Role of Artificial Intelligence for Development of Intelligent Business Systems

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Abstract—Artificial intelligence has proven a matching technology to support multiple business system applications. This technology has been in use to reshape current business models and to provide innovative management strategies. Growing business competition among major players is also strengthening its applications. The business information system with use of artificial intelligence raises the competitiveness of enterprises in the global market. The fast pace of merging artificial intelligence and automation are propelling strategists to revise business models and to explore new possibilities to meet the customer expectations. This paper focuses on the impact of artificial intelligence on business systems. The article also presents an overview of influential academic achievements and innovations in the field of artificial intelligence and their solutions for entrepreneurial activities. In the end, we intend to discuss important points spurred around us in today's scenario about the challenges and future of artificial intelligence.

Index Terms—Business objectives, Artificial intelligence systems, Tools and techniques, Challenges and future.

I. INTRODUCTION

Artificial intelligence (AI) nowadays plays a major role in the business system as many segments are now dependent directly on this technology for bulk production and management of databases. AI dramatically improves the efficiency of our workplaces, as it can pace up the speed of production and be able to complete all tasks as effectively as humans with much more precise manners. It can help in decoding difficult patterns easily by its better analytic vision efficiency up to deeper levels and can improve product design. Also with help of AI bots, we can increase the number of hours of production without much human involvement i.e. without increasing human working hours. AI has been in use in every field from healthcare, automobiles, gaming, environmental monitoring, agriculture and sports and proven as a perfect technology for changing human lifestyle and to provide a much more comfortable life [1]–[4]. AI has been used successfully with diverse applications of various sectors such as drug discovery and development, supply chain management, etc. [5], [6].

Artificial intelligence is being used in various facets of businesses to increase profits or to accelerate manual work and thus accelerate business growth. There are many tasks in the business/industries that takes thousands of hours to complete by a human can be automated and completed by an intelligent machine. For example, one of technical giant Cognizant

developed various AI based system to improve business and revenues of the various industries [7]. Specifically, it developed a data analytics based platform for a mining company that helps in optimizing resource utilization. It reportedly save 30\$ million in the capital due to the availability of equipment. Therefore, it can be observed that AI and data science is heavily used in the current business industries.

Moreover, in recent years, advanced AI techniques have been proposed to develop hyper-automation and connectivity which can help in the beginning of a new industrial era [8]. Usually a business objective can be achieved with interdependent assignments; the group of these related tasks is termed as a business system [9]. For example a company to sell a product may define its own business system comprising marketing, sales, operation and other sections. Artificial intelligence techniques have been in use by big corporate and popular financial giants to learn and train their data and to generate prediction models from the history of data. To achieve these objectives, the Swarm and Port intelligent systems have been used to construct frameworks and algorithms to achieve optimum results [10].

From the above discussion, it is conclusive that various AI based computational technologies being used in the manufacturing industries as well as technology industries. It has been well acknowledged that AI based system can overtake or at least match human beings in a wide range of activities including emotion-recognition, product sentiment analysis, implicit judgment and automation tasks [11]. This article reviews AI and associated techniques and their applications for business systems and challenges ahead.

II. GENERAL CONCEPTS OF BUSINESS SYSTEMS AND ARTIFICIAL INTELLIGENCE

In a business system, each activity is performed and documented separately to produce results in a consistent manner. In other words, achievement of a business strategy for an organisation depends upon the business system, which is developed by connecting its circuitous and interrelated working steps. Regardless of size, shape and types, an enterprise usually comprises many standard business systems including financial, equipment, facilities, employees, operational, information service and improvement systems. In addition to these, supplier,

product and customer developments are also integral parts of a complete business system.

Business systems have been developed by defining the functionality to support multiple tasks of a business process, which also include documentation and support materials in addition to actual service assignments [12]. Any business process can be improved by implementing various processes such as mapping, analytical coverage, review and redesign implementation and acquiring new resources [13], [14]. Use of information technologies to define business models eases the process of decision making and simplifies the process of delivering the required information and hence assists in taking better decisions instantly. The informative business model covers storing the operational data, revision strategies, communicating records and documents between the processing steps. Analytical strategies have also been adapted to survey and evaluate different processes of a business system with use of information technology. If we trace the origin of the AI, it is evident that initial concepts were proposed by many renowned people and associated labs in the middle of the last century onwards. For reference, one can refer to statements from the work of Alan Turing (2015), McCarthy et al., (1955), Minsky, Slagle (1961), Buchanan and Shortliffe (1984) and others [15].

Artificial intelligence is related to computing machines, which are capable of delivering services at par with human intelligence. In the early stage of development, its concepts were applied for various applications such as; problem-solving, learning and planning activities, expert systems, machine visions, etc. With development of high performance computing devices, the use of AI has been started for other sensitive and typical applications such as; natural language processing, speech and face recognition, data mining, cyber security, etc. [16], [17]. Apart from its recent applications for security and surveillance, sports analytics and activities, the AI has proven as an effective technology for handling various segments of business systems; including the manufacturing, production, retail, shopping and fashion segments [18]. Figure 1 depicts important and recent application areas which have been using the AI concepts to achieve to their objectives.

Fig. 1. Pictorial view of some application areas of Artificial Intelligence

Based on the concept and applicable areas, AI can be classified as reactive machines, limited memory, theory of mind and self-awareness, whereas in terms of strength, it may be classified as narrow or weak, strong, and artificial super intelligence [19]. Advancement in AI is the core of enhanced performance of many other technologies present in our era and shall facilitate human-machine interactions to alter the pre existing concepts of business models. Few examples of AI that are part of our everyday lifestyles making our lives easier and smoother are route and traffic mapping to find shorter and quicker routes to our destinations, facial detection and recognition used while unlocking our gadgets etc. [20]. In recent years, AI is one of most sought and best performing and growing technology among recent ones across the globe [21].

III. SUITABILITY OF ARTIFICIAL INTELLIGENCE FOR BUSINESS SYSTEMS

In order to convert data into information, a Business informative system (BIS) comprises interrelated tasks, which works collectively for input-output processing, storage and control action [9]. BIS is useful to achieve forecasting, planning, control, coordination, decision making and operational activities for a business entity [9]. Use of artificial techniques with BIS helps to overcome its limitations such as creativity, precise decision making by incorporating innovations and intuitions. Perhaps AI can be applied with important contents of a BIS such as; operational and management information systems. Artificial Intelligence is a supportive tool in the business system rather than being a replacement for human intelligence as thought by many. It is predicted that futuristic innovative AI techniques will not only support existing business systems, but will help in developing new business areas eventually creating more job opportunities [15]. Machines with use of AI concepts and suitable software have been enabled to perform information-processing activities. For any business entity, expectations from AI solutions for various important segments are depicted in Figure 2. AI based techniques have already been in action in many segments of business systems. It is suitable for data analytics, which provides businesses with better insights of their work and if used properly can also help businesses to grow faster.

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Fig. 2. AI based solutions for various segments to create an Intelligent Business system

In the automation sector, by reducing danger exposures and the dangerous work can be done easily. It is also proven a perfect technology for language processing e.g., chat-bots [22], which make communication free of any human interference. Some important and common applications are as follows;

- Data management: transfer and reference.
- Recommendations about products and consumer behaviour forecasting to an extent.
- Chat-bots for interaction
- Advertisement and marketing
- Real-time scanning and safety measures for scams and frauds

Even the business applications of AI have increased to such an extent that it can be well said that we live, work and amuse ourselves alongside AI and through AI without even realising it. The rapid growth of marketing services nowadays is also credential to AI as it has made it possible for brands to expand their business overseas without much effort. It also makes it easier for brands to collect reviews and feedback of their product and to track the success/ failure of marketing efforts. The AI also supports customer relationship management (CRM) systems [23], and makes it easy to work with platforms, which do not require manual insertion to updates and auto correcting. Main business sectors using AI for work includes:- ,

- Education - From automating the tedious process of grading the exam results to assessing student's , their strengths

weaknesses and adapting their curricula to their needs focusing on each and every student's overall development AI has taken care of many prospects of student education in consideration and is aiming to make the future even brighter for students.

- Manufacturing - Robots are now joining humans to perform in warehouses functioning as a set of extra hands which makes the production speed faster for good.
- Financial Services - AI is making bank processes faster and accurate.

Companies are investing into AI technologies for their business operations with the aim of saving money, time, decreasing the load of work on workers, increasing production, approaching new consumers, boosting efficiency and creating new markets. There are various supporting techniques which uses AI concepts for smoothening of business processes and daily transactions in terms of finance, customers, pre and post sales activities, some of related concepts are as follows;

A. Machine learning

It is the frequently used AI technique for processing large amounts of data for businesses [24], which primarily uses algorithms to make machines learn first and then to perform in a better and quickest way. It connects devices to make use of internet of things operation by feeding data streams relevant to the business activities such as; functionality, production, sales and marketing, customer expectations and responses, etc.

In business systems, ML has also been applied for identification of patterns and anomalies by using data analytic methods. For example, a ML algorithm can identify a glitch quickly in the manufacturing process and notify the decision makers to take preventive measures. The concepts of artificial neural networks sub categorize ML into another term as 'deep learning'.

B. Deep learning

In case of nonlinear processing, a specific version of machine learning terms as 'deep learning (DL)', which relies on neural networks is better to deal with more advanced functions, such as fraud detection [25]. For example, identification, analytical decision and quick responses need to perform in parallel for self-driving vehicle operation; the DL algorithms are capable of handling these operations all together. DL algorithms are going to place more help for improving the business system operations in case of ever increasing flow of data. Another important aspect with the DL models is that they are scalable and usually independent of each other [26].

C. Challenges and futuristic AI technologies

Artificial Intelligence is adept at analysing, assessing and processing data much faster than human brain which is useful in accounting work in business systems but it still lacks the fact that it cannot alter its algorithm once it's written. If a new demand arises in the market or a new method of assessment comes into practice, AI will have to renew its algorithm from top to bottom to be able to reflect that demand. It would still

be a better option to use AI, if a new technique or method arises but looking deeper into the matter we can still make AI auto generate its own algorithm, which would make it more suitable for use as the world now is moving very fast which makes it clear that many new technologies and method will come and AI auto adjusting to it would be of a great help to all those using AI for their work. This is one thing AI based companies could aim for to make it further simpler for businesses to use. AI is now making our vision about the future come true. We used to think of driverless cars, AI made it possible to access fast graphics processing units, which made driverless cars possible.

AI has made virtual reality happen. Many new businesses are now moving forward to make virtual reality platforms possible. Virtual reality can prove to be very useful in the coming future be it in learning, drills or entertainment sector. Businesses can prosper if they invest in virtual reality as it will definitely be in demand in the coming future. AI will definitely make virtual reality possible and that is when all those investments will pay off. AI holds the potential to change the way companies work. AI is all set to bring in a new industrial revolution in the coming few decades. Experts predict that in the coming time AI may take few human jobs but will eventually create better job opportunities for us. The number of jobs created by the coming of AI in the business will far exceed the number of jobs people may lose because of it. The technology however facing lots of challenges, which has to be taken care of while developing futuristic AI based techniques, some of them are as follows;

- The technology currently is having a difficult time completing commonsense work in the real world. AI based solutions cannot automatically react to some new task, which needs alternate or innovative ways to achieve.
- One other issue AI is facing in the business environment is to merge with the ongoing projects. Once a process is started it is difficult to make changes mid way. Some AI based technologies may not face such issues as, they may not be directly related to internal process work but still there are many such solutions facing this issue.
- Also some AI based solutions expensive and requires expertise to operate, which is hard to find in the present day scenario as people are not prepared for all possible applications. Therefore development of expertise to innovate and work with futuristic AI applications will be a challenge.

IV. CONCLUSION

With this article, we have reviewed importance of Artificial intelligence and associated applications suitable for business systems. Artificial Intelligence is a boon to mankind. AI has made things easy, approachable and comfortable for us. Things that were thought of as impossible in the past are now turning into reality. Business sector are also prospering at a faster rate since AI came into business. AI is influencing business in many ways as discussed in previous paragraphs. AI based technologies are driving businesses into their intelligent

business systems era by extracting details from ever increasing amounts of data to formulate predictive models. These models help the business sector enter into a new era, a brighter era and a more prosperous era. Companies are improving their marketing techniques, understanding their customers better by the coming of AI. In collaboration with AI, the business sectors can achieve new heights and can make progress in manifolds. Implementation of AI based solutions in a business system may grow the overall business significantly, however the companies need to evaluate and understand requisite tasks for their business systems to adopt suitable AI technologies.

As per the World Economic Forum (WEF) statistics; the AI technologies shall be able to create two times the jobs than the jobs to be replaced by next year. Recent market trends actually refute the misconception that the adoption of AI will leave more people jobless. However, to achieve expected benefits, we need to overcome some challenges to create jobs, develop expertise, operators have to meet out by providing the education, training, and sometimes financial support to people as they transition from old jobs to new ones. AI could benefit business further but it may take some time due to some challenges AI faces in the present day scenario. AI is to be used for development and it can prove itself very useful for the matter if few points are to be kept in consideration. If everything goes well in the future AI will definitely help for smooth and accurate functioning of the business systems. In the very near future, with the proper use of technology we can experience a beginning of a new industrial era which shall be bound to change our future completely.

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