

Saudi Arabia Corporate Firms are Hesitant to Embrace Artificial Intelligence as of 2020 Despite the Numerous Benefits

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Abstract:- The modern world has experienced numerous advancements, particularly in the Artificial Intelligence (AI) sector which is slowly shaping the mode of business in Saudi Arabia. This research paper focuses on why there has been hesitation in the establishment of AI in Saudi Arabia firms despite the numerous potential advantages of AI. Saudi Arabia has, in recent times, undergone diversification in its economy. Its AI is experienced in the sectors such as robotics, industry, finance, and banking, especially in forecasting and improvement of business processes alongside provisions of solutions to complicated functionalities. However, AI is halfway implemented in the country due to various constraints explored in this publication. This research article examines companies hesitant to invest in AI and elaborates on its deployment in companies in Saudi Arabia to utilize such technologies in entire sectors. Moreover, our research also analyzes the total investment associated with AI to realize the desired change in the organizational operating activities. Our primary research involved over 2000 senior executives regarding the adoption of AI, the firm's prospects for deployment, and its effects on the markets, governments, and persons. The results of this study showcase that the new AI generation is primarily based on the digitalization platform. Lastly, it is noted that AI deployment and acquisitions require a large number of funds hence forcing struggling firms to evade its adoption.

Keywords: - AI, Robotics, regulations, human intelligence, Algorithm, research

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1 Introduction

Artificial intelligence is defined as systems or machines that utilize human intelligence to perform functions and improve themselves through the data they collect, [10]. [14] defines Artificial intelligence as the adoption of computers to carry out functions that necessitate the use of human analytical skills. The McKinsey Global Institute has explored that artificial intelligence is expected to bring out the next digital disruption wave and anticipates that companies across the globe ought to start embracing it rather than running away. Most companies in New York that have fully embraced Artificial intelligence have experienced actual merits hence generating an urgent urge for other companies to adopt digital transformations, [6]. This research concentrates on five Artificial intelligence technology functionalities, including; computer vision, language virtual agents, machine learning, robotics, and autonomous automobiles, including vehicles

Artificial intelligence is a field that has experienced robust and rapid growth. Currently, the growth is dominated by the large digital giants, including Google and Baidu, which incurred over \$20 billion in Artificial intelligence as of 2016. Research and development and deployment incurred 90 percent of this expenditure, while the other 10 percent was spent on acquisitions. Saudi Arabian companies are hesitant to embrace artificial intelligence despite the numerous benefits witnessed in other developed nations across the globe. There exist several constraints that have continuously hindered the utilization of artificial intelligence. Some of these constraints include; financial constraints, government regulations, and social constraints, among others. However, a full implementation is expected to see Saudi Arabia gain \$ 135.2 billion by 2030 in the country's economy, representing 12.4 percent of the gross domestic product (GDP). It is also expected that Saudi Arabia's economy will grow by 20-34 percent due to the full implementation of Artificial intelligence.

This paper explores why Saudi Arabia companies are hesitant to embrace artificial intelligence.

The roles of Artificial intelligence may be classified into two categories: how it is used to represent opportunities and how it could be misused or overused.

How artificial intelligence can be used(opportunities)

1. Enabling human self-realization
2. Enhancing human agency
3. Increasing societal capabilities
4. Cultivating societal cohesion
5. Demerits of Artificial intelligence (Threats):
 - a) devaluing human skills
 - b) removing the person's responsibility
 - c) reducing human control
 - d) eroding human self-determination

2 Literature Review

[14] suggests the existence of three classes of artificial intelligence including; artificial narrow intelligence (ANI), artificial general intelligence (AGI), and Artificial superintelligence (ASI). He suggests that the ANI consists of technologies made for only particular and limited functions. For example, the Algorithm behind the Google translate Anti-lock brake systems as well as facial recognition technology. According to [14] the AGI has the capabilities of Ricki operating in the entire area including the cognitive function of the human brain capabilities. However, this artificial intelligence is yet to be realized. In the last level, ASI has exhibited numerous challenges and would take several decades to attain them. It is seen to exceed human brain capabilities. According to [14], the world stands to gain enormously from artificial intelligence developments. The world is currently crumbling with global issues such as overpopulation, environmental challenges, and health alongside inequality. Artificial intelligence can assist gather information necessary to monitor climate change as well as predict pollution while assisting doctors and the medical fraternity diagnoses diseases such as skin cancer.

[14] also suggests that there are security and risk concerns that artificial intelligence can bring about when fully implemented. The malicious utilization of artificial intelligence is the main borne of contentious, especially in the Arab Gulf Countries. Moreover, a review of the breakthroughs attained by the countries that have embraced it reveals massive

job destruction as well as displacement of human resources. Furthermore, the security concerns are also analyzed through a major emphasis on autonomous weapons systems as well as their effects on strategic stability. Another critical aspect is that cyber artificial intelligence is likely to offer support on the offensive operations alongside the manipulations largely seen as a major setback to artificial intelligence.

[13] suggest that Saudi Arabia has continued to lag behind developed nations across the globe despite providing the best health services to its citizens. There are few innovations in sectors such as real projects road maps as well as clear policies to guide the implementation of the Internet of Things alongside the big data adoption in the country. The study suggested the algorithms explored might be utilized in the prediction of diseases and classification but are not adequately satisfactory. Consequently, there is a need for more training data alongside a larger duration required. The application of the Internet of Things (IoT) as well as big data technologies would play a huge role in the prediction of chronic diseases as well as on a larger scale. [8] suggests that Saudi Arabia is currently undertaking the largest and longest economic reform as well as transformative program in its history. The major area through some hesitance is highly witnessed is digitalization alongside the artificial intelligence that forms the key aspects regarding the wide range of reforms. [8] explains the Saudi Arabian government is working to ensure promote the digital capabilities of the workforce to par with Artificial intelligence as well as other technologies such as the internet of things. This task requires educational reforms measures to ensure that the students get the digital skills necessary for future careers. This suggests that the major embedment in the implementation of artificial intelligence is the lack of education amongst the stakeholders.

[8] suggests that all countries across the globe have embraced the use of technology to achieve their development agendas. The country's vision 2030 programs are mandated to achieve efficiencies in governments through enhanced automation that must embrace digitalization. For instance, in the government agenda to sustain smart cities, it is crucial that systems, as well as services, would revolve around artificial intelligence alongside the Internet of Things, [7]. [8] stated that researchers are not only embracing Artificial intelligence but also

exploring its usability in an innovative, ethical alongside responsible manner as they seek to attain the vision 2030 agendas and objectives. Moreover, embracing Artificial intelligence is fundamental in bettering the citizens' services such as education, and health alongside other services. The proposed mega intelligent city, Neom, which is a \$ 500 billion investment would entirely depend on Artificial intelligence, big data, and the Internet of Things. Consequently, the government and companies across the nation have a fundamental duty to embrace Artificial intelligence.

The biggest predicament is the risks as well as opportunities associated with Artificial intelligence. The government and Saudi Arabian companies need the right ecosystem and design effective as well as appropriate policies. The other challenge is to develop digital skills among its human resource. Human labor needs to be conversant in the areas to do with data science, Artificial intelligence, and cyber security. [11] suggests that artificial intelligence is used to reciprocate the nature humans see as well as react to the world. Consequently, it has become a cornerstone of innovation activities. [11] suggests that Artificial intelligence can create more value for their business through the provision and understanding of presented data. It also depends on the predictions necessary to automate excessively difficult and challenging tasks.

3 Problem Formulation

What are the issues facing the adoption of artificial intelligence (AI) in Saudi Arabia? What are the Issues affecting the laxity of adoption of AI by business owners and the government's role in the implementation of laws and regulations on artificial intelligence?

4 Methodology

The methodology adopted comprised four modules including data collection techniques, data storage, and lastly the Google Cloud. The collection of primary data was performed through the use of interviews with the senior executives of the respective companies operating in Saudi Arabia. The basis of the questions was defined as whether the company had adopted the use of artificial intelligence before and further required whether the information

would be applied in the future where the intelligence had not been used. The interviews were to be responded to in a way that pointed out the challenges and setbacks they face in the implementation of artificial intelligence in the workplace. The research employed a sample study of approximately 500 executives who were operating in leading companies in Saudi Arabia.

In addition to the interview, the study also analyzed the secondary sources on the same. These included journals, publications, and articles based on artificial intelligence and the internet of things. The research was based on those which were focused on Saudi Arabia as well as podcast videos dealing with the same.

5 Results

Results show that most companies in Saudi Arabia are hesitant to embrace Artificial intelligence. The 500 senior executives in large corporations stated that education levels, large capital outlays required, and inadequate policies in place were the major impediment to embracing it. The research shows that Saudi Arabia was slowly embracing artificial intelligence in a bid to attain a digitalization program by 2030.

75 percent of the participants agree that artificial intelligence played a significant role in developed countries by bettering the nation's economy. The large business corporations were in the early stages of adopting the innovative technology but the relatively smaller firms were hesitant to embrace it. The large firms contributed to the highest rates of adoption as well as artificial intelligence awareness.

Table 1. The senior executive responses on the inability to adopt artificial intelligence

Factors	Executives			
	Small firms		Large firms	
	YES	NO	YES	NO
lack of Education and Training	75%	25%	76%	24%
Financial Constraints	88%	12%	55%	45%
Regulatory constraints	47%	53%	49%	51%
conservative organization management	33%	67%	45%	55%
Technical challenges	50%	50%	62%	38%
Risk Exposures	76%	24%	74%	26%

Although the smaller firms are hesitant to embrace Artificial, the study finds success stories, particularly in these firms. Compared to large corporations, these firms are likely to benefit since they experience very few issues regarding the legacy IT systems alongside the less likely to resist organizational change. Consequently, smaller firms need to embrace Artificial intelligence which is provided as a service to better an organization's economic growth and productivity levels.

69 percent of the participants agree that the initial artificial intelligence implementers usually attain the class of serial adapters. The study suggests that companies that had adopted Artificial intelligence at the early stages continuously keep on looking for multiple Artificial intelligence tools the moment they start adopting. The high-tech companies in Saudi Arabia are reported as having the largest adoption rates in the country while the construction firms had the least rates. 76 percent of participants revealed that the majority of the corporations in Saudi Arabia are hesitant to adopt artificial intelligence due to Education and healthcare levels. Most participants agree that firms must examine the level of preparedness of the human resource in the organization. The government and corporations ought to take a keen interest in ensuring that all the staff members clearly understood the artificial intelligence tools to reduce exposure to risks. The anomalies noted in the education and health sectors bring about slowness as the firms tend to adopt Artificial intelligence.

The participants explained that most users are unable to adapt and adopt. The senior executives

mostly drawn from the IT sector allude that the industry is expected to experience robust growth in the preceding three years. The Saudi Arabia firms despite their hesitance are expected to grow their expenditure on artificial intelligence-related tools. However, the rate at which the firms would increase their expenditures is highly debatable as no constant figure. The firm's financial muscles will be the determining factor. Some are expected to grow by more than 10 percent representing 20 percent of the firms in the Saudi Arabia business market, [3]. The participants concurred that the technical challenges are a major obstacle in the implementation of Artificial intelligence. Engineering solutions should be carried out on particular utilize cases that need the data as well as talent. The executives agreed that some firms such as financial institutions have continued to create alongside storing voluminous structured data while others particularly the construction and transportation are left behind.

The participants also stated that the commercial drivers are different between sectors. The firms with the most complex and sophisticated procedures especially in their operational and geographical aspects have taken lead in the adoption of artificial intelligence. It is because their performance is pegged on active forecasting, speedy as well as accuracy in decision making with personalized customer linkages, [18]. The participants alluded that despite the numerous demands of artificial intelligence by the firms, other barriers such as regulatory alongside social obstacles exist. Majority of the Saudi Arabia firms are willing to invest in artificial intelligence tools to better their firm growth rates. Such results in product liability which is a contentious aspect that manufacturers and automakers perceive as problematic. The firms are hesitant to embrace it due to privacy issues that prohibit data accessibility. The firms are required to anonymize the data before being used for research purposes. At this stage, some crucial information might not be revealed hence firms might put many considerations before embracing artificial intelligence. Moreover, ethical issues including the trained baseness as well as the algorithmic transparency are still borne or contentious without any reprieve derived for them, [13], [14], [15].

The Secondary sources suggest that firms categorized as digital native firms with large Artificial intelligence investments exhibit a higher return on investments. For instance, Amazon has

over the years attained positive results due to the Kiva acquisition at \$775 million. Kiva is a robotics company that automates picking as well as packing. Consequently, there has been an increase in inventory capacity as a result while the operating costs reduced by at least 20 percent hence an increase in the return on initial investments. Adoption of the artificial intelligence is exposed to numerous manipulations. 53 percent of the participants allude artificial intelligence would be subject to various manipulations ranging from forgery of images, films, and voices. The adoption by Saudi Arabia firms and individuals in an inappropriate manner would jeopardize the Gulf region as well as create instances of instability. Artificial intelligence adopted by firms in Saudi Arabia would increase the vulnerability scope while exhibiting some potential issues and malicious utilization of Artificial intelligence alongside other emerging technologies, [1].

Table 1 illustrates concurs with the study results that the adoption of artificial intelligence would continue to increase across the globe. Firms need to lower their operational costs, grow the significance of big data in healthcare as well as raise the adoption of precision medicine, [4]. It is not in healthcare where artificial intelligence is adopted but other sectors also follow the same path globally. Figure 2 below describes the various dimensions of artificial intelligence as follows; thinking humanly, thinking rationally, acting humanly, and acting rationally, [11], [12].

According to the data presented in Figure 1, there is a significant growth in the rate by which artificial intelligence has been used in the healthcare market for the projections made from 2014-2025. The

incorporation of hardware, software solutions, and services has also remained steady through the past years and the same projection is expected to grow up to 2025. The significant growth in the level of usage of artificial intelligence shows a significant rate of acceptance which makes the solutions offered to be deemed as overall useful in the development and improvement of the services delivered by the United States healthcare sector.

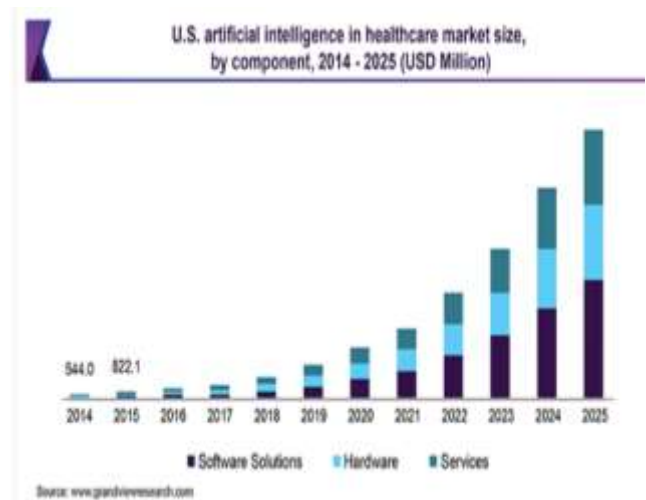


Fig. 1: Adoption of Artificial intelligence in the United States.

Source:

<https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-healthcare-market>

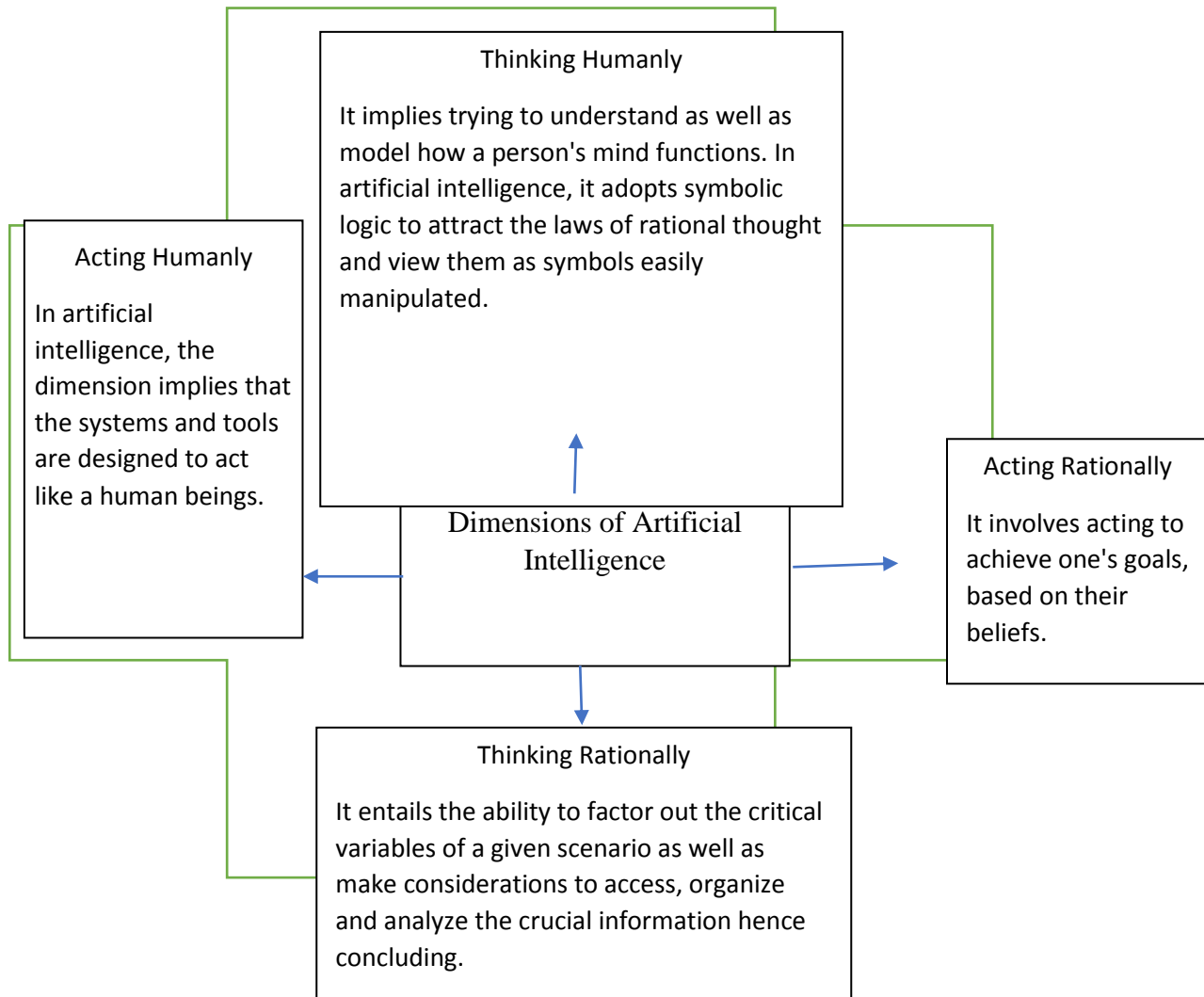


Fig. 2: Artificial Intelligence framework

Figure 2 provides an analysis of the artificial intelligence framework and the dimensions involved. Technically, from the results, there are four major frameworks or dimensions which revolve around artificial intelligence. Thinking humanly involves adjusting the projections to make sure that the results are in line with human thinking. Acting humanly requires that the systems should be able to deliver on their roles just as human beings would but in a more improved manner. Thinking rationally incorporates the intellectual perspective

to be able to sort out some critical areas which might need improvement. Lastly, acting rationally involves the implementation phase where the intervention by the AI comes into play.

6 Discussion

From the results, it was evident that there is a need for an administrative integration of businesses for them to adopt AI systems. The results showed that most businesses do not have a preoperative strategy that will make sure that all the inclusions of AI will be in line with the ethical values of the company. There also are many laws by the Saudi Arabia government governing businesses that limit the scope and extent to which such companies can make decisions, especially those that go against sharia law or might need some explanation. For example, there

are significant AI adoption guidelines that are written with different procedures as well as recommendations that assist in the governing of the systems. There arise ethical issues where data collection comes into play and when there is subsequent decision processing of the behavior as depicted by an entity. However, through the use of the ABV lenses, there is an advancement of the empirical investigation which helps the organization in terms of their abilities to deal with any challenges they might face when using AI, especially in crucial sectors such as the public sector which is critically analyzed to avoid any violation of set laws.

7 Recommendations

Firms are embracing Artificial intelligence to replace the human workforce via automation. However, it is adopted to complement the teams of people. For instance, in the United Kingdom, an online supermarket describes the scenario through which the company embeds Artificial intelligence and the utilization of robots in most of the companies operating activities. Consequently, Saudi Arabia corporations need to adopt artificial intelligence without much delay hence acquiring the benefits derived therein, [16], [17]. There are numerous advancements generated through collaboration alongside context-aware robots. Artificial intelligence is crucial in crafting new algorithmic models while enhancing the training of the data sets. The primary predicament in the adoption of Artificial intelligence is poor education. Therefore, the government and corporations in Saudi Arabia need to promote training needs for human resources, [9]. Such would reduce the people and cyber security risks exposures as firms seek to adopt.

The Saudi Arabia government should eradicate the regulatory and legal barriers. Most players in the sector venture into Artificial intelligence since there are no predicaments in the regulatory systems. Saudi Arabia seeks to implement a digitalization program by 2030; hence it should promote artificial intelligence tools. The employees should adapt their skills in offering support alongside complementing the artificial intelligence user experience. For instance, the teaching sector's lectures should change to undertaking less lecturing while embracing tutoring and coaching, [9]. The sales and call centers in the corporate world need to embrace virtual. At the same time, human resources should tune their

emotional intelligence skills to offer services exceeding the machine's capabilities.

Saudi Arabia should fully embrace artificial intelligence to improve the country's economic growth without any hesitation. Most people fear that Artificial intelligence will result in the displacement of human labor, [5]. However, numerous artificial bits of intelligence tend to target non-labor cost savings. The primary motive for implementation is to reduce labor costs. The research points out that 24 percent of early adopters of artificial intelligence ought to increase the human workforce to respond to artificial intelligence while expecting massive growth in their business activities. Many firms are expected to reduce labor upon implementation, [2]. However, 82 percent of artificial intelligence-aware firms are not expected to reduce the labor force significantly. The labor force would be required to reskill to allow for the coloration between the human and the Artificial intelligence labor force.

8 Future Research

Artificial intelligence is a broad and new aspect of the corporate business world. However, there is limited research carried out on the subject matter. There is a need to build further on this research and other aspects adopted to eradicate the stereotype that artificial intelligence would displace human labor. Research ought to be carried out to examine the future of human resources in the face of the inevitable adoption of artificial intelligence, [18]. Due to its potential and risks, AI is a matter of global concern. Governments, companies, third-sector organizations, and political communities must decide what kind of society we want to deliver to future generations, which values should guide the evolution of AI systems, and which limits and constraints we should impose on them (while we still can). There is no single straightforward answer to these questions. And that is excellent because it compels us to think, talk, and collaborate, reminding everyone of what makes us human

9 Conclusion

Artificial intelligence can be defined in two different ways. The first way that Merriam-Webster dictionary defined artificial intelligence is a branch of computer science dealing with the simulation of intelligent

behavior in computers. Their second definition was "the capability of a machine to imitate intelligent human behavior." Artificial integration adoption in Saudi Arabia is still in the infancy stage. Consequently, it is problematic to determine the accurate potential effects of Artificial intelligence on firms and sectors. In most instances, the non-adopters forms are likely to argue that they do experience challenges when crafting the business case in terms of Artificial intelligence. A close examination of the early adopters of artificial intelligence generates vast returns. For instance, there is the potential to transform some business activities as well as the potential to alter others. Most firms across the globe are adopting artificial intelligence to reduce operational costs in all production sectors. The Coronavirus pandemic not only led to a downfall in the stock market but also took a toll on businesses internally. Employees lost jobs, took significant pay cuts, and decreased labor production. If the pandemic drags on for an extended period, it could cause businesses not to recover from being shut down. The pandemic has created mass fear and panic among people.

Saudi Arabia has made diverse strides in making sure that artificial intelligence is overly accepted by businesses. However, there has been a slow acceptance of AI by businesses due to a lack of clear reforms of the dos and don'ts by the government. This has in turn made many businesses lag on the benefits associated with the use of AI. The entirety of the adoption of AI from the results in the research showed that the gap in the research makes it hard to have adequate and relevant data regarding the use of AI by businesses.

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