IMPACT OF ARTIFICIAL INTELLIGENCE ACROSS BUSINESSES

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Abstract:

The present era is techno savvy era with the rapid growth of information technology around the world. One of the important concept of Information technology is Artificial Intelligence, usually known as AI has drastically changed the way in businesses perform their operations. The role of AI has been practiced by almost every type of business whether manufacturing sector or service sector. Today's generation smart phones and smart technology embedded products and equipments have their processing through artificial intelligence. The importance of AI in success, growth and development of businesses is phenomenal. The present paper is an attempt to highlight the impact and role of Artificial Intelligence across various types of businesses running in the world successfully.

Keywords: Artificial Intelligence, Business, Digital, India, Technology.

Introduction:

AI—a distinct branch of science and technology—has been practiced for over 60 years. Artificial intelligence (AI) refers to the ability of a computer or a computer-enabled robotic system to process information and produce outcomes in a manner similar to the thought process of humans in learning, decision making and solving problems.

The term Artificial Intelligence was coined by John McCarthy, an American computer scientist. He pioneered and invented the field devoted to intelligent machines. He was known as the father of Artificial Intelligence (AI). McCarthy defined AI as 'the science and engineering of making intelligent machines, especially intelligent computer programs.' By extension, the goal of AI systems is to tackle complex problems in ways similar to human logic and reasoning.

AI refers to the ability of machines to perform cognitive tasks like thinking, perceiving, learning, problem solving and decision making. Initially conceived as a technology that could mimic human intelligence, AI has evolved in ways that far exceed its original conception. With incredible advances made in data collection, processing and computation power, intelligent systems can now be deployed to take over a variety of tasks, enable connectivity and enhance productivity. As AI's capabilities have dramatically expanded, so have its utility in a growing number of fields.

Indian businesses, the government and individuals have, in recent years, also seen multiple use cases of AI in various facets of life. Digital assistants, cab aggregators, biometric recognition, targeted

advertisements and online recommendation engines are among the more common AI applications used today. Organizations have started realizing the efficiencies and growth opportunities that come with the automation of back-end processes, chat bots for customer services, machine learning for predictive maintenance in manufacturing, etc. Government bodies have employed AI-powered applications such as machine leaning, image and speech recognition, robotics and more to bolster defense equipment and techniques.

What does AI encompass?

AI is an over-arching concept that encompasses multiple (often overlapping) disciplines. These draw upon knowledge and techniques from mathematics, statistics, computer science and domain-specific expertise to create models, software programs and tools. These software programs and tools can undertake complex tasks with outcomes that are comparable, if not better, to traditional manual approaches.
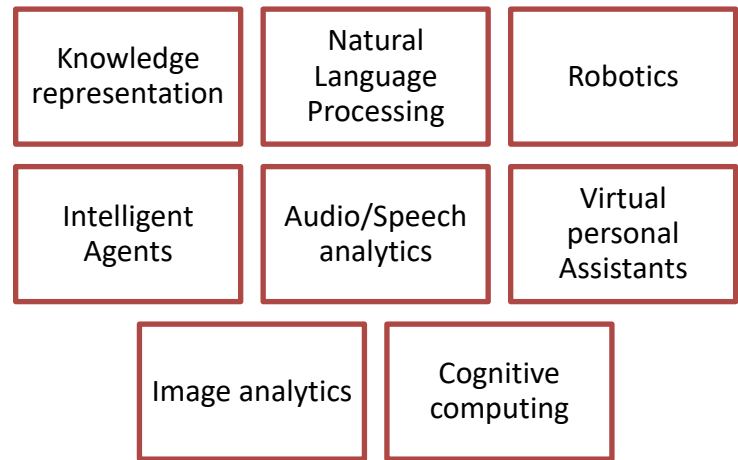

Figure: Topic Areas within AI

A continual challenge humans have been facing is identifying ways to perform certain tasks such as recognizing images and audio so that we can replicate similar functionalities using software applications. Machine learning systems try to mimic the learning processes of humans—that is, learning at scale from data and achieving levels of performance comparable to humans in processing it and arriving at certain outcomes. Financial institutions and hospitals have started utilizing AI systems for fraud detection and diagnosis of diseases to effectively harness the potential of their information and tackle more complex problems.

AI is expected to transform the way we humans live and work. This could be by helping with automating repetitive tasks and personalizing or customizing products and services for consumers with the ability to learn from specific preferences and interests. AI can be

deployed in hostile environments. For example, intelligent robots can be fed with information and sent for defusing bombs, thereby reducing risks to human life. AI systems can minimize occurrences of 'human error', assuming that they are programmed correctly and can help in making faster decisions using cognitive technologies.

With the increase in businesses providing personalized service to customers for a premium, people are willing to pay the extra price for customized and superior service by AI. However, they still need 'human touch' whenever required and cannot completely rely on having a fully functional artificially intelligent customer service system.

Areas where AI can create value:

AI holds the potential to address socioeconomic concerns such as stimulating economic growth, improving global health and education and helping enhance the quality of life for humans. AI systems like chatbots, digital assistants and robots can, at least partially, carry out customer service operations such as informing about new products/services, handling feedback and concerns and responding with solutions. AI applications hold the potential to automate a number of repetitive tasks such as entering timesheet hours and routine communication such as emails and paperwork. AI, when integrated into businesses, is expected to bring about higher productivity, efficiency and growth. AI managers at the workplace can improve fairness and transparency in conducting appraisals and giving promotions and raises at the workplace.

The usage of AI-powered solutions in organizations can be categorized as follows:

1. Machine learning
2. Decision support systems
3. Virtual private assistants
4. Predictive analytics
5. Robotics
6. Automated research and information aggregation
7. Automated data analyst
8. Automated sales analyst
9. Automated communications
10. Automated operations and efficiency analyst

Artificial Intelligence in Indian Context:

Artificial Intelligence (AI) is poised to disrupt our world. With intelligent machines enabling high-level cognitive processes like thinking, perceiving, learning, problem solving and decision making, coupled with advances in data collection and aggregation, analytics and computer processing power, AI presents opportunities to complement and supplement human intelligence and enrich the way people live and work.

India, being the fastest growing economy with the second largest population in the world, has a significant stake in the AI revolution. Recognising AI's potential to transform economies and the need for India to strategise its approach, Hon'ble Finance Minister, in his budget speech for 2018 – 2019, mandated NITI Aayog to establish the National Program on AI, with a view to guiding the research and development in new and emerging technologies.

NITI Aayog has decided to focus on five sectors that are envisioned to benefit the most from AI in solving societal needs:

a) Healthcare: increased access and affordability of quality healthcare,

b) Agriculture: enhanced farmers' income, increased farm productivity and reduction of wastage,

c) Education: improved access and quality of education,

d) Smart Cities and Infrastructure: efficient and connectivity for the burgeoning urban population, and

e) Smart Mobility and Transportation: smarter and safer modes of transportation and better traffic and congestion problems.

Data is one of the primary drivers of AI solutions, and thus appropriate handling of data, ensuring privacy and security is of prime importance. Challenges include data usage without consent, risk of identification of individuals through data, data selection bias and the resulting discrimination of AI models, and asymmetry in data aggregation.

AI is a constellation of technologies that enable machines to act with higher levels of intelligence and emulate the human capabilities of sense, comprehend and act. Thus, computer vision and audio processing can actively perceive the world around them by acquiring and processing images, sound and speech. The natural language processing and inference engines can enable AI systems to analyze and understand the information collected. An AI system can also take action through technologies such as expert systems and inference engines or undertake actions in the physical world. These human capabilities are augmented by the ability to learn from experience and keep adapting over time. AI systems are finding ever-wider application to supplement these capabilities across enterprises as they grow in sophistication.

Irrespective of the type of AI being used, however, every application begins with large amounts of training data. In the past, this kind of performance was driven by rules-based data analytics programs, statistical regressions, and early "expert systems." But the explosion of powerful deep neural networks now gives AI something a mere program doesn't have: the ability to do the unexpected.

AI gets categorized in different ways and it may be useful to understand the various categories, their rationale and the implications.

a) *Weak AI vs. Strong AI*: Weak AI describes "simulated" thinking. That is, a system which appears to behave intelligently, but doesn't have any kind of consciousness about what it's doing. For example, a chatbot might appear to hold a natural conversation, but it has no sense of who it is or why it's talking to you. Strong AI describes "actual" thinking. That is, behaving intelligently, thinking as human does, with a conscious, subjective mind. For example, when two humans converse, they most likely know exactly who they are, what they're doing, and why.

b) *Narrow AI vs. General AI*: Narrow AI describes an AI that is limited to a single task

or a set number of tasks. For example, the capabilities of IBM's Deep Blue, the chess playing computer that beat world champion Gary Kasparov in 1997, were limited to playing chess. It wouldn't have been able to win a game of tic-tac-toe - or even know how to play. General AI describes an AI which can be used to complete a wide range of tasks in a wide range of environments. As such, it's much closer to human intelligence.

c) *Super intelligence*: The term "super intelligence" is often used to refer to general and strong AI at the point at which it surpasses human intelligence, if it ever does.

Source: Accenture

Role of AI in Business Organizations:

Adoption of AI by various sectors has been influenced by; among other factors, technical and regulatory challenges, but commercial implications has been the biggest determinant. While technical feasibility, availability of structured data, regulatory barriers, privacy considerations, ethical issues, preference for human relationship have all played their roles in determining the readiness of a sector for large scale AI adoption; compelling business use cases (e.g. improved efficiency, accuracy, speed, forecasting and accurate decision making) that lead to direct impact on revenue and profitability have been the biggest driver for companies to pursue accelerated adoption of AI.
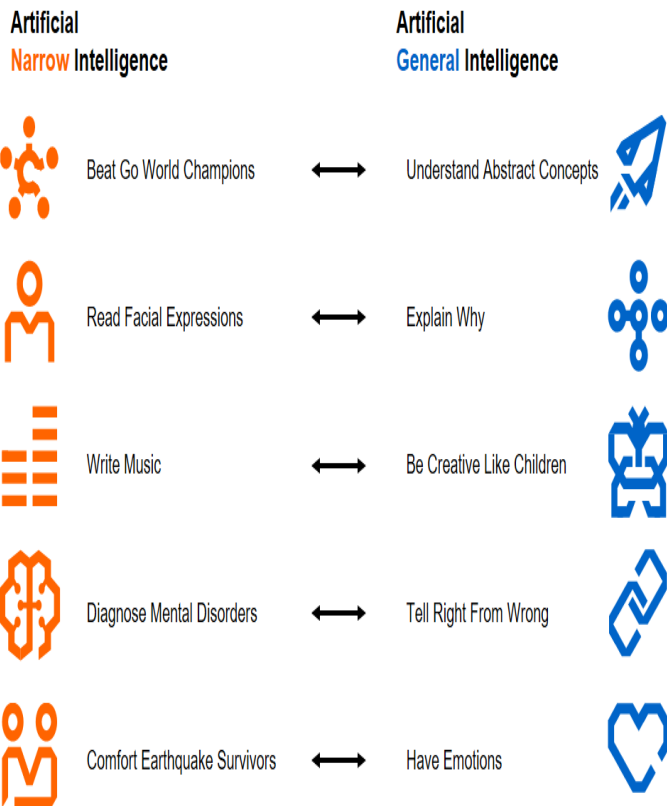
It comes as no surprise that Banking and Financial Services sector has been one of the leading sectors globally when it comes to AI adoption, and India has also seen a steep increase in AI based implementation in recent times. Existing and potential use of Artificial Intelligence in this sector include improved customer interaction through personalized engagement, virtual customer assistance, and chat bots; improved processes through deployment of intelligent automation in rule based back-office operations; development of credit scores through analysis of bank history or social media data; and fraud analytics for proactive monitoring and prevention of various instances of fraud, money laundering, malpractice, and the prediction of potential risks. AI in this sector has also been employed in wealth management viz. robo-advisory, algorithmic trading and automated transactions. Similarly, manufacturing sector, primarily automotive and

assembly, has been one of the first sectors to implement advanced robotics at scale. The manufacturing sector in India hasn't been far behind, as reflected in a recent study by BCG, where India was ranked 3rd in the world in AI implementation in manufacturing, ahead of nations such as Germany, with 19% of companies in the sector already using AI to a significant extent.

Artificial Intelligence has the potential to provide large incremental value to a wide range of sectors globally, and is expected to be the key source of competitive advantage for firms.

a) *Healthcare*: Application of AI in healthcare can help address issues of high barriers to access to healthcare facilities, particularly in rural areas that suffer from poor connectivity and limited supply of healthcare professionals. This can be achieved through implementation of use cases such as AI driven diagnostics, personalized treatment, early identification of potential pandemics, and imaging diagnostics, among others.

b) *Agriculture*: AI holds the promise of driving a food revolution and meeting the increased demand for food (global need to produce 50% more food and cater to an additional 2 billion people by 2050 as compared to today). It also has the potential to address challenges such as inadequate demand prediction, lack of assured irrigation, and overuse / misuse of pesticides and fertilizers. Some use cases include improvement in crop yield through real time advisory, advanced detection of pest attacks, and prediction of crop prices to inform sowing practices.

c) *Smart Mobility, including Transports and Logistics*: Potential use cases in this domain include autonomous fleets for ride sharing, semi-autonomous features such as driver assist, and predictive engine monitoring and maintenance. Other areas that AI can impact include autonomous trucking and delivery, and improved traffic management.

d) *Retail*: The retail sector has been one of the early adopters of AI solutions, with applications such as improving user experience by providing personalized suggestions, preference-based browsing and image-based product search. Other use cases include customer demand anticipation, improved inventory management, and efficient delivery management.

e) *Manufacturing*: Manufacturing industry is expected to be one of the biggest beneficiaries of AI based solutions, thus enabling 'Factory of the Future' through flexible and adaptable technical systems to automate processes and machinery to respond to unfamiliar or unexpected situations by making smart decisions. Impact areas include engineering (AI for R&D efforts), supply chain management (demand forecasting), production (AI can achieve cost reduction and increase Efficiency), maintenance (predictive maintenance and increased asset utilization), quality assurance (e.g. vision systems with machine learning algorithms to identify defects and deviations in product features), and in-plant logistics and warehousing.

f) *Energy*: Potential use cases in the energy sector include energy system modeling and forecasting to decrease unpredictability and increase efficiency in power balancing and usage. In renewable energy systems, AI can enable storage of energy through intelligent grids enabled by smart meters, and also improve the reliability and affordability of photovoltaic energy. Similar to the manufacturing sector, AI may also be deployed for predictive maintenance of grid infrastructure.

g) *Smart Cities*: Integration of AI in newly developed smart cities and infrastructure could also help meet the demands of a rapidly urbanizing population and providing them with enhanced quality of life. Potential use cases include traffic control to reduce congestion and enhanced security through improved crowd management.

h) *Education and Skilling*: AI can potentially solve for quality and access issues observed in the Indian education sector. Potential use cases include augmenting and enhancing the learning experience through personalized learning, automating and expediting administrative tasks, and predicting the need for student intervention to reduce dropouts or recommend vocational training.

Conclusion:

The concept of Artificial Intelligence has been practiced across almost every sector of business around the globe. For production, raw acquisition, quality control, product development, product promotion, business meetings, etc. all requires use and applications of Artificial Intelligence. The companies working in Indian Market are also practicing Artificial Intelligence. Even the household consumers feel it convenient to use products and services using concept of AI. The future will foresee the rapid growth and development of Artificial Intelligence techniques around the globe.

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