857



Fig:8 Concept Formulation of Limited Memory AI

For example: self-driving cars notice acceleration and control of other cars. These observations are added to

the universe which

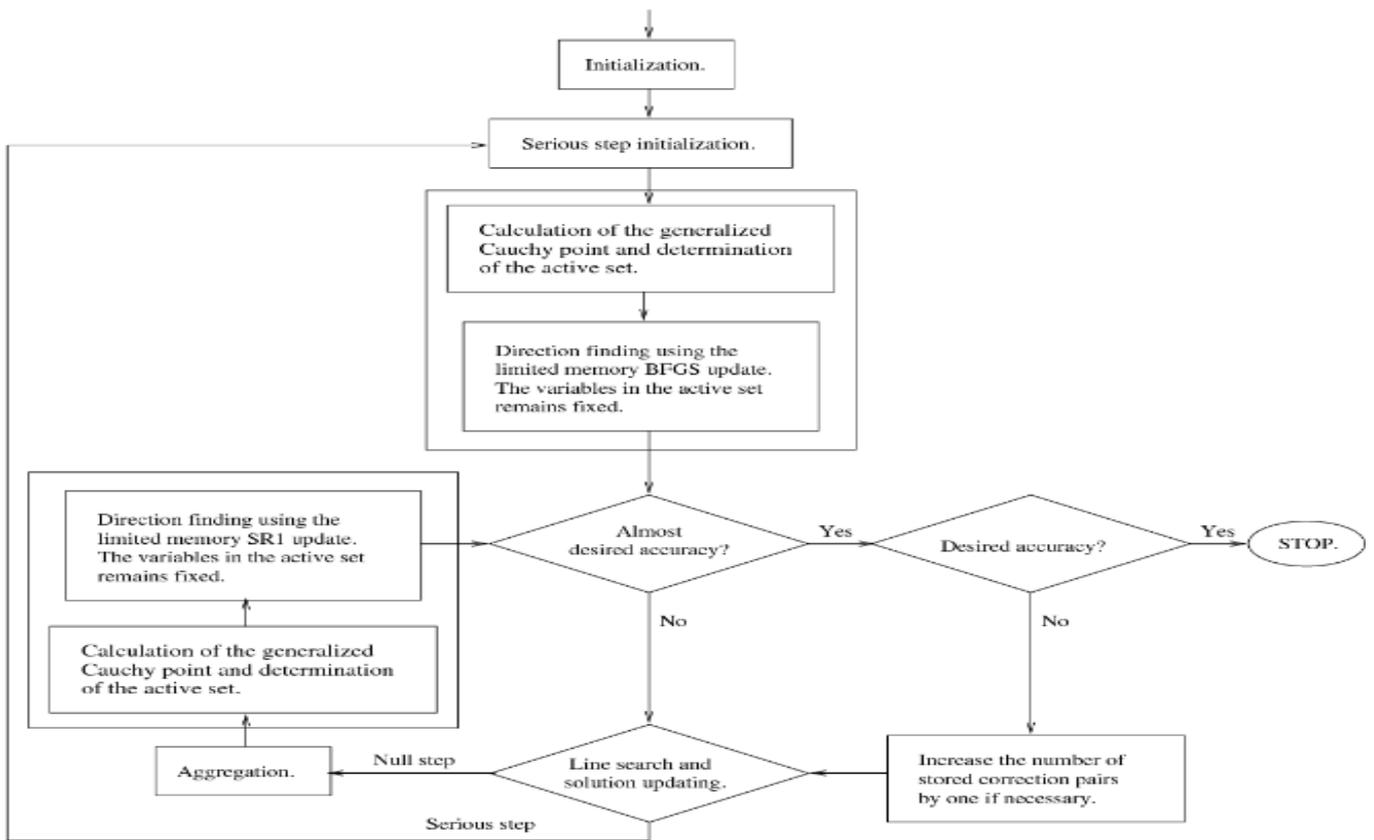


Fig:9 Adaptive limited memory bundle method with bounds.

involves highways, stop-lights and curves in the road. These observations also involve decisions of the cars regarding changing lanes and to avoid accidents. But these observations are only temporary. They are not part of the car’s knowledge which car can use as the way human beings assemble knowledge over years.

3. **Theory of Mind:** This type of artificial intelligence distribute between the existing machines and the machines which will come in

future. Future machines will be more excellent than existing machines. These will not only make representations about the universe but also about other representatives in the universe. In Psychology, that understand the effect of thoughts and emotions of the people, substances and creatures in the world on their own behavior is called “Theory of Mind”.

This is important for people to build communities because communities gave us permission to have communal communications. It is very difficult to work together without considerate everyone’s ideas and intentions, and without understanding what someone else recognize either about me or the environment. If artificial intelligence systems are actually walk between us anytime, they will have to understand that individual has ideas, feelings and believes for how we will be

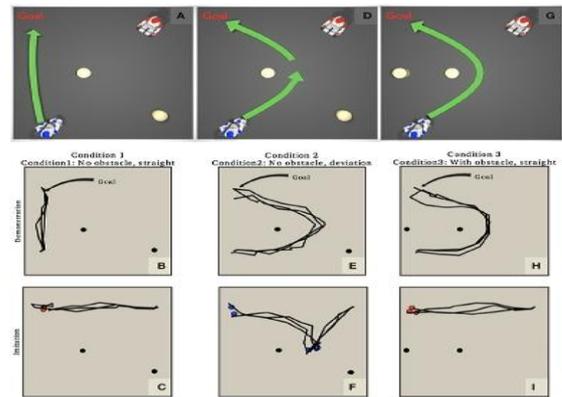


Fig:10 Frontiers | Experiments in Artificial Theory of Mind

acting, and artificial intelligence will readjust their act accordingly.

4. **Self-Awareness:** This is continuation of the “Theory of Mind”. Development of artificial intelligence is to create systems that can make representations about themselves. Self-awareness is also called consciousness for a reason. Conscious persons are knowledgeable themselves, recognize their inside attitude and are capable to forecast others feelings. Human beings are perhaps far away from making self-aware machines. We should target our acts

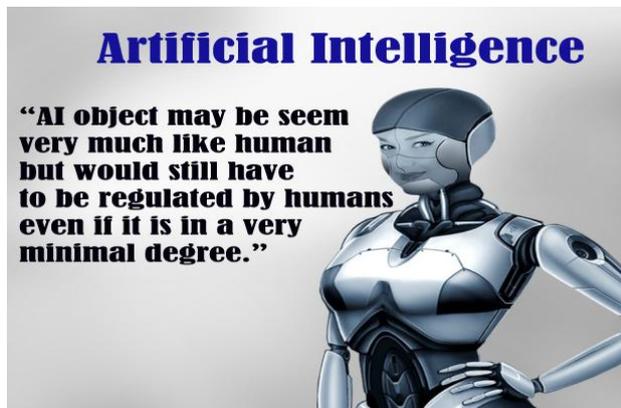


Fig:11 Self Aware AI Robots.

towards understanding memory, information and the capacity to make judgments based on previous knowledge.

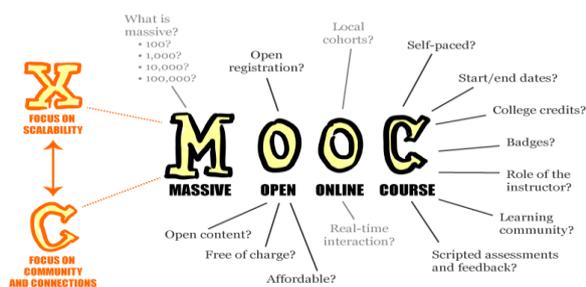


Fig:12 Massive Open Online Courses

V. GOALS OF AI BASED HUMAN INTELLIGENCE:

The main goal of artificial intelligence is to create technology that helps computers and machines to perform various tasks in an intelligent manner. The following goals include particular proficiency that researchers assume an intelligent system to present:

- 1. Scientific Goal:** To explain the laws that creates knowledgeable action potential in universal or manufactured systems to examine universal and manufactured assistants. Plan and check propositions regarding what needs to build knowledgeable agents. Plan, build and test with computers that perform various tasks in an intelligent manner.
- 2. Engineering Goal:** Construct valuable and knowledgeable facts based on past experiences. Correlation between analyzing intelligent flying machines and thinking machines.
- 3. Build Expert System:** Construct the systems that present knowledgeable action, memory, describes, determina and suggestions to its users.
- 4. To Enable Human Knowledge in Machines:** Constructing systems that perceive, believe, acquire information and act like human being.

VI. APPLICATIONS OF AI IN HUMAN INSPIRED DOMAINS:

- 1. Literacy:** There are many enterprises that develop machines for coaching many subjects to children varying from biology to computer science. There have been improvements in Intelligent Tutoring System of higher studies. For example: SHERLOCK, educate mechanics of air force to identify electronic problems in airplane. One more organization is Defense Advanced Research Projects Agency that madeuse of artificial intelligence to establish an electronic teacher to educate service persons of its naval force in technological skills in smaller time. Improvements in computer system mixed with artificial intelligence have also allowed automated evaluation of assignments and computer skills of students. This shows an increase in recognition of MOOCs (Massive Open Online Courses) which acknowledge learners from different regions of the world to attend classes online. Datas collected from these techniques of artificial intelligence have also enable learning analysis, which further used to increase the quality of education.

- 2. Finance:**
 - A) Market analysis and Data mining:** Various big monetary establishments have endowed in computing instruments to help with their transaction exercises. BLACKROCK’s computing instrument ALADDIN, is

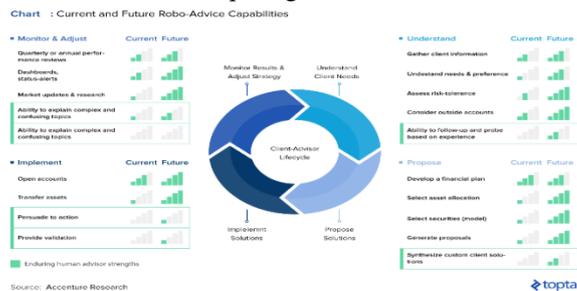


Fig:13 AI and Finance Improvement System

employed both inside the corporation and to customers to assist with transaction selections. Its vast range of capabilities comprises the application of machine intelligence to browse content like information from news, reports of financial experts and feedback from internet. Financial institutions use a machine intelligence engine referred to as SQREEM that may supply information to expand the profile of consumers and continue them with the good governance product that they had presumably wish.

- B) Personal Finance:** Various manufacturers are increasing the use of computing techniques to help human beings with their particular assets.

An app 'Digit' is mechanized by artificial intelligence that mechanically assists customers improve their expenditures and saving depends on their individual impulsions and ambitions. That app may examine determinants like money earned by an individual, current balance and expenditure habitude then makes very own preferences and send cash to the account for saved money. WALLET, an app of artificial intelligence in San Francisco that used to find assistants which further examine information of a consumer to tell them about their expenditure habits.

- C) **Algorithmic Trading:** Computative commercialism includes the utilization of advanced artificial intelligence structures to create commercialism choices of importance very quickly than any individual, typically creating innumerable trades in a day without human intervention. Computerized commercialism systems are generally utilized by big corporate financiers.

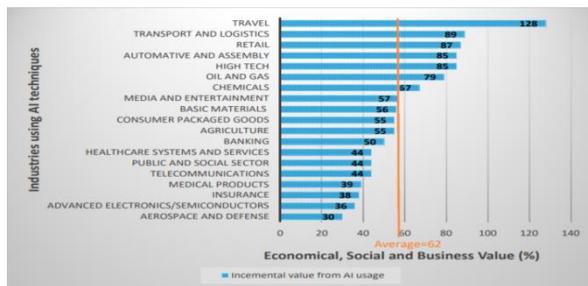


Fig:14 The performance improvement from AI

- D) **Underwriting:** An electronic banker start examine huge bundle of consumer information and make use of expert algorithmic systems to establish models of credit risk that measure the probability of a consumer being fail. Their electronic components are commissioned to financial institutions for them to influence for his/her countersign method. Zest finance refined their zest automatic machine intelligence program particularly for credit countersign. This program makes use of machine intelligence to research millennial established and advanced variables utilized in the trade of credit to attain purchasers. This program is especially helpful to allocate points of credit to the particular with restricted experiences.
 - E) **Portfolio Management:** Robo advisers are extensively employed in financial institutions. They supply monetary recommendations and portfolio guidance with minimum human interference. These monetary consultants work depend on conclusions designed to certainly establish a monetary portfolio in accordance with the financial aims of gains and losses of the consumers. It may adopt adjustments inside the market and appropriately improve the portfolio.
3. **Heavy Industries:** Robots have become ordinary in various companies and are usually provide employment that are thought to be hazardous to individuals. Fig:14 The performance improvement from AI in Industries. Robots have proved productive in many

occupations that are really repetitious which can create errors or misfortune due to a fault in application and different occupations that human beings may dislike strongly. In 2014, all (Japan, China, The United States, The Republic of Korea and Germany) together disclosed 70% total sales of robots. Japan had the topmost density of robot industries within the world.

- 4. **News, Publishing and Writing:** The enterprise Narrative Science create bulletin and summaries of business in english containing abstract of supporting events of team based on numerical data from the game. It also forms analyses of business reports. **Eachbox** is a computer program that advice publishers to expand data translation by posting stories brilliantly on internet. It reviews how particular audiences understand different stories at different times of the day. It then, select the best times of posting the best stories. It applies both

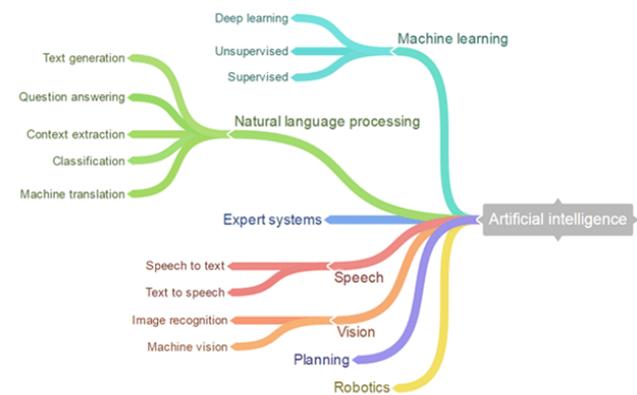


Fig:15 Artificial Intelligence and its Use Cases in Publishing

actual and real time data to get the idea what has processed in the past in addition to what is trending on the net at present. **Boomtrain's** is other example of artificial intelligence that is designed to learn how to make busy every reader with the precise articles-sent through the proper agency at the correct time that is best to the reader. Another enterprise **Yseop**, apply artificial intelligence to change organized data into brilliant explanations and suggestions in human language.

- 5. **Hospitals and Medicine:** Artificial intelligence is used in hospitals and medicine sectors for medicative diagnosing, for instance: Concept Processing is a technology of artificial intelligence in EMR software. Different tasks in medication that may be accomplished by expert systems and are starts to be developed include:
 - Analysis of medical pictures by artificial intelligence. These systems assist in scanning of digital pictures.
 - Discovery of a tumour is a typical application of this.
 - Examination of the sound of Heart.
 - Friendly robots caring for the old.
 - Design treatment plans.

- Mining medical records to supply additional helpful information.
- Drug creation.



Fig:16 Transportation - Traffic Management with AI

Provide consultations.

- Help in repetitive jobs together with medication management.
 - Forecast the possibility of death from medical procedure.
 - Forecast HIV progress.
 - Practicing avatars in the name of patients for clinical preparation.
- 6. Telecommunication Maintenance:** Numerous electronic companies employ curious exploration for managing their manpower. For instance: BT Group has utilized curious exploration in a arranging application that support the work timetable of 20,000 engineers.
- 7. Transportation:** Fuzzy logic executives have advanced for electronic gearboxes in cars.

Fig:16 Transportation - Traffic Management with AI

At present cars have many features like automatic parking and foremost cruise controls that is based on artificial intelligence.

Techniques of artificial intelligence have been used to develop applications for traffic management that successively decreases wastage of energy, wait times and transmission of gases by maximum amount of 25%. In the upcoming times, completely autonomous automobiles to be refined. Artificial intelligence is expected to supply secure, economical and careful transport as long as reducing the influence on atmosphere and societies.

- 8. Telephone and Online Customer Services:** Artificial intelligence is enforced in computerized helper that can be seen as avatars on internet. It can be appropriate for companies to decrease their application and preparation cost. A major essential technology to such program is machine intelligence. Pypestream apply computerized client aid a 'mobile app' designed to concentrate on exchanging information with clients. Many firms are contributing in artificial intelligence to check tough clients in the upcoming time. Google's highest up-to-date advancement examines communication and changes into sentence. The program can recognize

annoyed clients through their speech and answer accordingly.

- 9. Media:** Extraordinary artificial intelligence is prepared towards the determination of audible media content, for instance: cinema, TV videos, endorsement programs or consumer generated content. The explanation generally includes computer perception that is chief application area of artificial intelligence. The inspiration for utilizing media analysis by artificial intelligence can be among different things- assist in media exploration, the formation of a collection of explanatory keywords for a broadcast item, broadcast content policy, control, discussion to text for ancient and the discovery of trademarks, goods or celeb faces for the placing of appropriate commercial. Movies that are supported artificial intelligence are Bicentennial Man (1990), Blade Runner (1982), I Robot (2004), Ex Machina (2005), Artificial Intelligence (2001).

VII.CONCLUSION:

Artificial Intelligence has various aspects in modern community. More specially, one form of artificial intelligence (Weak Artificial Intelligence) has used in which many programs have been developed to produce particular tasks. This form is appropriate for various activities like medical diseases, computerized dealings, android and remote sensing. Artificial Intelligence has been used in many trades and fields including banking, sanitarium, literacy, transport etc.

REFERENCES:

1. David Poole & Alan Mackworth, "Artificial Intelligence: Foundations of Computational Agents", Second Edition.
2. Stuart J. Russell & Peter Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, 2003.
3. Patrick Henry Winston, "Artificial Intelligence", Third Edition.
4. Tom M. Mitchell, "Machine Learning", McGraw Hill.
5. https://en.wikipedia.org/wiki/Artificial_Intelligence.
6. Maad M. Mijwel, "History of Artificial Intelligence".
7. https://en.wikipedia.org/wiki/Application_Of_Artificial_Intelligence.
8. Goswami Gunjan, "Introduction to Artificial Intelligence".
9. Janakiraman V.S., Sarukesi K. & Gopalakrishan P., "Foundation of Artificial Intelligence and Expert Systems".
10. Genesereth, Michael R. & Nilsson, Nils J., "Logical Foundations of Artificial Intelligence", Morgan Kaufmann, 1987.
11. Boden, Margaret A, "Artificial Intelligence and Natural Man", Basic Books, 1977.
12. Boden, Margaret A. (ed.), "The Philosophy of Artificial Intelligence", Oxford, 1990.
13. Weizenbaum, Joseph, "Computer Power and Human Reason", Penguin, 1984.
14. Aleksander, Igor and Burnett, Piers, "Thinking Machines", Oxford, 1987.
15. Bench-Capon, T.J.M., "Knowledge Representation: An approach to artificial intelligence", Academic Press, 1990.

AUTHORS PROFILE



Vatan received the B.Tech. Degree in Computer Science and Engineering from Maharishi Dayanand University, Rohtak in 2012 and M.Tech. Degree in Computer Science and Engineering from Maharishi Dayanand University, Rohtak in 2015. He is now pursuing Ph.D. from MMEC, MMDU, Mullana, Ambala.



Presently Professor, Maharishi Markandeshwar Engineering college, Mullana, Ambala (Haryana) Constituent institution of Maharishi Markandeshwar University, Mullana is NAAC accredited 'A' grade deemed university & the first private engineering college of Haryana established in 1995. Also Dean Faculty of Engineering and Technology & Member of Board of Studies & DRC Committee for Research. Ex-Principal & Professor, Rajasthan College of Engineering for Women (Leading Women's Engineering College in the state of Rajasthan). Publications: International Journals: Published: 45 (Accepted: 61); International Conferences: Published: 90 (Accepted: 102) National Conferences & Workshops: 75 (Accepted: 110 & more) Text Books/EDITED: 06. Total Experience: 20 years (10 years PG) + 03 years Research International Conferences Organized: 10. He is an active member of advisory/technical program committee of reputed International/National conferences & reviewer of number of reputed Journals e.g. Springer, Elsevier Journal Computers & Electrical Engineering. Approximate 20 years of rich experience in Teaching, research and industry managing technical institution, serving in all capacity including Head of Department, Professor, Controller of Examination, Dean Academics Affairs, Principal etc.

Dr. Sandip Goyal is working as Professor, Maharishi Markandeshwar Engineering college, Mullana, Ambala (Haryana) Constituent institution of Maharishi Markandeshwar University, Mullana is NAAC accredited 'A' grade deemed university & the first private engineering college of Haryana established in 1995. Total Experience: 18 years (10 years PG) + 03 years Research. He is serving in all capacity including Head of Department, Professor.