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APPLICATIONS OF ARTIFICIAL INTELLIGENCE ON BUSINESS ANALYTICS

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ABSTRACT

Artificial intelligence (AI) is now pivotal in reinforcing the fabric of today's businesses. Remarkable progress has been made in recent years by integrating technology to enhance productive activities and market positioning. The paper delves deeper into the positive and negative effects of AI on various levels of society, including government, community, business, and individuals. This paper explores the far-reaching effects of artificial intelligence, from its origins in the lab all the way to its practical applications in today's society. This paper discusses the important breakthroughs in AI research that have had a bearing on business and, by extension, the global economy. The findings of the study will shed light on the innovations and the effects of AI on industries and the public at large. Furthermore, it will shed light on how AI can affect business processes and, by extension, the economy on a global scale.

1. INTRODUCTION

1.1 Definition and importance of Artificial Intelligence to business

The term "artificial intelligence" (AI) refers to the process of imbuing machines with human-like cognitive abilities like learning, problem solving, and decision making. Artificial intelligence (AI) powered machine learning (ML) technology has paved the way for AI's widespread use in business, allowing for applications in areas such as:

- Ability to read and understand written material, such as comments and ideas from users.
- Learn to identify and file away various kinds of images and visuals.
- Allow for the identification of people and the suggestion of goods using the identification of face and object attributes.

1.2 Background

Innovation has always been the primary factor in improving living conditions throughout history. However, new technologies often cause disruption when they replace the ones that came before. Cloud computing, the Internet of Things, big data, data science, artificial intelligence, and blockchain are all examples of cutting-edge technology that may benefit some people and hurt others all over the world. Even though some of these technologies had been around for at least two and a half decades (from zero to three), they were not in widespread usage or economically viable until recently. In spite of this, the use of such technologies has expanded greatly over the past few years, and they are now commonplace in practically every sector. Reasons for this include the widespread availability of free and open-source software, the increased transparency that has resulted from widespread code-sharing on platforms like GitHub, GitLab, and BitBucket, and the advances in computing technology (high-performance computing, grid, and cloud computing). The broad implementation of these technologies and the many uses they have now have an impact on all aspects of human existence. The Fourth Industrial Revolution, or Industry 4.0 for short, can be ushered in with the aid

of these technologies, allowing for the development of hyper-automation and hyper-connectivity [4]-[7].

The evolution of Industry 4.0 and the enhancement of all other technologies is primarily driven by the development of AI. There is ample evidence in the literature that indicates AI technology presents new prospects that can lead to noticeable revolution in firms and the whole economic system [4, 6, 7, 11]. Artificial intelligence (AI) has numerous useful uses in the business world, such as the quick identification of patterns in big data sets, the acceleration of data visualisation and analytics, the improvement of product design, the provision of exact insights, and many others. It is expected that the aforementioned benefits will lead to cutting-edge service standards, increased revenues, expanded businesses, and cheaper, more efficient operational models [7], [10], [11]. In this study, we analyse how AI has affected enterprises via the lens of Neo-Schumpeterian Economics.

The study's results will illuminate the contributions and consequences of AI for various sectors and the general populace. A clearer picture of how AI can alter the structure of R&D, corporate functions, and the global economy will also emerge. The findings can help nations ready themselves for the imminent arrival of AI.

2. LITERATURE REVIEW

The concept of "business analytics" is a recent one. It was first introduced as a concept with ties to economics and resource management. When it comes to running a business, "business analytics" means gathering information, analysing it, and drawing conclusions (Gupta, 2021). The discipline of mining data for actionable insights is another common definition of "business analytics" (Delen and Ram, 2018).

Using mathematical models, analytics was applied to the issue after the introduction of computers for automatic data processing in the 1960s (Delen and Ram, 2018) and time and motion studies in manufacturing in the 1950s (Delen and Ram, 2018). Analytics employ mathematical models in order to address identified issues inside an organisation (Sharma, 2016).

To solve problems and meet needs, business analytics makes use of mathematical and statistical models. The term "analytics" was coined by Simon (2017) to describe the practise of analysing raw data for insights and developing a deeper comprehension of a subject or event.

Business analytics provides answers to questions of importance to a company about its business, while report generation only visualises the behaviour of one or more variables. This distinction is made repeatedly in the literature (Simon, 2017).

According to Muoz-Hernández et al. (2016), businesses can gain an edge in the market by making better use of the data at their disposal through the application of business analytics. Evans and Lindner (2012) are among the writers who believe it is crucial for decision making.

As a result, Zumstein et al. (2022) emphasise the enhanced maturity, benefits, difficulties, and development of enterprises and economies as a result of the application of artificial intelligence.

In a similar vein, authors like Shi et al. (2022) point out that firms are using business analytics (BA) to boost consumer engagement due to the abundance of data and the limitations of digital products. Their primary findings show that BA culture cannot boost performance unilaterally but must work in tandem with other strengths in the organisation. Furthermore, the growing body of literature on the topic demonstrates that BA procedures mediate the interaction between customers and innovation by enabling businesses to make greater use of the wealth of internet data.

According to Silva et al. (2021), "Industry 4.0" has come to characterise diverse implementations of ICT in manufacturing processes. As a result, business analytics (BA) is now recognised as a significant development in IT that improves the quality of business decisions (Namvar et al., 2021). That's why business analytics is so important; it streamlines data analysis and connects it to cutting-edge innovation, which in turn revolutionises how businesses make decisions (Ward et al., 2014).

The intersection of AI and business analytics can be viewed from a number of angles. Aside from data visualisation and statistical modelling, AI is one of the three pillars of business analytics (Raghupathi and Raghupathi, 2021). The most popular type of AI used to back up this pillar of corporate analytics is machine learning. Insights can be gained from corporate data with the use of machine learning's tools and approaches. In the context of business analytics, AI is also seen as the next logical step after traditional analytics, and this new era is referred to as "analytics 4.0." (Davenport, 2018). As well, other authors have suggested that AI is frequently used to help business analytics translate data into information (Schmitt, 2022).

AI is a cutting-edge and (often) game-changing technology that can revolutionise company operations (Wamba-Taguimdje et al., 2020). Every single one of a company's procedures is designed to yield some sort of valued end product, and the advent of cutting-edge technologies has raised expectations for dramatic enhancements to these procedures. Artificial intelligence (AI) is no different; it can aid in the reimagining of corporate procedures that aim to radically shift the status quo (Mishra &Pani, 2020).

3. METHODS AND EXPERIMENTAL DESIGN

In order to get a company ready for the implementation of automated systems, it is crucial to use cutting-edge methods and cutting-edge technology, such as business intelligence and artificial intelligence. In the modern era of the internet, these cutting-edge tools are indispensable for design, invention, advertising, soft promotion, marketing, and sales because of their near-perfect compatibility with the platform business model. Over time, both AI and data intelligence tools have improved. The expanding meanings of ideas like design, creativity, opinion, cognition, belief, and appreciation are all thanks to the exponential development of AI and cloud computing. Consequently, the potential for extension of AI business models grows as more data and business information are accumulated.

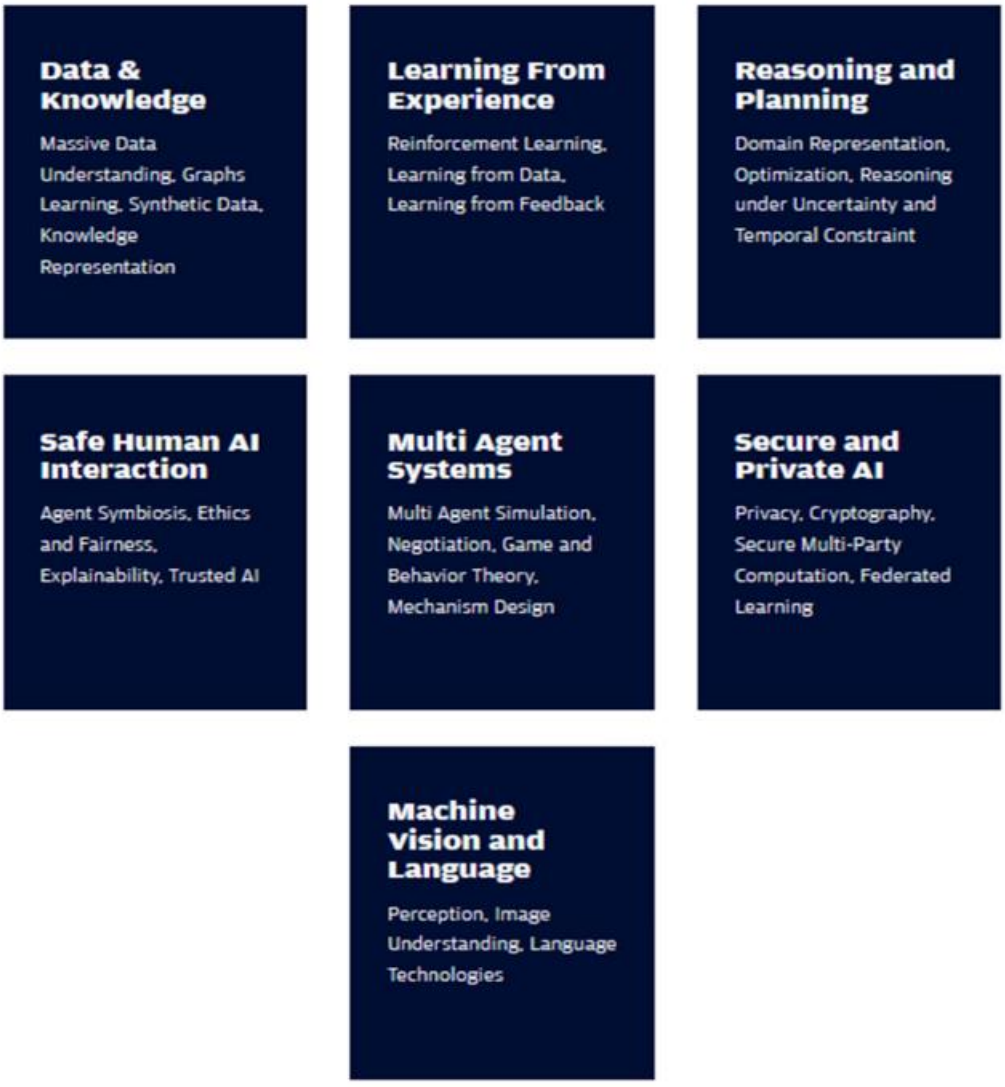

Fig. 1 Artificial intelligence nucleus in business domain

Modern businesses use AI and data intelligence to grow. Recovering the costs of the services and cutting-edge innovations for which a business pays requires a significant amount of effort, and this is where data intelligence (DI) comes in. Recognizing consumer preferences is one of the most common applications of data intelligence. Statistics on consumers' habits, shopping preferences, purchasing behaviours, price tagging preferences, colour preferences, style preferences, and online trends can be mined using data mining techniques so that businesses can better serve their target customers and gain a deeper understanding of their interests. The organisational structure of data intelligence is depicted in the diagram below (Fig. 2).

Fig. 2 Design of data intelligence in business ecosystem

Artificial intelligence (AI) has reached a point where it can be utilised to alter business practises and the global economy. The integration of 4G LTE and 5G-enabled communication channels has had a significant impact on the company's ethos. In recent decades, AI and ML algorithms have become prevalent in the business world, giving a knowledge-based portfolio for new businesses and delivering solutions to a wide range of cutting-edge corporate applications. Artificial intelligence (AI) has helped various businesses in a variety of ways, including cutting costs, improving output, coordinating technological progress, and automatically adopting improvements. Globally, business process engineering is being applied at all levels of management these days. Managing the costs and benefits of digital transformation in new ventures is a difficult task that nearly all CEOs must face today. This influence is shaping the way businesses operate and the existing competitive business landscape. Managers' levels of excitement for taking on this challenge are wide. With the help of business technology measurements, it is possible to quantify and discuss progress toward acquiring AI skills. Recognizing this shift, the risk group included a discussion on AI's implications for enterprise in their latest risk roundup.

3.1 Innovations in AI business model

The realm of artificial intelligence (AI) is gradually expanding to include corporate settings. Millions of sectors and companies throughout the world are harnessing the potential of AI and Applied AI (AAI). Many companies now use machine learning algorithms to detect fraud within microseconds, hence boosting trust and loyalty among their clientele. New machine learning tools, commercial platforms, and application-based solutions have evolved to meet the demands of enterprises.

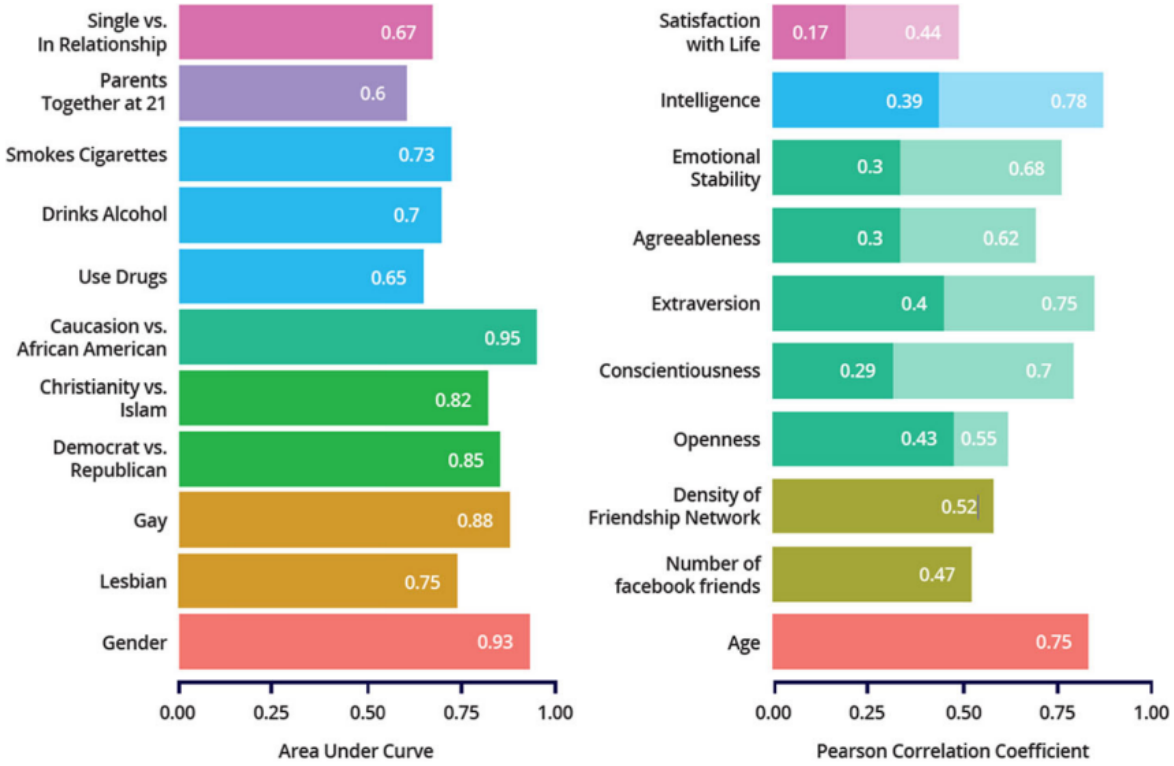

Fig. 3 Private traits and attributes using AI and machine learning models from digital records of human behavior.

The internet, software, construction, medicine, law, and even cars and agriculture have all benefited from the compression of quality brought about by these cutting-edge technology.

3.2 3 Major Applications of Artificial Intelligence in Business

Here are the three most important uses of AI in business, despite the fact that AI is employed in many more areas of today's corporations.

- **Work Automation**

More than 9 million manufacturing jobs in the United States could be lost due to AI-driven work automation. Artificial intelligence (AI) is being used by manufacturers to optimise their usage of resources. For instance, GE is using information gathered from AI-powered smart sensors put on its manufacturing equipment to cut down on machine downtime.

Artificial intelligence (AI) and the Internet of Things (IoT) are enabling businesses to boost efficiency, cut expenses, and develop new niches in the labour market.

- **Sales and Marketing**

Artificial intelligence is playing an increasingly important role in marketing and sales, which is causing widespread changes in this field. The use of AI is enabling marketers to automate a variety of menial jobs by making better use of available data, so freeing them up to focus on more important matters, such as growing their client base and enhancing the quality of their services.

Use the "Marketing Channel Performance Report" to monitor your most fruitful promotional avenues.

For example, Facebook makes use of ML algorithms to track user behaviour in order to provide targeted online adverts. Online lodging marketplace Airbnb is utilising AI to calculate the most profitable rates for rooms in any given area, taking into consideration the total number of potential guests.

- **Customer Service**

A third of all online purchases are made from a mobile device, according to estimates from the retail sector. With the proliferation of smartphones, more and more people are turning to apps for everything from games to news to shopping to banking. A growing number of companies are putting their faith in chatbots driven by artificial intelligence to handle their customer care needs. Some airlines, like Royal Dutch Airlines, let passengers check in and receive flight updates using Facebook apps. About 20 billion messages are traded monthly between businesses and customers via

Facebook Messenger, where over 300,000 bots are now active.

4. RESULTS AND DISCUSSION

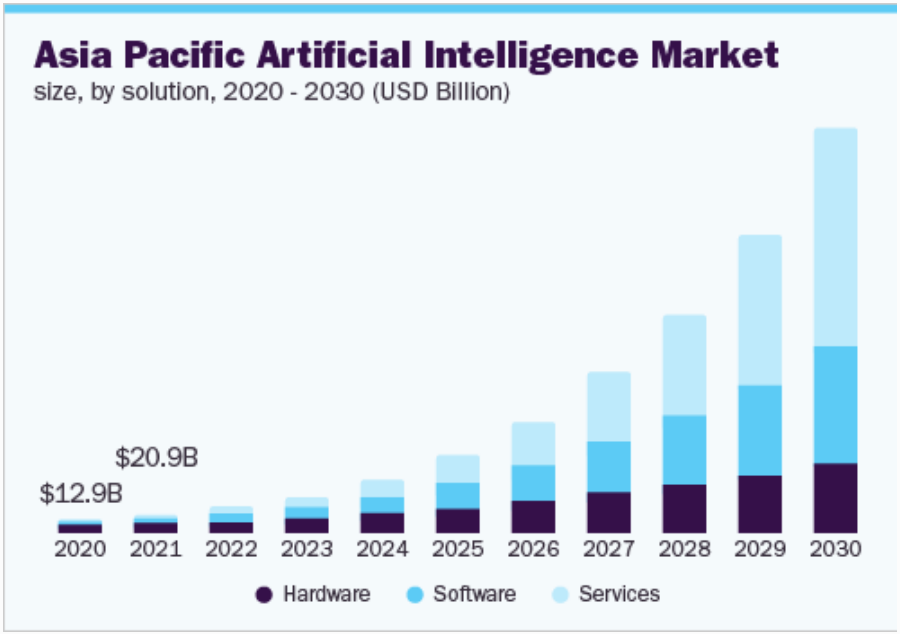

Fig 4: Global artificial intelligence market size

Figure 4 depicts the current and forecast value of the worldwide artificial intelligence market, which is expected to increase from its current value of $93.5 billion in 2021 at a CAGR (compound annual growth rate) of 38.1% between the years of 2022 and 2030. Industry verticals including automotive, healthcare, retail, finance, and manufacturing are leading the way in adopting cutting-edge technology thanks to the persistent research and development efforts of the IT giants in these areas. Cnvrg.io., an Israeli company that makes a platform for data scientists to develop and run machine learning models, was acquired by Intel in 2020 as part of the company's plans to grow into the artificial intelligence (AI) market.

End-use Insights

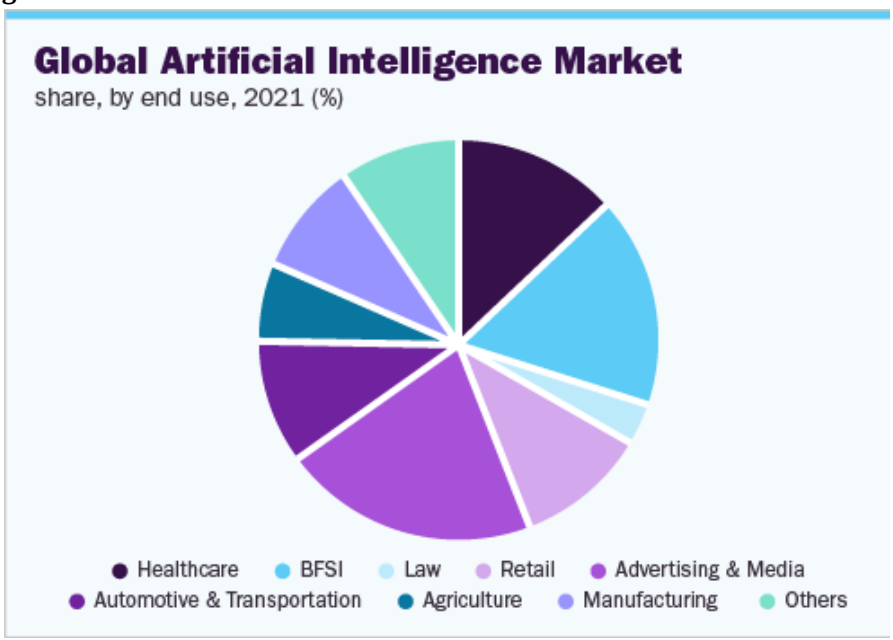

Fig 5: the growing AI marketing applications with significant traction.

More than 20.0% of total market revenue was generated from the advertising and media sector in 2021. Figure 5 displays the growing share attributed to AI marketing applications that are gaining substantial traction. In January of 2022, for example, Cadbury launched a programme that allows small company owners to make their own advertisement with the help of an artificial intelligence tool, utilising the likeness and voice of a superstar. On the other hand, by 2030, the healthcare industry is expected to have the largest market share. Use-cases include clinical trial participant identity, hospital workflow management, preliminary diagnosis, automated image diagnosis, and robot-assisted surgery are just a few examples of how the healthcare market has been broken down. Services like financial analysis, risk evaluation, and investment/portfolio management are all part of the BFSI industry. High need for risk and compliance applications has led to artificial intelligence gaining substantial traction in the BFSI.

Table 1: Artificial Intelligence Market Report Scope

Report Attribute	Details
Market size value in 2022	USD 136.6 billion
Revenue forecast in 2030	USD 1,811.8 billion
Growth rate	CAGR of 38.1% from 2022 to 2030
Base year for estimation	2021
Historical data	2017 - 2020
Forecast period	2022 - 2030
Quantitative units	Revenue in USD billion and CAGR from 2022 to 2030
Report coverage	Revenue forecast, company ranking, competitive landscape, growth factors, and trends
Segments covered	Solution, technology, end use, region
Regional scope	North America; Europe; Asia Pacific; South America; MEA
Country scope	U.S.; Canada; Mexico; Germany; U.K.; China; Japan; India; Brazil
Key companies profiled	Advanced Micro Devices; AiCure; Arm Limited; Atomwise, Inc.; Ayasdi AI LLC; Baidu, Inc.; Clarifai, Inc; Cyrcadia Health; Enlitic, Inc.; Google LLC; H2O.ai.; HyperVerge, Inc.; International Business Machines Corporation; IBM Watson Health; Intel Corporation; Iris.ai AS.; Lifegraph; Microsoft; NVIDIA Corporation; Sensely, Inc.; Zebra Medical Vision, Inc.
Customization scope	Free report customization (equivalent up to 8 analysts working days) with purchase. Addition or alteration to country, regional, and segment scope.
Pricing and purchase options	Avail customized purchase options to meet your exact research needs. Explore purchase options

Increasing their customer base is a top priority for market vendors, as seen in Table 1. For this reason, major players are engaging in a variety of strategic moves, including mergers, acquisitions, and collaborations.

CONCLUSION

This article discusses the increasing role that AI plays in a variety of business processes, such as data analytics and competitive intelligence. An summary of the state of business analytics research is also provided in this paper. Our research shows that business analytics is a rapidly developing area that is gaining scholarly interest from all around the world. Scholars and businesses need to work together to find the best practises in business analytics that are effective for businesses if this field is to continue to grow and have an even greater impact in the sector. More study might also be devoted to the intersection of AI&A and control in an effort to pin down the nature of control in AI systems, the ways in which the roles of controller and controlee may shift as AIs learn and evolve, and related questions. As a final point, while the studies in this special issue focused on the telecom, high tech, and manufacturing sectors, it would be very interesting to see similar studies conducted on companies in other sectors, such as retail, financial services, banking, and healthcare.

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