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Role of Artificial Intelligence and Machine Learning in Decision Making for Business Growth

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Abstract: *Necessity is the mother of invention. Artificial Intelligence is playing key role in the decision making of business growth. The paper discusses about the impacts of Artificial Intelligence and Machine Learning in the business decision making. Due to rapid change and advancement in the technology, there is impact of Artificial Intelligence and Machine Learning on businesses and global economy. Companies are using Artificial Intelligence and Machine Learning by taking more interest in their respective sector. Artificial Intelligence and Machine Learning are helping them to make their products and services more intelligent for the business growth. Literature review of Artificial Intelligence and Machine Learning related research paper is done that discussed the impact of Artificial Intelligence and Machine Learning for business growth and improvement. Various applications of Artificial Intelligence and Machine Learning in different domains are discussed. The literature review shows that Artificial Intelligence and Machine Learning have impacted human life quality and business growth. If decision makers wish to make benefits of Artificial Intelligence and Machine Learning for their businesses, they have to understand different Artificial Intelligence techniques and Machine Learning tools. They must focus on careful analysis of the risks and initial investment to avoid some common problems. It will help them to create value for their businesses.*

Keywords: Artificial Intelligence, Machine Learning, Decision Making, Business Growth, Applications

I. INTRODUCTION

In the competitive world, business needs to be sustained. For the growth of business, technology is playing a key role. Due to rapid advancements in the digital era, there is an impact of technology on different areas of business. Artificial Intelligence is one of the effective and compact technique. AI is useful for the business operations to identify the system behaviour and corresponding decision making. Machine Learning is a subset of AI used to solve the problems related to the tasks of the business. It gives ability to the machine to learn from historical data. Machine learning algorithms use historical data as input to predict new output values. It helps the organizations to identify trends in customer behaviour and business operational patterns. It also supports in the development of new products. Machine learning is used in different companies such as Facebook, Google and Uber for the prediction purpose. Machine learning is also used in our daily life in the form of Google Maps, Google assistant, Alexa, etc. [1][2].

II. REVIEW OF LITERATURE

For the present research study, few research papers, articles and web references are reviewed. The details are mentioned below regarding artificial intelligence and its applications, machine learning and its applications. Also, how AI and ML are applied in the different domains explained in detail. AI and ML applications are helping the decision makers in decision making for the growth of business is also explored in detail.

2.1 Artificial Intelligence

AI is the simulation of human intelligence processes by machines, especially computer systems. AI is used on large amount of training data to do analysis for correlations and pattern recognition. AI systems use these patterns for the predictions regarding future. AI is important for business to get insights for their operations for decision making. It has helped to explore the business for getting new opportunities. From past few years, Artificial Intelligence, Big Data, Business Intelligence and Machine Learning are most popular technologies among the web users. The Figure 1 below shows that there is more demand for Artificial Intelligence and Machine Learning by the companies. They are helping to both researchers and decision makers for effective knowledge development and decision making [1]. Companies can benefit from optimizing humans and artificial intelligence to work effectively. AI has an ability to learn and adapt to new environment and challenges. [2]

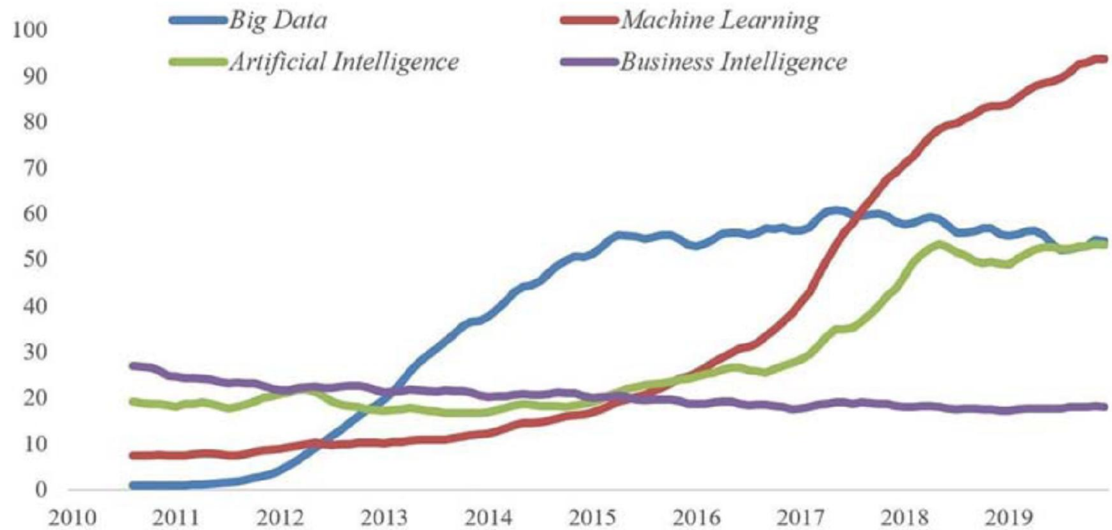

Fig. 1. Popularity of different Techniques (Source:[1])

2.2 Applications of AI

There are many areas where AI has been applied. Automation, data analytics and Natural Language Processing (NLP) are the top applications of AI used to simplify processes and increase operational efficiency. AI is used in different domains such as consumer behaviour prediction and product recommendations, fraud detection, advertising and marketing, medical diagnosis etc. Few of the top domains where AI is applied for decision making and business growth are discussed below [3][4].

1. **Sales:** Harvard Business Review study says that due to AI implementation in companies there is improvement in business by 50% and cost reduction by 60%. AI is also used for demand forecasting of the consumers. Chatbots are used to improve sales by helping the consumers to interact.
2. **Marketing:** AI is helping the business to improve their operation efficiency by increasing customer experience. It is useful to the business to get a deeper insight to target their customers. The data gathered can be used for decision making for the growth of the business. AI powered Chatbots are used to identify customer needs. It helps to get connected with the right people to provide the better service to the customers.
3. **Accounting:** AI is used to perform different tasks related to accounting. It reduces mental stress of employees so that they can focus on their other tasks. There is huge market for cloud-based payroll software. Company executives are interested to invest in advanced AI-supported payroll systems.
4. **Human Resources:** Due to Covid-19 pandemic, tremendous changes have happened. It has impacted on working environment. There is hybrid mode for working. Remote workforces are increasing in number. Due to rapid changes in new platforms and technologies, more focus is given on virtual recruiting and diversity in work environment. AI is helping HR in analyzing candidate’s work experience and skill sets. AI is helpful to the companies to analyze formal and informal relations to develop strategies for business growth.
5. **Operations:** Due to digital transformation and advanced technologies, organizations are becoming successful. AI is used for making certain processes automated so that employees are free and are able to accept challenges for higher priority projects. AI can automate cyber security and software maintenance tasks. It can also detect threats faster than humans to save the organizations from cyber-attacks. Robotics and block chain technology can be used to manage information and run the business smoothly.

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6. **Predicting Vulnerability Exploitation:** AI is used to predict malpractices that might risk the system. It is required to save the business from any malpractices. AI is also helpful to identify credit fraud and insurance claim fraud in real time. It saves the business from scams and huge losses.
7. **Social Media Insights:** In present era, social media has become one of the strongest platforms for branding and promotion of business. It provides an opportunity for the business to reach to large number of customers to showcase their products and services. With the help of AI, companies can get to know their position in the market based on the customers reviews and ratings regarding the products and services. It helps the business to know more about their customers. It helps them to plan the strategies to improve their business and build their relation with the customer through social media platform.

The figure below shows how artificial intelligence is helping to the decision makers to take the right decision in timely manner for their business growth. AI is used in decision making to enhance the features and functions of the product to achieve better performance. It is helpful in reducing human being through automation.

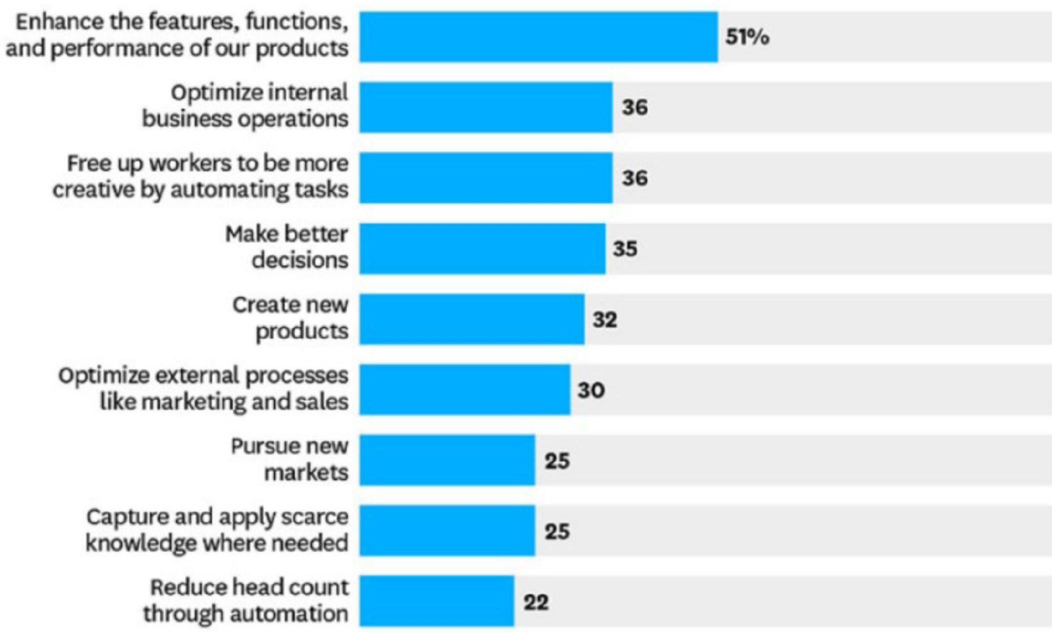

Fig. 2. Artificial Intelligence for decision making (Source:[2])

2.3 Machine Learning

Machine Learning is a process to provide the computers the ability to learn by using data and experience like a human being. Machine learning algorithms use historical data as input to predict new output values. It is used to create models that can train themselves to improve and identify different patterns to solve the new problems based on historical data. Machine learning provides enterprises the insights regarding customer behaviour, business operational patterns and also supports to develop new products [5]. Machine learning is playing key role for today's technology and business world. It is growing very rapidly day by day.

2.4 Applications of Machine Learning

A large amount of real time data is available in business. It is very difficult to get information from these large amounts of data. Decision makers need accurate data and information to take informed and right decisions for the growth of the businesses. [6]

More than 80% of the businesses adopted machine learning and AI. There is rapid rise in their returns on investment (ROI). Machine learning helps to the decision makers for right decisions in timely manner. The following are few of the top domains where machine learning is applied for decision making for business growth. [7][8]

1. **Manufacturing:** Machine learning is helpful to the businesses by restructuring inventory management and making production more efficient. Machine learning based on specific algorithm can predict failure with more than 90% accuracy. It helps the manufacturing companies to plan preventive maintenance schedules for individual items of machinery. It will help in greater production capacity and higher revenues. Machine learning also helps with supply chain management by accurately predicting customers buying behaviour regarding different types of products. It will help to the companies to manage their inventory.
2. **Efficient Logistics:** Machine learning helps to the companies to manage their logistics efficiently. Courier firms use some of the best and advanced GPS tracking systems to maximize vehicle capacity and save fuel costs. Logistic companies can plan preventive maintenance with the help of machine learning sensors attached to vehicle or vessel by reducing repair cost.
3. **Traffic Predictions:** As we use GPS navigation services, our current locations and velocities are saved at a central server for managing traffic. On the basis of this data, current traffic is predicted. Machine learning helps to estimate the regions where congestion can be found on the basis of daily experiences. Machine learning is also used to predict price for the ride when a cab is booked by the customer.
4. **Video Surveillance:** Video surveillance systems are used to detect the crimes before they happen. They track unusual behaviour of people and give an alert to human attendants. It helps to avoid mishaps and improve the surveillance services.
5. **Social Media Services:** Social media platforms are using machine learning for their own and user benefits too. For example, on the basis of continuous learning, list of Facebook users is suggested that you can become friends with. You upload a picture with your friend and Facebook recognizes that friend.
6. **Email Spam and Malware Filtering:** Various approaches are used for spam email filtering. Machine learning techniques are used for spam filtering such as Multi _Layer Perceptron and decision tree. Millions of malwares are detected daily and each piece of code is 90% to 98% similar to its earlier versions. Machine learning detects new malware with 2% to 10% variation easily and protects the system from malware.
7. **Product Recommendation:** If customers buy any product online, they keep receiving emails for shopping suggestions. Machine learning is used to predict the buying behaviour of the customers and based on the past data about the products, brands, preferences etc of the customer, the products are recommended to them.
8. **viii: Online Fraud Detection:** Machine learning is used to make cyberspace secure. Tracking online monetary frauds is one of the examples. Paypal is using machine learning to protect against money laundering.
9. **Self-Driving Cars:** Machine learning plays an important role in self-driving cars. Tesla is the example of it. It is driven by hardware manufacturer NVIDIA that is based on unsupervised learning algorithm. The model works on Deep Learning and uses internal and external sensors.

Artificial intelligence and machine learning use knowledge, confirm patterns, optimize the results and predict trends. Artificial intelligence and machine learning are used in many organizations. The below figure shows the usage of artificial intelligence and machine learning by different corporate sectors [9].

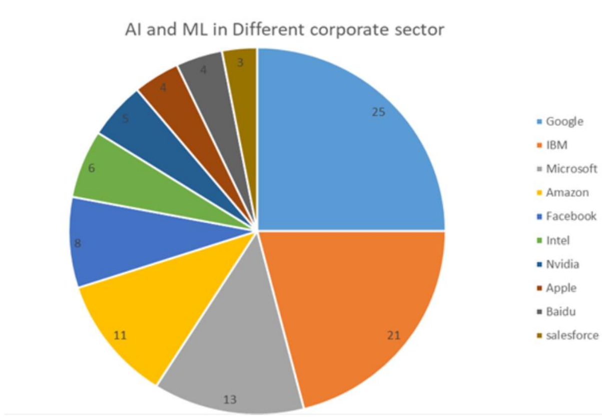

Fig. 3. AI and ML in different corporate sector (Source:[9])

III. CONCLUSION

Artificial intelligence and machine learning are used in many applications. The research paper briefs about artificial intelligence and machine learning techniques. Artificial intelligence and machine learning are helping to the decision makers for right decisions for the growth of their business. Different applications of AI and ML are discussed in detail. Uses of AI and ML in different corporate sectors are mentioned

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