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Adaption of Artificial Intelligence (AI) to Enhance Business and Collaboration between Countries, Focusing on Saudi Arabia

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Abstract

Artificial intelligence (AI) is one of the most ingenious inventions drastically transforming the business world. The question is whether the current growth of AI is all hype or if it has the potential to revolutionize the world is raised by the abundance of intelligent goods and services that have emerged in recent times. Technological developments in AI pave the way for creating technologies that resemble humans and can operate independently and imitate our intellectual processes. Numerous industries have shown considerable interest and enthusiasm in adopting AI due to technological advancements. As a result, numerous businesses are making significant investments to leverage this opportunity through innovative business models based on AI. The study aims to establish a model based on an evidence-synthesis approach that demonstrates how the business sector in Saudi Arabia can incorporate AI to achieve better outcomes and strengthen its relationships with other countries. However, the study also highlights some advantages and disadvantages of adopting AI models in the business industry so a balanced approach can be used to incorporate AI in different aspects of the business. The study recommends incorporating AI in different health, education, and business sectors in Saudi Arabia to foster international relationships in Saudi Arabia.

Keywords: artificial intelligence, business, AI models, Saudi Arabia.

I. INTRODUCTION

Artificial intelligence (AI) has revolutionized business, the economy, and society by modifying the thought patterns, relationships, and experiences of stakeholders and the general population. It has been asserted that AI will disrupt business functions and procedures around the globe in different domains. Businesses that use AI applications could anticipate improvements in additional business value, including higher profits, lower expenses, and more streamlined operations (Alsheibani et al., 2020).

AI is the ability of a processor to do comparable tasks (most of the time partially) to human knowledge and decision-making. As demonstrated by companies like Airbnb, Flip Cart, Ola, eBay, Amazon, Uber, Mantra, and others that have integrated AI into their cutting-edge business models, AI is revolutionizing how businesses operate (Fountaine et al., 2019). Its intellectual functioning and smart performance have helped researchers study it differently. For example, social scientists have discussed its ethical and legal ramifications. IT professionals and researchers have created sophisticated deep neural learning algorithms.

In contrast, business management researchers have investigated how AI affects stakeholders, businesses, and consumers in an increasingly automated and connected business environment. This emerging and rapidly developing technology affects the creation of digital platform business models, even while it exposes many companies to

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new competitors using the same technology. Artificial intelligence (AI) and machine learning (ML) algorithms have become widely used in business over the past few decades. They have solved numerous innovative business problems and produced knowledge-driven platforms for startup businesses (Ferrario et al., 2020). However, stakeholders and the business world are still raising several concerns regarding adopting AI completely in business because AI is still in its early stages, and it is hard to foresee where the technology will go. The world needs to consider the needs and expectations of AI, including those related to implementation, employment, principles, learning, understanding, and evolution, to understand its best applications.

This research paper aims to investigate the efficacy of AI models in modern business in different sectors in Saudi Arabia. As an outcome, An AI-based business model is being developed that can be incorporated into business to grow the business industry. This model also addresses the communication gaps of Saudi Arabia with other countries in the business world so that international relationships can be enhanced. This endeavor is accomplished by presenting an agenda that can further flourish our understanding and a synthesis of the corpus of current knowledge. As a result, we do a methodical compilation of existing literature, present an overview by synthesizing the material, and produce an extensive report that directs further research.

II. LITERATURE REVIEW

Some of the most innovative techniques and instruments for modernizing businesses for automated systems include artificial intelligence and business intelligence. These cutting-edge tools are helpful for marketing, selling, soft promotion, invention, and design purposes. The application of artificial intelligence (AI) in business-to-business (B2B) marketing has received significant attention due to the availability of data from several sources, the progression of big data analytical methods, enhanced processing capacity, and reduced expenses (Dwivedi et al., 2021; Lui et al., 2021). Cloud computing and artificial intelligence are proliferating, intensifying the meaning of ideas, creativity, design, opinions, perceptions, convictions, emotions, and admiration in business (Mistry et al., 2024). As a result, the potential for AI business models proliferates when data and business intelligence increase over time. Evolution in AI-driven computerization refers to adding intelligence from connected data and related devices and connected media, social platforms, business, and big data platforms. It also refers to advancements in business model transformation through technological synchronization, showing very intellectual outcomes in business (Enholm et al., 2022).

The adoption of AI technologies by developed countries is accelerating quickly. According to Chen et al. (2021), nations' GDPs can immediately rise with AI. As AI is used across several industries, it is anticipated that a country's economy and power will grow as it becomes its leader. China made artificial intelligence (AI) a "new and important" driver of their economy in 2017, and by 2020, they intended to lead the world in this field. The plan has been achieved, and today, the Chinese AI industry generates about $59 billion in US dollars yearly. This was stated in the Chinese State Council's development plan. Similarly, various nations have developed strategic plans concerning the uptake and spread of artificial intelligence. Some examples are India, the Philippines, South Korea, Canada, and Russia (Chen et al., 2021).

Mishra and colleagues (2021), in their study on an integrative business approach, presented a business model shown in Figure 1. In this model, they targeted different sectors, such as health care, the public sector, manufacturing, energy, and media. According to the researchers, the model can be applied in stages to avoid any unfavorable

circumstances gradually, from minor to significant applications. This model consists of various AI technologies that can be incorporated into business. They believe that businesses that successfully leverage AI have the potential to completely change the global economic business landscape by bringing about a startling revolution with their new digital business models and practices.

Figure 1
AI business Model (Mishra & Tripathi, 2021)
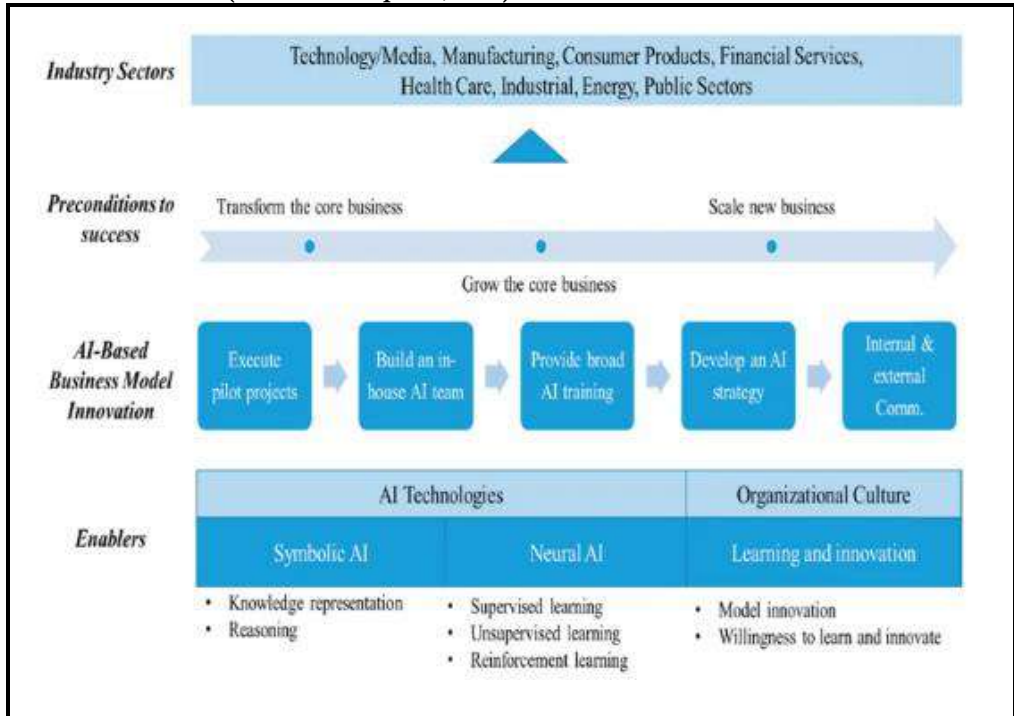
Enholm and Colleagues (2022) reviewed past studies and presented their research framework. This organizational framework demonstrated that several significant organizational, technological, and environmental elements significantly impact an organization's capacity to implement and use artificial intelligence. Moreover, they distinguished between first- and second-order effects when describing the consequences of AI. These stand for effects manifesting at the firm and process levels.

Insert Figure 2 here.

AI technologies can completely transform numerous vital facets of our everyday lives and can be implemented throughout an organization's value chain. Artificial intelligence applications can be roughly categorized into two groups based on their intended uses: automation and augmentation (Farayola et al., 2023). While augmentation refers to enhancing human intellect by providing knowledge to facilitate decision-making, automation refers to AI systems that replace human labor. Both automation and augmentation can be applied to various organizational processes, or they might impact the organization's customers by introducing new or enhanced AI-powered products and services (Wamba-Taguimdje et al., 2020).

According to Chui and colleagues (2018), while building out the technology infrastructure for AI may be a significant component, companies that want to integrate AI into their core business must be able to manage the resources required and have established procedures and systems for planning, coordinating, and monitoring projects

from inception to conclusion. Furthermore, apps utilizing AI must go through multiple development and improvement stages. A fundamental prerequisite for most AI applications (such as those in the public sector) is considering ethical considerations and responsible design principles (Papagiannidis et al., 2021).

Figure 2
Organizational Framework with AI (Enholm et al., 2022)
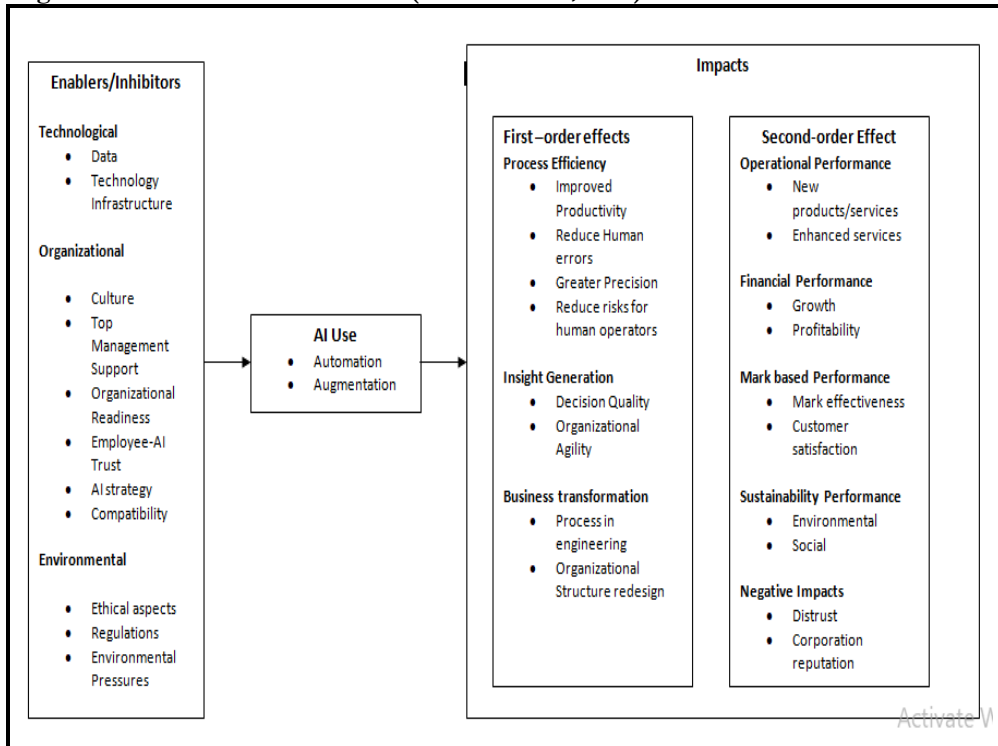
Saudi studies also showed evidence for the incorporation of AI in business. It is stated that the Saudi Arabian government introduced the Vision 2030 program in 2016 with objectives and development paths motivated by the goal of ensuring that the country can become less dependent on oil by using AI technology (Alotaibi et al., 2023). One concept calls for researching and investing in AI technology to integrate it into "Neom," a brand-new megacity. Saudi Arabia has recently shown a growing interest in the AI revolution. For example, King Salman Bin Abdulaziz ordered in September 2019 to establish a "National Authority for Data and Artificial Intelligence." While several technologies have emerged in the market today, Saudi Arabia still needs to work on its implementation. Hence, specific challenges are being discussed in the literature by Alshahrani and colleagues (2021) that can be studied further in Saudi Arabia.

Alshahrani and his colleagues (2021) argued that AI adoption in Saudi Arabia will enhance business operations and international collaboration between organizations and countries. Sectors include, but are not limited to, optimizing supply chain management and improving language transition through AI-powered language translators, which will promote cross-cultural communication and, eventually, tourism. Similarly, joint AI-powered collaborative research and development initiatives. Similar initiatives and leveraging their potential can optimize processes, facilitate knowledge exchange, and enhance economic growth. This will promote synergies and better relations between Saudi Arabia and the rest of the world.

Figure 3
Challenges to AI Adoption in Saudi Arabia (Alshahrani et al., 2021)
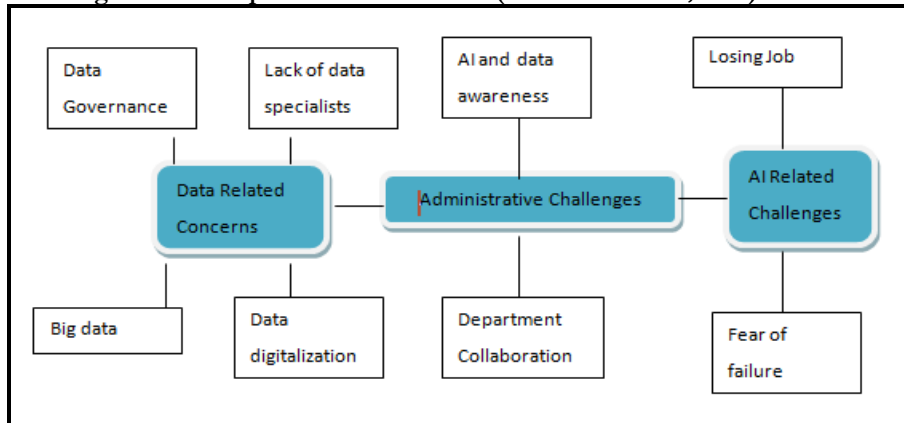

III. RESEARCH METHODOLOGY

A collection of papers on AI and its implications in business was gathered from the online libraries of Google Scholar, Web of Science, and Scopus to determine the most pertinent material for this review. Papers published in peer-reviewed journals in business-related categories that contained the terms "artificial intelligence", "artificial intelligence in business", "AI in international business," and "AI in Saudi Arabia" in their title, abstract, and keywords were chosen for inclusion. The researcher set specific inclusion and exclusion criteria to avoid any biases and ambiguity in the topic of the study, such as all those studies published in and after 2015 were included in the study to gather the most recent data. Only those studies in English were chosen to understand the data and findings of the study. At the same time, other languages, such as German, Spanish, and French, were separate from the present study. Moreover, the researcher emphasized the studies that were majorly done in the Saudi context. However, this was a relaxed criterion for selecting any study. At the end of this stage, the researcher selected 36 studies in total.

The next step was the selection process, which comprised scrutinizing and evaluating the most relevant studies. For this purpose, the authors gradually read the abstracts of 36 studies. Some studies were literature reviews, some were surveys, and a few were qualitative. The objectives and research questions were assessed in selected studies. At that time, seven studies were rejected with a different objective from our study. Then, the methodology section was thoroughly assessed by authors from the remaining studies, excluding nine more studies with an irrelevant framework. A concept matrix was established to synthesize findings and categorize the studies' results. To do this, a spreadsheet including data from the research was created, and the papers were analyzed. After the final review, 22 studies were selected to incorporate into the present study.

IV. RESULTS AND DISCUSSION

This paper focuses on the role of AI in business growth and development at the national and international levels in Saudi Arabia so that the sector can significantly enhance according to digital requirements. Based on the literature review, some critical findings were achieved, which helped researchers design an innovative AI business model, as shown in Figure 4.

Figure 4
AI Business Model
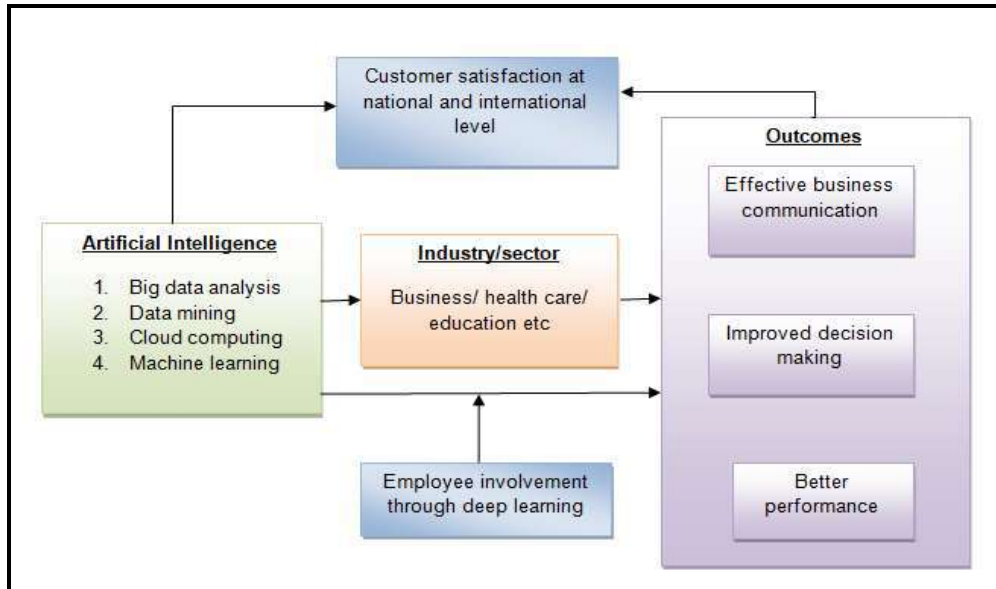
This model guides business investors, owners, and other stakeholders in Saudi Arabia to incorporate AI features in their businesses in various sectors.

4.1. Incorporation of AI in the Business Sector in Saudi Arabia

Saudi Arabia seeks to digitalize its country to compete with other developed nations. To adopt AI, the Saudi government and business sector must first know their capabilities and limitations in order to educate themselves and develop a trained workforce that can operate AI tools. As per literature (Mashat, 2020; Alotaibi et al., 2023), the Saudi government has many plans in the pipeline to adopt AI technologies in large and small business setups, but the entrepreneurs do not have enough knowledge and skills to utilize the latest technologies for performing different business tasks.

4.2. Big Data Analysis

Data is produced in all fields, including business, industry, healthcare, education, and daily living. Regarding acknowledging the potential of the Internet of Things, Big Data, Data Science, and Open Data, the Kingdom of Saudi Arabia is a regional leader. As a crucial part of their ongoing operational advancement, big Data techniques are being implemented by many of the Kingdom's progressive government departments, institutions, and public and private sector organizations (Alam et al., 2021).

Still, big data analysis is in its infancy and needs to mature enough. In the education sector in Saudi Arabia, education could benefit from using big data analytics in a variety of contexts. These include boosting student retention, giving them more excellent feedback, gathering attendance information, improving instruction, and controlling costs (Aseeri & Kang, 2023). On the other hand, many fascinating opportunities in various aspects of healthcare operations, such as diagnosis and treatment, clinical decision support, population health management, etc., have been made possible by big data analytics in the healthcare industry. Other businesses in Saudi Arabia can use big data analysis for customer retention, business communication, data management, etc.

4.3. Data Mining

Data mining is the process of obtaining valuable information from existing knowledge. Businesses are under tremendous pressure and competition due to multiple local and foreign drivers entering the market. Data mining, training, and development are crucial for businesses to obtain a competitive edge through knowledge management and personnel roles in Saudi Arabia. The literature suggests that data mining is still challenging due to a lack of resources and security threats in the Saudi Kingdom (Mumtaz et al., 2023). Mumtaz and colleagues (2023) believed that data mining can enhance employees' involvement in business, their understanding of the latest technologies and tools, and their interactions with customers nationally and internationally in Saudi Arabia.

4.4. Cloud Computing

Some have referred to cloud computing as the next generation of computer models. The National Institute of Standards and Technology (NIST) described cloud computing as allowing easy, on-demand network access to a shared pool of reconfigurable computing resources (Alhammadi et al., 2015). Adopting cloud computing services has several benefits, including improved business services, increased operational efficiency and quality, and high flexibility that lets users select the right solution when they need it without wasting related resources.

According to Alarefi (2023), Saudi Arabia actively promotes cloud computing usage, and the efforts are paying off. Saudi Arabia's cloud computing business has been expanding gradually; by 2026, it is expected that yearly spending on public cloud services will amount to $2.5 billion, or a 25% compound annual growth rate. Cloud computing helps business owners and employees maintain and store data effectively. It also makes it easier for businesses to share and receive data internationally.

4.5. Machine Learning

Algorithms, or mathematical processes, are used in machine learning to analyze data. The goal is to find practical patterns, correlations, or links between various data pieces. After the linkages have been established, conclusions regarding the conduct of newly discovered cases can be drawn from them (Finlay, 2018). Recommendation systems are among the most widely used and well-liked machine learning applications in the commercial world. These systems employ machine learning algorithms to evaluate user feedback, behavior, and preferences to make relevant product, service, or content recommendations (Pramanik & Jana, 2023). Adopting machine learning in business in Saudi Arabia can facilitate better customer relationships and boost their feedback system, leading to better decision-making and outstanding business performance (Al-Baity, 2023).

4.6. Challenges in Adapting AI Model in Saudi Arabia

The most critical challenge in Saudi Arabia is the need for a more trained workforce and IT specialists in business (Enholm et al., 2022). However, the government is developing and implementing training plans for IT professionals and business personnel to provide them with up-to-date knowledge. This knowledge gap is also a big challenge for senior workers who are rigid about learning new skills.

1) Managing data security and privacy is critical, particularly in light of recent laws like Saudi Arabia's personal data protection law (PDPL) (Alshammari, 2023). Innovation and conformity can be hard to balance. For AI systems to work well, much high-quality data must be available. More pertinent, uncontaminated, and organized data must be collected in several business sectors.

2) Even while Saudi Arabia has made large expenditures in digital infrastructure, some areas, especially rural or remote areas, might still need to gain the technological groundwork to enable the widespread deployment of AI (Alotaibi et al., 2023). Adopting AI frequently necessitates having reliable cloud computing resources. Businesses may need help to ensure sufficient and safe cloud storage options.

3) Opposition to change can exist within organizations, just like in many other places. Adopting AI may be slowed down by hierarchical structures and traditional business processes (Al-Baity, 2023). It can be challenging to gain decision-makers' and employees' faith in AI systems, mainly if there is a lack of knowledge or a fear of losing their jobs.

4) In Saudi Arabia, the legal groundwork for AI is currently being developed. Businesses may need more certainty regarding compliance, particularly with the introduction of new laws and regulations (Alzahrani, 2024). Concern over the ethical development and application of AI systems is also developing. This covers employment effect, justice, and prejudice in AI systems.

5) Effective AI deployment frequently necessitates cooperation between corporations, foreign partners, government agencies, and academic institutions. In Saudi Arabia, efforts are ongoing to create such an ecosystem (Al-Baity, 2023). Although Saudi Arabia is taking a startup initiative, it is still in its infancy compared to more developed international tech hubs. This may discourage exploration and creativity in AI.

To address these issues, a multidimensional strategy is needed, including government assistance, educational programs, corporate and academic collaboration, and an emphasis on increasing public trust and knowledge of AI technology.

4.7. Potential Risk in Adapting AI in Business in Saudi Arabia

Organizations in Saudi Arabia should be aware of the various dangers associated with implementing artificial intelligence (AI). Since AI systems rely on enormous volumes of data, one significant danger is data privacy and security concerns (Alshammari, 2023). Any breaches or misuse could result in serious legal problems and harm one's reputation, especially in light of strict laws like the personal data protection law (PDPL). Furthermore, AI algorithms can inadvertently reinforce or magnify preexisting biases that produce unfair or discriminatory results, especially in the employment or customer service sectors (Al-Baity, 2023). Another concern is job displacement since AI automation may result in a smaller workforce that can spark unrest in the community or opposition among workers.

Furthermore, financial risk is associated with the high cost of using AI, mainly if the ROI needs to be clarified or the technology needs to produce the desired results. The ethical hazards linked to artificial intelligence, such as worries about accountability, transparency, and potential misuse, may cause public mistrust and regulatory reaction. Last, relying too much on outside knowledge and technology could expose companies to geopolitical risks, such as interrupted supply chains or prohibitions on technology transfers, which could impede the long-term development and autonomy of Saudi Arabia's AI capabilities.

V. CONCLUSION

This paper concludes that incorporating AI tools and procedures into business is necessary in today's digitalized world. An AI-based business model has been developed to enhance awareness in Saudi Arabia so that its effective use can provide better outcomes in the future. Adopting AI technologies and investing in the research and

development of such technologies will optimize efficiency, innovation, and competitiveness, positioning Saudi Arabia for sustained growth in evolving global trends.

5.1. Recommendations

Based on the study's results and discussion, it can be recommended that more research be done in specific sectors to investigate the impact of AI implementation in Saudi Arabia. A comparative study can also compare the outcomes of AI-based tools and services in developed countries to replicate the best measures in Saudi Arabia. By conducting targeted investigations and leveraging competitive analysis, Saudi Arabian policymakers and businesses can discuss and devise approaches to maximize the benefits of AI adoption to achieve Vision 2030. Future studies need to thoroughly investigate all the challenges and possible risks and make appropriate recommendations for adapting AI in Saudi Arabia's business industry.

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