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A Study Of Artificial Intelligence And Its Applications

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Abstract: Nowadays, Artificial Intelligence (AI) is playing major role for solving complex problems in various fields like healthcare, e-commerce, education, robotics, human resources, etc. Artificial intelligence's major objective is to solve knowledge-intensive problems and develop intelligent systems that can teach themselves new things, demonstrate, explain, and give advice to their users. It can also solve knowledge-intensive tasks efficiently. The following reasons explain the importance of AI in today's world: The first reason is that anyone can create their personal assistant on their own, like Google Assistant, Siri, etc., The second reason is that it acts as a main path to create innovative solutions with other technologies. The ability to create robots that can operate in environments where human existence may be in jeopardy is the third argument. In addition to the benefits, AI is noteworthy since it may supply industries with formerly unknown insights into how they are operating and since, in various states of affairs, it can do better than citizens at specific events. AI systems typically complete tasks rapidly and with minimal errors, especially in repetitive and detail-oriented assignments, such as analyzing extensive legal documents to ensure accurate completion of crucial fields. This paper addresses the primary challenges faced by AI startups in the healthcare sector, encompassing technical depth, model explainability, management of non-clinical stakeholders, and the establishment of credibility. The central aim of this document is to provide an overview of the diverse applications of AI technology across various domains.

Keywords: Artificial Intelligence, Natural Language Processing, Feature Selection, Machine Learning and Deep Learning.

I. Introduction

The digital landscape is prompted due to the rapid evolution of technology in the world. If we talk about technological advancement and digital adoption, the past few years have exceeded expectations unlike any other time period. Individuals have the opportunity to reassess their approach to incorporating information, analyzing data, and utilizing resulting insights for enhanced decision-making with the aid of Artificial Intelligence (AI). The influence of AI extends beyond personal lives to reshape both human existence and the professional landscape. In today's rapidly evolving technological landscape, where breakthroughs emerge daily, the advent of smart machines is propelling certain fields within computer science into a phase of substantial growth, promising a new era of technical innovation. In today's world, artificial intelligence is everywhere. Self-driving cars, chess play, theorem proving, music performance, art, and many more subfields, from the general to the specialised, are among the many activities it is actively involved in. The combination of the words artificial and intelligence to make it to the word artificial intelligence, where artificial signifies somewhat created by humans and intelligent denotes a thinking object. AI is a product of mathematics, biology, sociology, psychology, computer science, statistics, and neuro-scientific study.

Significant developments in AI-based technologies across various industries, including healthcare, demand a more comprehensive knowledge of their use [1]. Artificial intelligence's major objective is to solve knowledge-intensive problems and develop intelligent systems that can teach themselves new things, demonstrate, explain, and give advice to their users. It can solve knowledge intensive tasks also efficiently. The following reasons are explaining the importance of AI in this today's world.

By employing augmented and virtual reality in medical science, systems are developed for improving health, such as telehealth and telepsychiatry, utilising extended reality in patient monitoring and senior care, and creating technology for telesurgery [2]. AI Large Language Models (LLMs) have the potential to significantly alter how healthcare is delivered. It can be designed to recognize and flag personal identifiable information or protected health information of patient, recover missing patient data. LLMs can assist doctors who are already overloaded by answering simple inquiries from patients about their health and medications. AI technology is being used in dentistry to quickly understand large amounts of data and give information that supports clinical decision-making [3]. AI has significantly impacted various facets of medical practice, including data processing, automation, computer vision, natural language processing, and machine learning [4]. Notably, the interpretation of diagnostic images, such as those generated through computed tomography (CT), magnetic resonance imaging (MRI), and X-rays (XR), has witnessed a growing prevalence in the field of radiology due to the application of AI technologies. Radiologists have been among the first professions to embrace artificial intelligence (AI) as a useful tool for medical operations [4].

The outline of this paper is that Section II is the literature survey part, which includes many of the researchers' findings and future enhancements. In Section III, we have included information about how AI is involved in various fields, with examples and advantages and disadvantages of AI technology over other recent technologies. Finally, Section IV is the conclusion part, which concludes about the main concept of artificial intelligence and its applications, and then the references are there in this paper.

II. Literature Survey

This survey mainly focused on how Artificial Intelligence is involved in various fields like education, healthcare, social media, human resource etc., In this survey, we have just started with healthcare related survey which means that how this AI technology is involving in various healthcare applications. In Figure 1, we have mentioned some of the applications of Artificial intelligence for better understanding.

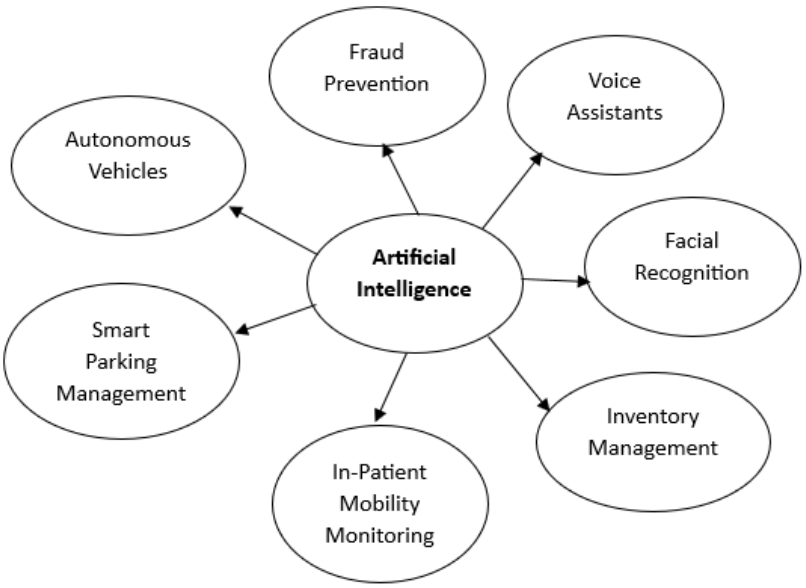

Figure 1: Applications of Artificial Intelligence

First,they were trying to focus health care filed because it is very important field as per our concern. They discussed theoretical pathways outlining how factors such as performance prospects, effort opportunities, social

influence, enabling circumstances, self-efficacy, and anxiety could influence users' intentions to adopt AI-based technologies. The study also examined the direct effects of facilitating circumstances and attitudes, both positive and negative, on the intention to use these technologies [1]. To assist the acceptance of healthcare 4.0 and its associated skills, the study concentrated on the key technologies taking into account Edge AI and Extended Reality, their functions, investigation for serviceability, and the smart healthcare systems benefits [2]. In the field of dentistry, the swift advancement of technologies such as AI holds the potential to complement or even substitute for traditional manual skills. However, it is crucial to exercise caution and employ these technologies under human supervision to mitigate errors and oversights. The early and accurate detection of oral disorders, facilitated by these technologies, contributes to improved patient outcomes [3]. The potential impact and overall trend towards using different novel technologies is energising and keeps luring investors, business owners, and data scientists to the sector [4]. In a case study centered on the higher education sector, researchers designed a Decision Support System (DSS) specifically tailored to oversee social media interactions, leveraging the capabilities of AI-based tools. The study that was undertaken showed how AI can improve student participation on social media in higher education, as well as how it can support human decision-making [5].

The natural language processing technology of AI have applied in Organizations and policymakers to assess community approaches because the market is driven by the sentiments of a consumer and social media today tenders a loyal podium for sharing facts and views[6]. AI-SocialDisaster, a decision support system, harnesses social media feeds to detect and analyze natural disasters like earthquakes, floods, and bushfires. Operating in real-time, it gathers social media communications and utilizes Natural Language Processing (NLP)-based algorithms for tasks such as entity detection, category categorization, and sentiment analysis to identify and locate various types of natural disasters. Mobile, tablet, and desktop devices, as well as Windows, iOS, and Android apps, can all be used to access the AI-based software[7].

The first of the paper's four empirical examination aims is to show a connection between individual judgements of food typicality and the confidence score of food objects provided by Google Vision AI. The second objective is to assess conflicting hypotheses regarding the types of food photographs that attract the most interaction, utilizing field data obtained from Instagram posts originating from authentic restaurants. The third aim is to replicate, within a controlled experimental setting, the findings derived from the empirical examination of field data. The ultimate goal is to demonstrate the existence of the underlying mechanism responsible for this effect [8].

The studies crafted predictive models for diagnosing depression or anxiety by leveraging social media data sourced from various platforms. Employing a mix of machine learning algorithms drawn from diverse social media platforms, among others, enhanced the predictive capabilities. The utilization of prediction models to analyze user language on social media opens avenues for identifying individuals with anxiety and depressive disorders, potentially serving as a complement to traditional screening methods. Such research also offers insights into the mental health of the public, particularly in situations where access to medical specialists might be hindered, as observed during the peak of the COVID-19 pandemic when lock-downs and temporary service closures were prevalent [9].

The goal of their work is to foresee all the more precisely the vicinity of cardiovascular disease with diminished number of characteristics. In this paper, the principlecenter is on highlight choice for Opinion mining utilizing decision tree based feature selection for cardiovascular disease (CVD). The proposed strategy is assessed utilizing National Cardiovascular Disease (NCD) data set and is contrasted and Principal Component Analysis (PCA). The exploratory results demonstrate that the proposed feature selection strategy is promising [10].

A process called feature selection (FS) aims to choose features that are more informative. For categorization or clustering, some Web opinion documents include much too many redundant and unrelated text strings. Alternatives to classification and clustering techniques that potentially solve this issue include feature selection methods. Giving excellent accuracy performance with a small feature subset is the major goal of feature selection. For text clustering for Web opinion mining, they suggested the unsupervised rough set approach in this study. They carried out more tests and benchmarked with the unsupervised method, which produces results with greater microaccuracy [11].

The integration of artificial intelligence (AI) applications in education represents a novel area for both researchers and practitioners. Existing literature reviews have not extensively examined the incorporation of AI

technology across the four primary domains of education: learning, teaching, assessment, and administration. Moreover, limited attention has been directed towards exploring the relationships between technological advancements and the learning outcomes of both students and teachers. Although the study's findings are in the early stages, they offer a comprehensive overview of how AI is being integrated into education across these key areas, considering various outcomes [12].

The writers of this publication concentrate on the field of artificial intelligence. Anything specific facets of AI should be stressed as part of a company training Business schools seem to be still important on the surface. A student enrols in a programme, selects one or more concentrations that interest them, takes classes from academic specialists, and graduates prepared for the job market and their future. Even if moving necessitates making considerable financial and personal sacrifices, employability is the main factor that influences people's decisions to move [13].

The most frequently studied variable in AI-Robots in Education Research is learning performance, in spite of of the job that the AI-robot plays. Other commonly discussed topics include attitudes, learner perspectives or perceptions of learning, and learning behaviour. In conclusion, this study provides a few commendations for AI Robots in Education research for intellectual, scientists, and decision producers in advanced education settings [14].

For both current and future residents, it is crucial to understand how artificial intelligence is used in education, how ordinary learning will change in the pandemic period, and how AI will play a part in disease outbreak learning. Learning is getting more automated, even though statistical approaches and computerized supported on learning occupations that are better than average continue to be vital. It enables people to focus more intently on their educational chances and to gain when they do not fully understand a concept. First and foremost, the teachers are a great help for assessing the results of students' learning [15]. The smart health care system and flood relief and management system have been developed using Artificial Intelligence [16,17].

III. The Applications of Artificial Intelligence in various Fields

The realm of artificial intelligence is rapidly expanding, influencing various sectors. Businesses and individuals alike leverage AI to perform repetitive tasks, analyze data, and enhance various systems. The applications of artificial intelligence in business are diverse, and survey respondents aptly noted that AI is disrupting every aspect of organizational functioning.

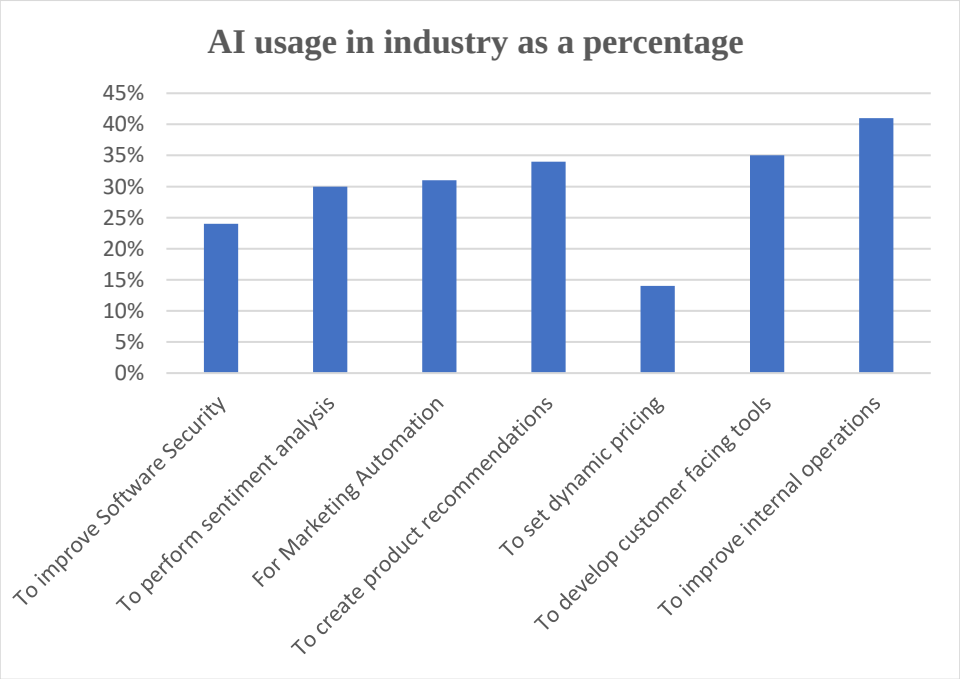

Figure 2: AI involvement in Various Functions of the Enterprise
Reference: https://dzone.com/articles/ai-survey-2018-insights-and-suggestions

Understanding the various applications of artificial intelligence in the organisation is made possible by the image above (Figure 2). Each application has a proportion connected with the use of AI in the organisation. The employ of Artificial Intelligence in Agriculture, Education, E-Commerce, Healthcare, Finance, social media are included below and then the primary example of a customer-facing tool that we have provided here is a chatbot.

a) Chatbots

ChatGPT engages users in conversational interactions to address queries and can also present opposing viewpoints. It is designed to facilitate dynamic and coherent conversations by generating responses based on the input it receives. The model is trained to understand context, generate contextually relevant responses, and adapt to diverse conversational styles and topics. However, ChatGPT is a more developed, experimental version of an earlier technology called AI chatbots. Many businesses have adopted AI-based chatbots to provide round-the-clock customer service and address urgent concerns. These chatbots leverage artificial intelligence to interact with users, answer queries, and assist with various customer service tasks, contributing to improved efficiency and accessibility. It's conceivable that chatbots' language processing will advance as AI develops more. The incorporation of chatbots into e-commerce and e-services is increasingly common, providing potential avenues to enhance customer support [18]. As outlined in a study [19], chatbot e-services facilitate dynamic and engaging interactions between brands and customers. In the realm of luxury, marketers and managers can utilize these tools to evaluate the performance of e-service agents, determining whether they meet expectations and deciding on the implementation of Chatbot virtual support [19].

b) Agriculture

Surprisingly, the field of agriculture has experienced significant growth in the utilization of AI. Computer vision and machine learning have enabled the development of applications capable of detecting soil issues and providing planting advice. AI technology has emerged as a shield for agricultural production against various threats, including population growth, climate change, employment concerns, and issues related to food security [20].

Farmers face challenges in determining the optimal time to plant seeds due to fluctuating weather patterns and increasing pollution levels. However, artificial intelligence assists in leveraging weather forecasting, allowing farmers to assess weather conditions and plan crop types and planting times accordingly. The collaboration of robotics and AI facilitates quicker and more efficient crop harvesting compared to manual labor. An AI-based software called Plantix, created by the German digital startup PEAT, can identify nutrient deficiencies in soil, detect plant diseases, and identify pests. This information guides farmers on when to apply fertilizers, thereby improving the quality of their harvest.

Additionally, drone-based systems, such as SkySquirrel Technologies, collect field data, which is then transferred to a computer for analysis by specialists. These technologies contribute to the reduction of water, pesticide, and herbicide overuse, preservation of soil fertility, efficient labor utilization, increased production, and enhanced crop quality [20].

c) Education

While human educators continue to play a dominant role in the education sector, artificial intelligence (AI) acts as a powerful tool to optimize the capabilities of instructors. AI is commonly employed to expedite automation in repetitive and data-intensive tasks, including creating or digitizing lectures and study materials, managing multiple online courses simultaneously, scheduling meetings, and evaluating homework. Emerging chatbot-like AIs are also utilized to promptly address common queries, allowing teachers to concentrate on more complex tasks. The potential benefits of AI in education encompass personalization, tutoring, grading, and feedback on course quality, among others. According to a study [21], AI has found widespread adoption and application in education, particularly by educational institutions, across various domains.

Web-based chatbots and humanoid robots are employed to execute teaching tasks independently or in collaboration with instructors. These platforms empower educators to enhance the quality of their teaching activities and efficiently handle administrative tasks such as reviewing and grading students' assignments. AI

technologies play a crucial role in supporting remote learning and teaching, offering personalized learning experiences for students, automating repetitive tasks for instructors, and facilitating adaptive assessments [22]. The relationship between students and instructors during online instruction significantly influences student satisfaction and learning outcomes.

d) Ecommerce

The e-commerce sector has experienced significant advantages through the integration of artificial intelligence (AI). Businesses leverage AI for various purposes, including trend forecasting, performance evaluation, inventory management, and more. The capabilities of AI contribute to enhancing efficiency and decision-making processes within the e-commerce industry. The ability of AI to monitor usage trends and validate data has also made it a potent weapon in the fight against online reviews and credit card fraud. AI also serves as the foundation for "recommendation engines," which present products to customers based on their browsing habits and interests. Naturally, chatbots and virtual assistants also appear here. They developed a Credit Risk (CR) model specifically tailored for the role of Risk Solution Services, establishing an industry standard for predicting customer default parameters in e-commerce risk assessment [26].

e) Healthcare

As artificial intelligence continues to advance in accuracy, its integration into the medical industry has become increasingly prevalent. Beyond administrative tasks such as data processing, meeting scheduling, file organization, and medical record transcription, AI has made remarkable strides in medical applications. Notably, AI-driven robots are now automating surgeries, offering increased precision, reduced margin for error, and less invasive procedures, often allowing for continuous operations.

Artificial intelligence also plays a crucial role in medical diagnostics by monitoring health through wearables, identifying issues before individuals are aware of them. In the field of medical imaging, AI applications assist in the interpretation of body scans, such as MRIs, facilitating quicker and more accurate detection of potential health threats. Pharmaceutical companies utilize AI to analyze historical and contemporary data for discovering new prospective treatments.

The healthcare industry has witnessed the integration of AI across various domains, from predicting outcomes using electronic health information to analyzing radiological images for early detection. The introduction of IBM's healthcare-specific Watson in 2011, focusing on natural language processing, marked a significant milestone in the application of AI in healthcare. Today, other major tech companies like Apple, Microsoft, and Amazon are also making substantial investments in AI for the healthcare sector.

The use of artificial intelligence in healthcare empowers medical professionals to make informed decisions based on more precise information, leading to time savings, cost reductions, and improved overall medical records management. Furthermore, AI applications, coupled with smart robotic systems, are creating new possibilities for enhancing the quality of life in assisted living for the elderly and disabled. Individuals with disabilities can achieve greater independence through AI, enabling them to participate in fields like informatics and innovation, as exemplified by RUDO, an "ambient intelligent system" [24].

f) Finance

The adoption of artificial intelligence (AI) in the finance sector has become increasingly widespread across various levels. Customers now leverage AI to access information related to their investment and banking accounts. Banks and credit card companies employ AI to detect changes in transaction patterns and swiftly prevent fraud. Lenders utilize AI for forecasting, assessment, and decision-making processes when determining whether to grant a loan to a specific borrower. Venture capital organizations leverage AI to generate personalized insights and make decisions related to financial risk management.

Additionally, there's a focus on joint optimization in the finance sector, as evidenced by the utilization of AI in e-commerce supply chain financing strategy and channel contract management [27]. This integration of AI enhances efficiency and decision-making capabilities within the finance industry, improving customer experiences and mitigating risks.

g) Social media

Indeed, social networking platforms have harnessed the power of artificial intelligence (AI) for various applications. Major companies like Meta (formerly Facebook) and Twitter leverage AI to analyze extensive datasets, extracting valuable insights and trends. Additionally, many businesses utilize AI to enhance their social media brand presence, implementing algorithms that can optimize content, target specific audiences, and improve overall engagement. The application of AI in social networking contributes to more personalized user experiences, content recommendations, and efficient management of large-scale data, ultimately enhancing the effectiveness and impact of social media platforms for businesses and users alike. In instance, AI may monitor comments to recommend new posts and accounts to follow, track user activity to guide marketing and advertising methods, identify current trends, and assist in creating tailored content based on demographic and behavioural data. combat harmful or unlawful material and cyberbullying Consumers also frequently employ artificial intelligence in their homes for various applications.

Even yet, there are several AI-related drawbacks that we have highlighted below along with some of its positives. Absolutely, social media has evolved beyond its initial purpose as a tool for interaction and has become a powerful platform for business development and promotion. Social media content is ubiquitous, presenting a vast amount of data that is characterized by its volume, variety, and velocity. The demand for leveraging machine learning in the analysis of social media content is growing rapidly. Machine learning algorithms play a crucial role in identifying influences and understanding the demands of individuals within the expansive and dynamic landscape of social media [25]. This application allows businesses to extract valuable insights, make informed decisions, and engage more effectively with their target audience in the ever-evolving realm of social media.

Advantages and dis-advantages of Artificial Intelligence

a) Advantages of Artificial Intelligence

High-Speed, High Reliability, Useful in Risky Areas, Digital Assistant, and Useful as a Public Utility are the Benefits. High Accuracy with Fewer Errors.

b) Disadvantages of Artificial Intelligence

As with any technology, AI technology has inherent downsides. Even while technology is incredibly helpful, there are still certain negative aspects that we must take into account when creating an AI system. AI technology has a number of disadvantages, including a high cost, an inability to think creatively, a lack of sentiment and emotion, a greater reliance on machines, and a lack of creativity.

IV. Conclusion

This paper gives a review of the application of AI in Enterprise. AI can be used for improving Software Security, to perform sentiment analysis, for Marketing Automation, to create product recommendations, to set dynamic pricing, to develop customer facing tools, to improve internal operations in Enterprise. We have included the review on other applications of AI like chatbots, Agriculture, Education, Healthcare, social media. Finally, we have concluded that, AI is playing major in various fields so it is recommended that AI should be applied to diverse sectors to provide efficient solutions with intelligence.

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