



Transformative Role of Artificial Intelligence in Development

¹Anjali, ²Dr. Vandana Verma, ³Dr. Ella Rani, ⁴Dr. Santosh Rani

¹M.Sc. Scholar, Department Of EECM, I.C. COCS CCS HAU, Hisar, Haryana

²Assistant Professor, Department Of EECM, I.C. COCS CCS HAU, Hisar, Haryana

³Assistant Professor, Department Of EECM, I.C. COCS CCS HAU, Hisar, Haryana

⁴Assistant Scientist, Department Of EECM, I.C. COCS CCS HAU, Hisar, Haryana

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ABSTRACT: Artificial Intelligence (AI) represents a pivotal advancement in technology, enabling machines to perform tasks that typically necessitate human intelligence. This paper delves into the multifaceted realm of AI, elucidating its stages, types, domains, and burgeoning applications across diverse sectors. Drawing from the categorization, AI is dissected into three stages: Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI), and the hypothetical Artificial Super Intelligence (ASI). The types of AI, ranging from Reactive Machine AI to Self-aware AI, showcase the spectrum of capabilities and limitations in current technology. Furthermore, the domains of AI, encompassing Machine Learning, Robotics, Expert Systems, among others, elucidate the breadth of applications, from healthcare to agriculture. The paper also underscores the trans-formative potential of AI across sectors such as healthcare, finance, media, transportation, logistics, e-commerce, manufacturing, energy, human resource management, and education. While AI offers unparalleled advantages in accuracy, speed, and reliability, it also presents challenges, including high costs and ethical concerns. Ultimately, a balanced and ethically-guided approach to AI deployment is imperative for harnessing its potential and fostering a future marked by innovation and sustainable progress.

KEYWORDS: Artificial Intelligence, Development, Transformative.

I. INTRODUCTION

Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. Artificial intelligence (AI), the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project

of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Artificial Intelligence is composed of two words Artificial and Intelligence, where Artificial defines "man-made," and intelligence defines "thinking power", hence AI means "a man-made thinking power. It is a branch of computer science by which we can create intelligent machines which can behave like a human, think like humans, and able to make decisions." The potential applications of AI are far-reaching, impacting industries such as healthcare, finance, transportation, and entertainment. From medical diagnostics and financial predictions to autonomous vehicles and personalized content recommendations, AI is revolutionizing the way we live and work.

II. REVIEW OF LITERATURE

Jujjavarapu, et.al (2018) pointed out that smart manufacturing initiatives are emerging in India. Companies like Wipro and Infosys have introduced AI platforms, while the Indian Institute of Science collaborates with Boeing Company and General Electric to develop a smart factory. Challenges in integrating AI into India's manufacturing sector encompass insufficient value generation, skill mismatches between required and existing talents, limitations in professional capacities, infrastructure gaps, and difficulties in accessing advanced technologies.

Kumar T and Trakru M (2019) concluded that integrating AI into E-commerce involves implementing visual and voice search, utilizing AI assistants and chatbots, optimizing logistics through smart solutions, and employing recommendation engines. The advantages include a customer-centric visual search method, enhancing sales processes by retargeting potential customers, achieving a higher



level of personalization, utilizing chatbots and virtual assistants, and improving customer recommendations while filtering out fake reviews.

Reddy S et.al (2019), emphasized the use of AI methods (including Machine Learning/Deep Learning, Natural Language Processing, Expert Systems, Computer Vision, and Robotics) in key sectors: patient management, clinical decision-making, patient surveillance, and healthcare interventions. The study highlighted that by understanding both the challenges and potential benefits of AI, one can determine the specific areas within the healthcare system where AI integration can truly benefit and make a significant difference.

Yawalkar Vivek V., (2019) delineated the significance of AI within HR, encompassing areas such as recruitment, screening, and interviews. AI aids in diminishing administrative tasks, curbing biases, boosting efficiency, and enhancing workplace education. However, the study also highlights that managing AI tools poses a significant hurdle for both the industry and HR divisions.

Bhbosale et.al. (2020) highlighted the benefits of AI, emphasizing that machines can operate continuously without experiencing fatigue or boredom. Both robotics and AI have the potential to be utilized in sectors like mining and fuel exploration, reducing risks to human lives. Furthermore, AI can be integrated into various industries and corporate settings. However, there are drawbacks: developing such machinery is challenging due to the high costs of equipment. Improper use of these machines can lead to significant damage. Additionally, as machines become more advanced, human involvement diminishes, and they can only execute tasks they are specifically designed or programmed for.

Meena et.al (2020), classified AI applications in the entertainment and media sector into three segments: marketing and advertising, user experience personalization, and search optimization. Within these categories, they pinpointed AI solutions such as improved advertising strategies, measures for privacy and content security, enriched customer interactions and content, and enhancements in services and processes.

Lakshmi Shankar Iyer (2021) outlined the advantages and functionalities of AI in constructing an ITS. The research introduced four components of the Intelligent Transport System: Intelligent traffic management, public transport coordination, safety oversight, and smart manufacturing & logistics. AI offers capabilities such as forecasting weather and traffic trends, managing roads, and notifying on-duty personnel. It has notably decreased road accidents by anticipating potential hazards based on road

conditions and promoting safety awareness among drivers. Additionally, the automotive sector leverages AI during vehicle manufacturing for enhanced processes.

Gunjan Dubey (2022) pinpointed several concerns and obstacles, including societal and parental reluctance to fully embrace AI-based education, socio-religious reservations towards AI integration, the absence of a comprehensive national AI policy, schools' challenges in transitioning to AI-centric education, and potential risks to traditional value systems. The study also elucidates various AI applications in education, such as tailored learning experiences, delivering high-quality content, ensuring equal learning opportunities, fostering interactive teaching methods, facilitating remote education, updating curricula, and managing student attrition.

Rajesh Saxena (2022) highlighted how AI is reshaping the education sector. Key AI technologies like Chatbots, Virtual Reality (VR), and Learning Management Systems (LMS) play pivotal roles in this transformation. Additionally, the NITI Aayog, a governmental body in India, introduced the National Strategy for Artificial Intelligence (NSAI) in June 2018, aiming to foster a thriving AI environment in the country. Projections suggest that by 2035, AI could constitute approximately 15% of India's existing gross value.

Arnesh Telukdarie and Aviksha Munger, (2023) concluded that AI in the banking sector can boost operational efficiency, elevate customer interactions, and enhance the overall client experience by mitigating risks and bolstering security. Furthermore, it can harness big data to access non-financial details like phone bills and other non-transactional information. Chatbots offer a solution by addressing client queries and presenting feasible answers. However, there are downsides: as banking becomes more available, the risk profile escalates. This accessibility might inadvertently exclude certain demographics, notably the elderly, and could result in potential job reductions. Moreover, if AI models are not properly trained with current data, they may produce inaccuracies in analyses.

Kaushik and Priyanka, (2023). Based on this study, implementing chatbots and AI-powered services could enhance patient contentment in the healthcare domain. This would improve operational efficiency, enable prompt responses from doctors to patient inquiries, and send appointment reminders. As a result, patients would experience reduced waiting periods and benefit from tailored solutions, leading to heightened satisfaction and well-being.



Mohd Javaid et.al (2023) explored AI's role in agriculture, encompassing various areas: forecasting weather conditions, enabling farmers to optimize outcomes, enhancing crop vitality, anticipating plant ailments, implementing automated tractors, refining decision-making processes, monitoring crops and soil health, furnishing detailed crop data, educating agricultural students, recognizing inefficient resource usage, spotting soil irregularities, recommending appropriate planting sites, offering insights on water conservation, identifying tiny pests, supporting the food distribution network.

Rinku, & Gurjeet Singh. (2023) addressed challenges in energy-focused AI, such as historical data gaps, antiquated power infrastructure, financial pressures, and opaque systems. It delved into the superiority of AI methods over conventional models in areas like control capabilities, enhancing energy efficiency, warding off cyber threats, managing vast datasets, optimizing smart grids, implementing predictive maintenance, and ensuring computational speed. AI is emerging as a pivotal instrument in the evolving, data-rich energy sector, offering a vital advantage to boost operational excellence and efficiency in a highly competitive landscape.

III. STAGES, TYPES AND DOMAINS OF ARTIFICIAL INTELLIGENCE (AI)

Following are the Stages, Types and Domain of Artificial Intelligence:

Stages of Artificial Intelligence (AI)

Following are the three stages of AI:

- [1]. **Artificial Narrow Intelligence (ANI):** It is also called as weak AI. It is the stage where AI includes machines that can do only specifically defined set of tasks. At this juncture, machines can carry out only those tasks which are predefined as it do not have thinking abilities. For example- Siri, Alexa, Sophia, the self-driving cars and so on.
- [2]. **Artificial General Intelligence (AGI):** It is also recognized as strong Artificial Intelligence (AI) and is considered as the advancement of AI where machines will have the thinking abilities and will able to make decisions as human beings do in general. But at present, we do not have such machines and it is being anticipated that scientists must come up with the machines which will be as smart as human beings.
- [3]. **Artificial Super Intelligence (ASI):** By this stage of AI, computer's abilities will outshine the human beings. Though, it is considered as the assumed or hypothetical stage showed in scientific movies and science fiction books where things are shown that how the machines will take over the world in future.

Types of Artificial Intelligence (AI)

Based on the functions, AI can be categorized into four types:

[1]. **Reactive Machine Artificial Intelligence (RMAD):** Such kinds of machines work only on present data by considering the present situations. RMAI cannot decipher inferences from the data in connection to evaluations of their futures course of actions.

[2]. **Limited Memory Artificial Intelligence (LMRI):** As the name advocates, it has limited memory and can have refined, informed and improved decisions from the memory of its past data. This kind of AI has the memory useful to store past experiences and for the evaluation of future course of actions.

[3]. **Theory of Mind Artificial Intelligence (TMAI):** It is regarded as the advanced kind of AI, and is predicted to have vital role in human psychology. The theory of Mind Artificial Intelligence puts emphasis on emotional intelligence for having better understanding about the pattern of human thoughts and believed. However, such kind of AI is not found fully developed yet but in this perspective many researches are going on round the clock. .

[4]. **Self-aware Artificial Intelligence (SAAD):** It comprises the machines which may have the power of their own developed consciousness that may lead to become self-aware. Like the theory of Mind Artificial Intelligence, it is also not developed yet.

Domains of Artificial Intelligence

Following are the different domains Artificial Intelligence (AI).

[1]. **Machine Learning:** It is a science that gets involve the machines in order to solve the problems by processing, analyzing and interpreting the data. Machine learning can supervise the unsupervised and reinforcement learning.

[2]. **Deep Learning:** It is also called as neuron network. The deep learning is concerned with executing neuron networks on high demands data to deal with insights and formulate solutions. The logics behind it are the face verification algorithm on Facebook and self-driving cars that said to have assistants like Siri and Alexa.

[3]. **Robotics:** It emphasizes on the applications of robots. AI robots are like the artificial agent which works in real world situations for producing results by taking into account the some actions. Sophia is named as the good example of the AI in robotics.

[4]. **Expert Systems:** It is a domain of AI in which computer system learns as well as reciprocates with the ability of decision making of a human expert. It can use its logic notions in resolving the complex problems. It is used in information management there



seen to use in fraud deduction, virus deduction and also in managing medical and hospital records and so on.

[5]. **Fuzzy Logic:** It is a computing based approach where it works on the principle of degree of truth. Fuzzy Logic is the Boolean Logic. It has the utility in medical field in terms of resolving complex problems including decision making issues. Moreover, it is also useful in performing the task of automating the gas system in cars.

[6]. **Natural Language Processing (NLP):** It is a system of processing the natural language which is called as the science of drawing insights from the natural language of human being. NLP is used in order to communicate with machines and online businesses, and the examples of NLP are Twitter and Amazon.

IV. APPLICATION OF AI IN VARIOUS SECTORS

In connection to potential effectiveness, promising applications of AI in various sectors are explained as follows:

AI IN HEALTHCARE

Machine Learning/Deep Learning: Personalized Medicine, Patient record management and information Retrieval, Patient Monitoring, Drug Discovery, Infectious disease Surveillance.

Natural Language Processing: Virtual Health Assistants, Note taking and transcription.

Expert Systems: Prediction, diagnosis and treatment of medical conditions.

Computer Vision: Radio-logical and Histopathological image analysis.

Robots: Elderly care, End of life care, Robotic Surgery, Emergency Medicine.

AI IN FINANCE

Credit Card and Loan Decisions- AI systems can consider a broader set of characteristics (as compared to humans) when assessing a profile for a credit card or loan approval which reduces the cost and effort involved significantly.

Anti-Fraud System- AI-based anti-fraud systems learn on the fly and improve their efficiency to detect, report, and block a fraudulent transaction or activity.

Risk Management- AI systems provide banks and financial institutions with adaptive and intuitive tools to detect potential threats and risk exposure. AI-systems also significantly reduce human error margin

and are capable of considering a more extensive amount of data and factors to make their decisions.

Stock Market Predictions and Trading- AI systems provide a faster analysis of both structured (spreadsheets, databases) and unstructured (news, social media updates, etc.) data related to stock markets, which lead to quick decision-making. Further, AI systems can deduce predictions based on the data available to them in real-time and hence result in more beneficial financial transactions.

Sales Forecasting - AI systems can analyze a colossal amount of historical and real-time data to help you accurately forecast the sales numbers in the period of your interest, refine the understanding of the target segment and their preferences, customize product features and discount offers according to customer expectations.

Personalized Banking- AI-powered smart bots handle a majority of customer grievances today and provide the clients with efficient self-help interfaces. AI-based virtual assistants like Google Assistant, Siri, Alexa, Echo, etc. are already gaining traction in the consumer markets.

Process Automation- AI-powered systems are capable of generating reports, review documents, and extracting information from various materials like agreements, applications, etc.

AI IN MEDIA AND ENTERTAINMENT

Music- Merging technology with melody, AI-generated music leverages sophisticated algorithms to construct musical compositions. Music recommendation systems analyze user data, such as the user's listening history, music preferences, and behavior. AI is making significant strides in music production, capable of analyzing aspects like melodies and rhythms and even generating creative inputs for compositions.

Film- AI aids in the analysis of scripts destined for the screen, dissecting storylines to identify questions, uncertainties, and recommendations, simplifying and expediting the script evaluation process. AI is paving the way for enhanced efficiency in film pre-production by assisting in creating optimized schedules by analyzing and predicting task durations, suggests potential filming locations through virtual exploration, and aids in preparing for shoots by



breaking down scripts and organizing logistical elements.

Gaming- AI enriches game design by enhancing non-player characters (NPCs) and refining game mechanics through its capability to create realistic and challenging behaviors, subsequently elevating the player's experience. AI algorithms excel at delivering personalized game suggestions, considering players' preferences, gameplay styles, genre inclinations, in-game choices, and past feedback to recommend game titles aligned with their interests.

Advertising- AI enhances audience targeting by analyzing vast data, predicting behavior, and enabling real-time personalization. It segments users based on behavior, facilitates A/B testing, and optimizes campaigns for better results. AI-driven automation streamlines marketing efforts, making them more cost-efficient and customer-centric. Predictive analytics powered by AI leverages historical data to forecast consumer behavior and buying trends.

Book publishing- Artificial Intelligence aids in automating initial manuscript screening, categorizing submissions based on predefined criteria, and expediting the sorting process. Predictive modeling utilizes AI to analyze market trends and reader preferences, helping in forecasting a manuscript's market potential and guiding informed publishing decisions. AI-driven grammar and spell-checking tools swiftly identify and rectify typographical and grammatical errors, ensuring an error-free manuscript.

Content creation- From music streaming apps to OTT platforms, AI leverages machine learning to personalize both audio and visual content based on user preferences and past interactions. AI can ascertain a user's age and gender, ensuring appropriate content delivery, or it can employ automated content moderation to ensure that objectionable content is not broadcasted without appropriate audience categorization, such as for children or adults only.

AI IN TRANSPORT

Self-driving vehicles- Technology allowing vehicles to make trips without drivers got a phenomenal boost in the past decade. IoT sensors collect and transmit large volumes of data, and that data is instantly processed and aligned with other telematics and geolocation data.

Traffic management- Large volumes of data are collected via cameras, sensors, and other IoT devices and transmitted to the cloud, where AI-driven algorithms analyze the data and identify the risk of particular traffic issues before they occur. Afterwards,

actionable insights are sent to both centralized traffic management systems (e.g. for controlling traffic lights) and to individual users (e.g. route suggestions or accident notifications).

Predictive maintenance- Predictive maintenance technology powered by AI helps to predict vehicle breakdowns before they occur.

Drone taxis- A drone taxi is a stunning example of AI for transportation, probably even more exciting than self-driving cars. Drone taxis operated with the help of AI in transportation industry can substantially mitigate carbon emissions, resolve traffic congestion, and save costs on future infrastructure development and public transportation.

AI IN LOGISTICS

Demand forecasting- AI capabilities enable organizations to use real-time data in their forecasting efforts. Therefore, AI-powered demand forecasting methods reduce error rates significantly compared to traditional forecasting methods.

Supply planning- Artificial intelligence helps businesses analyze demand in real-time so that organizations update their supply planning parameters dynamically to optimize supply chain flow. With dynamic supply planning, businesses use fewer resources since dynamic planning minimizes waste.

Warehouse robots- Warehouse robots are another AI technology that help humans in picking, sorting, transporting, and stowing packages.

Damage detection / Visual Inspection- Computer vision technology enables businesses to identify damages and ensure quality control in warehouse operations. Logistics managers can determine the size and type of damage and take action to reduce further damage.

Predictive maintenance- Machine learning-powered analytics tools enhance predictive analytics and identify patterns in sensor data so that technicians can take action before the failure occurs.

Dynamic Pricing- Pricing software mostly uses machine learning algorithms to analyze customer's historical data in real-time so that it can respond to demand fluctuations faster by adjusting prices.

Route optimization - AI models help businesses to analyze existing routing and track route optimization. Route optimization uses shortest-path algorithms in graph analytics discipline to identify the most efficient route for logistics trucks.



Automating document processing- Document automation technologies can be used to increase the efficiency of processing Invoice/bill of lading/rate sheet documents by automating data input, error reconciliation, and document processing.

Automating other manual office tasks- AI systems can schedule transportation, organize pipelines for cargo, assign and manage various employees to particular stations, and track packages in the warehouse. Logistics companies can use AI tools to auto-generate regular reports that are required to inform managers and ensure everyone in the company is aligned. Based on contents in auto-generated reports, AI bots can analyze the content and send emails to relevant stakeholders.

AI IN E - COMMERCE

Recommender Systems - Providing highly personalized offers and a custom tailored online shopping journey to users via E-commerce websites.

Pricing Optimization - Create an automatic pricing system which efficiently using machine learning technology to adjust and optimize prices.

Predictive Analytics - Predict their customer's behavior; e.g. particular interest in purchasing a special kind of product, or switching to competitors for a better price.

Sentiment analysis - Monitor social media on a large scale, automatically obtaining analysis of data about what is driving traffic, engagement, and sentiments.

Chatbots & Virtual Assistants- Chatbot application can communicate and interact with customers, simulating a conversation that is human-like.

AI IN MANUFACTURING

Supply Chain Management- AI in the supply chain enables leveraging predictive analytics, optimizing inventory management, enhancing demand forecasting, and streamlining logistics. ML algorithms can analyze historical data, identify patterns, and make accurate predictions for demand fluctuations.

Factory Automation- AI-powered robots can handle intricate assembly processes, quality control inspections, and even collaborate with human workers in a seamless manner. By analyzing real-time data from sensors and equipment, machine learning algorithms can predict equipment failures and recommend proactive maintenance actions.

Warehouse Management- AI algorithms can analyze historical sales data, current stock levels, and

market trends to predict demand patterns accurately. This enables warehouses to optimize their inventory levels, reducing carrying costs while ensuring product availability. AI-powered systems can analyze incoming orders, optimize picking routes, and allocate resources efficiently.

Predictive Maintenance- By leveraging advanced analytics and machine learning algorithms, AI in the manufacturing industry enables companies to proactively monitor and predict equipment failures, minimizing downtime and optimizing maintenance schedules.

Development of New Products- AI has the ability to analyze vast amounts of data quickly and efficiently. By leveraging machine learning algorithms, manufacturers can gather insights from market trends, customer preferences, and competitor analysis. This empowers them to make data-driven decisions and design products that align with market demands.

Performance Optimization- By analyzing historical data, real-time sensor data, and other relevant variables, AI algorithms can identify patterns, detect anomalies, and make data-driven predictions. This enables manufacturers to optimize their operations, minimize downtime, and maximize overall equipment effectiveness.

Quality Assurance- With the help of the technology, manufacturers can employ computer vision algorithms to analyze images or videos of products and components. These algorithms can detect defects, anomalies, and deviations from quality standards with exceptional precision, surpassing human capabilities. ML algorithms detect patterns and trends that may indicate potential quality issues.

Streamlined Paperwork- Intelligent bots equipped with AI capabilities can extract data from documents, classify and categorize information, and enter it into the appropriate systems automatically.

Demand Prediction- AI enables companies to make data-driven decisions by analyzing historical sales data, market trends, and external factors. This helps them anticipate fluctuations in demand and adjust their production accordingly, reducing the risk of stock outs or excess inventory.



AI IN AGRICULTURE

Crop and soil monitoring - Visual sensing AI can analyze and interpret this data to track crop health, make accurate yield predictions, detect crop malnutrition much faster than humans.

Insect and plant disease detection- Using image recognition technology based on deep learning, we can now automate detection of plant diseases and pests. This works using image classification, detection, and image segmentation methods to build models that can “keep an eye” on plant health.

Livestock health monitoring - Computer vision can also count animals, detect disease, identify unusual behavior, and monitor significant activities such as giving birth. It collects data from cameras and drones .

Intelligent spraying- Computer vision is good at spotting disorders in agriculture, but it can also help with preventing them. Drones equipped with computer vision AI make it possible to automate spraying of pesticides or fertilizer uniformly across a field.

Aerial survey and imaging- AI can analyze imagery from drones and satellites to help farmers monitor crops and herds. That way they can be notified immediately if something looks amiss without having to constantly observe the fields themselves.

Produce grading and sorting- By inspecting fruit and vegetables for size, shape, color, and volume, computer vision can automate the sorting and grading process with accuracy rates and speed much higher than even a trained professional.

AI IN ENERGY AND UTILITIES

Smart grids- AI can help manage smart grids in predicting consumption patterns using historical and real-time data, which can help utilities allocate resources more efficiently. AI can also help optimise resource allocation. AI can detect faults or disruptions in the grid too, such as equipment failures or outages.

Demand response management- AI assists in creating an interactive link between energy providers and consumers by enabling real-time responses to shifts in energy demand. By predicting and managing demand fluctuations, AI can enhance energy efficiency, reduce costs and help make the shift toward renewable energy sources.

Predictive maintenance- Using AI, energy companies can predict when their equipment is likely to fail or need maintenance. Machine learning can analyse large amounts of data from various sources, such as usage stats, weather data, and historical maintenance records, to predict potential breakdowns before they occur. This approach minimises downtime, reduces repair costs, and improves the overall reliability of energy infrastructure.

Renewable energy forecasting- For sources like wind and solar, which are subject to variability, AI algorithms analyse weather forecasts, historical generation data, and real-time conditions. This enables energy providers to predict how much renewable energy will be available, allowing for better balancing of supply and demand.

Energy storage- By considering various factors such as demand, supply, price, and grid conditions, AI algorithms determine the best times to store energy, when to release it, and how much to distribute.

Carbon Capture, utilization, and storage (CCUS)- AI enhances the efficiency of CCUS processes by optimising the capture of carbon dioxide from the atmosphere or emission sources. AI-driven systems can identify the most suitable methods for utilizing captured carbon, whether for industrial processes or safe long-term storage.

Energy trading- AI processes real-time data on pricing, demand, and supply trends, enabling energy companies to make informed and profitable trading decisions. AI also excels in risk management, proactively assessing market volatility and uncertainties.

Smart homes and buildings- AI transforms homes and buildings into energy-efficient ecosystems. Smart meters and IoT devices work in harmony with AI to create intelligent, responsive ecosystems. These systems continuously monitor energy consumption in real-time, allowing AI to make data-driven decisions that optimize energy utilization.

Oil and gas exploration- By analyzing large amounts of geological data with remarkable precision, AI can identify potential oil and gas reserves that may have gone unnoticed using traditional methods. AI-driven predictive models assess various factors, including geological formations, drilling equipment



performance, and environmental conditions, to anticipate potential risks and challenges.

Nuclear power plant monitoring- AI systems are designed to maintain a vigilant watch over every aspect of plant operations, operating 24/7 without fatigue. These systems continuously analyse data from various sensors and instruments, detecting even the slightest anomalies or deviations from established safety standards.

AI IN HUMAN RESOURCE MANAGEMENT

Professional learning and development: By analyzing data on each employee, such as their skills and preferences, AI could tailor their training according to personal goals. AI could also have the potential to help HR managers identify hidden talent or identify employees ready for promotion.

Candidate sourcing and hiring: AI can help pick up the pace by helping managers nurture each potential hire automatically, and it allows them to receive notifications when a candidate applies for an open position.

Procurement of short-term workers: AI in HR can help organizations fill open positions quickly, including short-term and temp positions.

On-boarding: AI-powered chatbots can guide new employees through the onboarding process, answer questions, provide information and send reminders about key documents—reducing time-consuming tasks and enhancing the new hire experience.

Automating HR service: AI-powered HR chatbots can help empower employees with fast answers and self-service support.

AI IN EDUCATION

Automated Grading: AI can be used to grade student assessments and provide feedback. This would reduce the amount of time needed for faculty members to grade assessments and provide valuable feedback.

Personalized Learning: Artificial intelligence may be used to tailor lessons to each learner. Data collected from students' engagement with course materials may be used by AI to provide individualized curriculum.

Intelligent Tutoring Systems: AI can be used to create intelligent tutoring systems that can provide personalized and targeted instruction to students. This would allow for more efficient and effective learning experiences.

Adaptive Testing: Adaptive testing systems, made possible by AI, may modify test difficulty in response to individual students' responses. Then, examinations might be based on concepts the pupils have already mastered.

Automated Essay Scoring: AI can be used to score student essays and provide feedback. This would reduce the time needed for faculty members to read and grade essays.

Virtual Teaching Assistants: With the use of AI, we can develop digital tutors to aid students' education. These aides may help with basic queries or course materials.

V. ADVANTAGES OF ARTIFICIAL INTELLIGENCE

High Accuracy with less errors: AI machines or systems are prone to less errors and high accuracy as it takes decisions as per pre-experience or information.

High-Speed: AI systems can be of very high-speed and fast-decision making, because of that AI systems can beat a chess champion in the Chess game.

High reliability: AI machines are highly reliable and can perform the same action multiple times with high accuracy.

Useful for risky areas: AI machines can be helpful in situations such as defusing a bomb, exploring the ocean floor, where to employ a human can be risky.

Digital Assistant: AI can be very useful to provide digital assistant to the users such as AI technology is currently used by various E-commerce websites to show the products as per customer requirement.

Useful as a public utility: AI can be very useful for public utilities such as a self-driving car which can make our journey safer and hassle-free, facial recognition for security purpose, Natural language processing to communicate with the human in human-language, etc.

VI. DISADVANTAGES OF ARTIFICIAL INTELLIGENCE

High Cost: The hardware and software requirement of AI is very costly as it requires lots of maintenance to meet current world requirements.

Can't think out of the box: Even we are making smarter machines with AI, but still they cannot work out of the box, as the robot will only do that work for which they are trained, or programmed.



No feelings and emotions: AI machines can be an outstanding performer, but still it does not have the feeling so it cannot make any kind of emotional attachment with human, and may sometime be harmful for users if the proper care is not taken.

Increase dependency on machines: With the increment of technology, people are getting more dependent on devices and hence they are losing their mental capabilities.

No Original Creativity: As humans are so creative and can imagine some new ideas but still AI machines cannot beat this power of human intelligence and cannot be creative and imaginative.

VII. CONCLUSION

Artificial Intelligence (AI) has undeniably revolutionized numerous sectors, from healthcare and finance to education and transportation. The distinction between man-made intelligence and human intelligence is blurring, with machines exhibiting decision-making, learning, and even emotional processing capabilities. The categorization of AI into stages like ANI, AGI, and ASI provides a roadmap for its evolution, while the diverse domains of AI, from machine learning to robotics and natural language processing, showcase its versatility. While AI offers immense potential and advantages such as high accuracy, speed, and reliability, it also brings challenges and concerns. The high costs associated with AI implementation, the inability of machines to think creatively or emotionally, and the increasing dependency on technology are among the critical issues that society needs to address. Furthermore, ethical considerations surrounding AI, including data privacy, bias in algorithms, and the potential for misuse, necessitate careful deliberation and regulation. To harness the benefits of AI and mitigate its risks, a balanced and thoughtful approach is essential. Collaboration between technologists, policymakers, ethicists, and the broader public is crucial to ensure that AI development aligns with societal values, promotes inclusivity, and fosters sustainable progress. As AI continues to evolve and integrate further into our daily lives, proactive measures and continuous dialogue will be essential to shape a future where artificial intelligence serves as a tool for positive transformation, rather than a source of division or harm.

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