The Reality of Artificial Intelligence (Al) and Its Applications in Arab Countries (Challenges and recommendations)

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ABSTRACT

Artificial intelligence and robotics are the engines of the fourth industrial revolution. In the wake of the 4.0 industrial revolution, governments and businesses across the world, and especially the Arab countries, are gently shifting towards artificial intelligence and advanced technologies. In the Arab world, the UAE ranked second and ranked 36th globally. On another side, Qatar is in third place in the Arab world and ranked 42 globally. The study aims to overview the reality of Artificial Intelligence (Al) and its applications in the Arab world and emphasis Palestinian reality. The study adopted the descriptive approach, by inferring and analyzing studies, research, books and periodicals related to its subject. The present research has highlighted a few strategies, recommendations and perspectives needed urgently to transform our daily life in the Arab world. In actuality, this study examines the future of Arab peoples if artificial intelligence is adopted in various fields of life.

This study seeks to analyze the adoption of Artificial Intelligence (AI) in the Arab world. Particularly, the study is important to University leaders where institutes must be equipped with the best applications of AI; also, for owners of factories and various institutions and to help them to identify the expected transformation of artificial intelligence in various fields.

Keywords: Artificial Intelligence, investment, Arabic, applications, Knowledge, Resources.

1. Introduction

In the wake of the 4.0 industrial revolution, governments and businesses in the Arab world are gently shifting towards artificial intelligence and advanced technologies Ahmed., 2019 [1] . According to Fouda[21] , UAE even appointed a minister for AI and Saudi Arabia was the first country to give nationality to a robot. Shamout and Ali [36]

 Identified that AI and robotics are the engines of the fourth industrial revolution. Historically, the first industrial revolution began with the invention of the steam engine in 1784, the second began with the use of electric energy in production, communications and communications in 1870. The third began with the spread of the computer and the sending of the first message over the Internet and the entry of the computer into the world of communications, manufacturing and education in 1969[1]. However, the questions raised in mind are why and how artificial intelligence is so popular in MENA(Middle East and North Africa)countries? How does it affect the states' economies and standard of living?

In a nutshell, AI refers to systems or machines that mimic human intelligence to perform tasks and can make repeated improvements based on the information they collect. AI expresses itself in various ways (Shamout and Ali, 2021) [36].

Here are some examples:

• Chatbots use artificial intelligence to quickly understand customer problems and provide more effective responses.

• Intelligent assistants use AI to analyze important information from large free-text data sets to improve programming.

• Recommended engines can provide automatic recommendations for TV shows based on users' viewing habits.

AI is more than a format or function related to the process and capabilities of data analysis and superpower thinking (as shown in Figure 1). Although the AI shows images of high-performance humanoid robots occupying the entire world, the AI is not intended to replace humans. Its goal is to dramatically improve human capabilities and partnerships, making it a very valuable business asset.
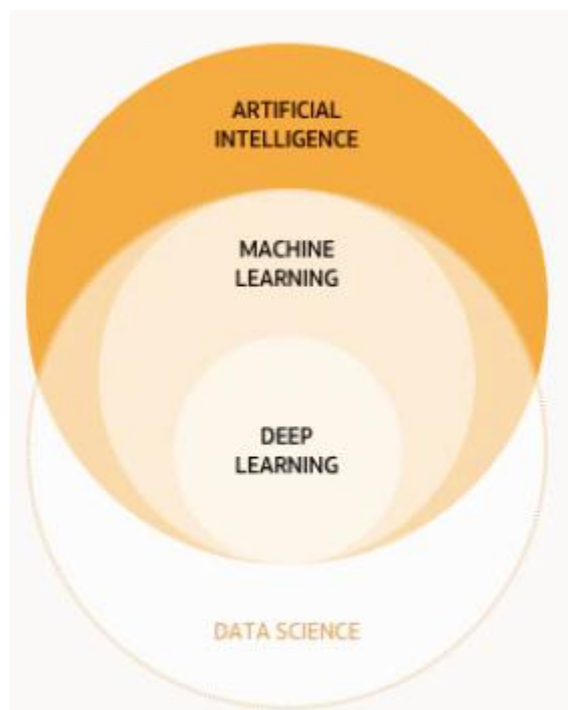
Figure 1: Super Powered Approach of Artificial Intelligence

1.1 Problem Statement

In previous research, AI is constantly taken as a debatable topic that is often represented in a negative way (Bao, 2019) [14] . However, Johnson (2022) [26] argued and describe AI as a blessing in disguise for companies while for some it is a technology that threatens the very existence of the human race because it may be able to control the human being. AI has affected our way of life either directly or indirectly and shapes the future of tomorrow. This prompted some researchers to ask an interesting question: To what extent can technology transform our Arab world (Keezhatta, 2019) [27]. Therefore, this study examines the future of Arab peoples if artificial intelligence is adopted in various fields of life.

1.2 The Future of Arab Countries in the Age of Artificial Intelligence

In the Arab world, AI technologies improve the performance and productivity of companies by automating processes or tasks that previously required human effort (Johnson et al., 2022) [26]. In the view of Alhashmi, Salloum and Mhamdi (2019) [4], AI can also make sense of data on a scale that was not ever done by human intelligence. This capability is leading to significant business benefits; for instance, Netflix uses machine learning to provide a level of personalisation that helped the company to grow its customer base by more than 25% in 2018 (Darwish et al., 2021) [18]. The Minister of Communications and Information Technology in the UAE reviewed the most prominent achievements in the field of digital transformation, among which the adoption of e-government services system and electronic payment gateway for small and medium enterprises (SMEs) are common (Radu, 2021) [31].

In the study of Yousuf et al. (2021) [38], the common notion is that the MENA region considers as a "technology desert" that is still empty of ideas and the real development of technology. Darwish et al. (2021) [18] also revealed the existence of a rich, rapidly growing technological oasis that mix the effect of Western, Eastern and local cultures which have their independent character. According to Radu (2021) [31], if the failure of Arab countries to join the successive industrial revolutions has led to industrial backwardness, then their failure to join the newly launched artificial intelligence revolution will lead to mental retardation. This statement may be shocking, however; what if the differences in intelligence power become so large between developed countries and other countries of the world, isn't the logical name for the "backward countries in intelligence"? Scientists are currently making great efforts to develop artificial intelligence, which has become superior to humans in performing many tasks, not only physical and mathematical but; also intellectual such as medical diagnosis and legal research (Yousuf et al., 2021) [38]. For instance, the accuracy of the computer Watson produced by the company "IBM" exceeded the accuracy of a human doctor in diagnosing cancer diseases by four times. Its accuracy in terms of complex legal advice reached 90%, compared to an accuracy of only 70% for a lawyer specialized in this field (Nawaz and Saldeen, 2020) [28]. Also, Facebook now owns smart software that can recognise faces with higher accuracy than a talented person can do in this field.

1.3 The Launch of Artificial Intelligence

According to Reis, Santo and Melão (2019) [33], two main factors played a major role in the launch of artificial intelligence, which was not available a decade ago. The first factor is the huge data that has become available on global networks in all fields, therefore; advanced computers can search within them, compare them and extract results from them very quickly. The second factor is the great development taking place in the field of "deep learning", that is, research and software related to developing the capabilities of machines for self-learning, which is the main goal of artificial intelligence (Alqudah and Muradkhanli, 2021) [9].

Many scientists and thinkers expect artificial intelligence to surpass human intelligence in most work done by humans within two decades at most. AlShamsi et al. (2021) [10] said, Arab world be able to continuously develop without the need for human intervention. The development is in the form of successive cycles so that from each cycle a new generation is created that is more advanced than the previous one, and more rapidly in its development (Shamiulla, 2019) [35]. This is quickly lead to the emergence of a superintelligence far superior to all human intelligence combined. This phenomenon is known as 'technological singularity. American journalist Kevin Kelly, the founder of the famous wired magazine, says that "the singularity is the point at which the changes that would take place in the next five minutes will outweigh all the changes that occurred during the previous million years (Pedro et al., 2019) [30].

El-Jardali (2020) [20] viewed, to prevent the behaviour of artificial intelligence from becoming out of control due to its superiority over human intelligence. Elon Musk,

the founder of the smart car company Tesla and SpaceX and their CEO, proposes to integrate artificial intelligence with natural intelligence by adding a digital intelligence layer to the human brain, which he called the Neural Lace. It will lead to the production of the cyborg, a human mixed with artificial intelligence that has appeared in science fiction films (Al Mansoori, Salloum and Shaalan, 2021) [2].
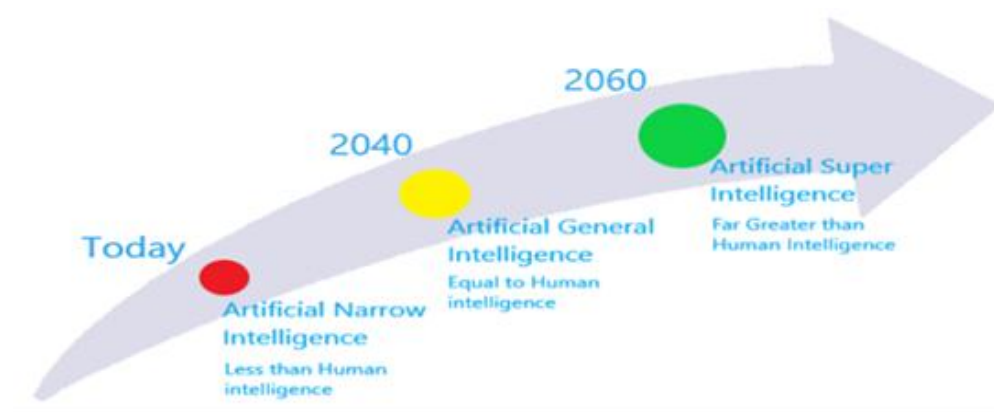

Fig.2. Future evolution of Artificial Intelligence,(Ballant C. (2018)).

1.4 Research Aim
This study aims to overview the reality of Artificial Intelligence (Al) and its applications in the Arab world.

1.5 Research Questions
1. What is the current status of AI in the Arab world?
Sub-Questions
2. How can artificial intelligence be introduced to these countries?
3. What challenges do we need immediately to initiate AI in the Arab world?
4. What are the future impacts of AI applications now and in the future of life?

1.6 Research Objectives
• To identify the current status of AI in the Arab world.
• To identify the ways through which artificial intelligence can be introduced to Arab countries.
• To analyse the challenges which need immediate response to initiate AI in the Arab world.
• To analyse the future impacts of AI applications now and in the future of life.

1.7 Research Significance
The study is significant to adopt artificial intelligence in the Arab world and present it to decision-makers in Arab countries. This study is particularly important to

University leaders from the deans of the affiliated colleges and the supporting deanships. Where it must be equipped with the best applications of artificial intelligence and for owners of industries and various institutions that help to identify the expected transformation of artificial intelligence and prepare for it in various fields.

2. Literature Review
2.1   Artificial Intelligence
Artificial intelligence is now an umbrella term for applications that perform complex tasks that once required human intervention, such as communicating with customer's online or playing chess (Jabeen, Al Zaidi and Al Dhaheri, 2021) [24]. The second Al Mansoori, Salloum and Shaalan (2021) [2], the term is often used interchangeably with its subfields, including machine learning and deep learning. For example, machine learning focuses on building systems that learn or improve their performance based on the data consumed by the user. However, it is important to note that all machine learning is AI; however, not all AI is machine learning. AI optimization is crucial, many companies are investing heavily in data science teams (Schühly, Becker and Klein, 2020) [34].

2.2   Capabilities of Artificial Intelligence
In the context of Almarzooqi (2019) [7], AI conveniently receives information, because it can accurately distinguish numerous problems. One of the most important capabilities of artificial intelligence is its response to change, its flexibility and speed of reaction in all cases (Schühly, Becker and Klein, 2020) [34]. By Bhargava, Bester and Bolton (2021) [15], artificial intelligence can make the right decisions with a view, and thus study all the possibilities and master their results, so that the best decisions can be made that lead to the selection of the desired results. Almarzooqi (2019) [7] able to detect and correct errors quickly and make better corrections in the future. So, it can be said that artificial intelligence started with the development of a few different computer programs. Bhargava, Bester and Bolton (2021) [15] studied, the basic principle of AI is to imitate and go beyond the way people understand and interact with the world, which is rapidly becoming the foundation of innovation. Equipped with many forms of artificial intelligence machine learning that recognizes patterns in data to make predictions, AI can add value to a business by providing a more complete understanding of the wealth of available data and by performing highly complex tasks and routines. Automation (Haner and Garcia, 2019) [23].

2.3   Prominent Areas of Artificial Intelligence
Artificial intelligence covers all technical areas that require logical thinking, knowledge, planning and implementation of ideas and hypothetical insights based on the choice of the appropriate solution (Valle-Cruz et al., 2019) [37]. According to Dauvergne (2021) [19], one of the most important areas where simulation programs and applications are leading industries through which robots can perform the tasks of the human race. Develop computer programs and applications in various fields, including medicine, engineering, commerce and investments, among others (Albinali and Hamdan, 2020) [3]. Creating scientific simulations by examining ideas,

recognizing faces, triggering memory, and other functions. Also, by developing engines with intelligent capabilities, such as driverless and drones; Therefore, the use of artificial intelligence is not limited to these areas.

2.4   Driving Factors for the Adoption of Artificial Intelligence

In the Jain (2020) [25] study, three factors are driving the development of AI across industries.

The first is that it offers simple and convenient high-performance computing. The abundance of enterprise computing power in the cloud has made it easy to access affordable, high-performance computing solutions. Before this development, Albinali and Hamdan (2020) [3] claimed that the only computing environments available for AI were non-cloud based and prohibitively expensive.

Have large amounts of data for training. AI has to learn from a large amount of data to make correct predictions. According to Jain (2020) [25], the advent of various tools to collect disaggregated data, as well as the ability of organizations to easily and cheaply store and process this data, both structural and unstructured, has resulted in more organizations being able to create and train artificial intelligence algorithms.

Applied artificial intelligence technology offers competitive advantages. Organizations increasingly recognize the competitive advantage of applying AI insights to business objectives, making it a priority for the entire organization. For example, AI technology-specific recommendations can help you make better decisions faster. Obaid and Sharma (2020) [29] said that the many features and capabilities of AI can reduce costs, reduce risks, reduce time to market, etc.

2.5   Types of Artificial Intelligence

There are two types of artificial intelligence, one is strong AI and the other is weak AI. Strong artificial intelligence includes devices that can think just like a human, with the ability to learn, evaluate and make decisions. An example of strong AI is made by the company (Hanson Robotics) in Hong Kong when it was able to manufacture one of the robots, which took 10 years to manufacture and its appearance in April 2015. The robot was in the form of a girl and they called her (Sofia) who was very similar to humans, as the outer layer is made of a material similar to human skin. In addition to having the ability to change her facial expressions just like a human. Arab, Bouida and Ibnkahla (2019) analysed, she can receive conversations, understand them fully and respond with absolute logic which contributed to her participation in several international conferences. All the attendees agreed that she is like a natural human in appearance in the context of way of thinking and interaction. Also, Sophia can make decisions and educate herself, which makes her one of humanity's greatest achievements. Surprisingly enough, she obtained citizenship and an ID card to become a citizen the other one is weak artificial intelligence: Machines that have the ability to reproduce a limited part of human intelligence, such as calculators.

2.6   Benefits and Challenges of Activating Artificial Intelligence

Many success stories demonstrate the value of artificial intelligence. Companies that integrate traditional business applications and processes with machine learning and cognitive interaction can dramatically improve the user experience and increase

productivity (Bragazzi et al., 2020) [16]. However, there are some obstacles. Few companies have adopted AI at scale for various reasons. If they don't use cloud computing, for example, AI projects are often very expensive. They are also complex to build and require a high demand for skills with insufficient supply. Second AlShamsi et al. (2021) [10], knowing when and where to integrate AI and when to turn to third parties will help reduce these difficulties. Furthermore, companies invest billions in developing artificial intelligence applications because of their countless advantages. The major advantage is Artificial intelligence helps us make tasks easier, a robot can help with household tasks. On other hand, AI can perform human operations while avoiding the mistakes of human doctors. Besides, speed and productivity increase compared to the human effort as in factories helping. Moreover, it helps students in education and not progress one step without mastering the other steps. Combating crimes using artificial intelligence applications which do not affect by environmental conditions. According to Nawaz and Saldeen (2020) [28], permanent work without a break so that AI can carry out the exhausting and dangerous work that is done by the human being, such as rescuing the injured in fires and clearing minefields.

2.7   Disadvantages of Artificial Intelligence

When there is an advantage to anything, there must be some disadvantages that exist. When the applications of artificial intelligence spread shortly and have the full ability to make decisions this will make them free of charge. However, AlShamsi et al. (2021) [10] said that replacing the human being in all tasks increases the unemployment rate. Obaid and Sharma (2020) [29] argued, with the spread of artificial intelligence applications, these machines threaten the continuity of the human being on earth. After launching AI techniques, people get lazy; also, the costs of artificial intelligence are high. Shamout and Ali (2021) [36] said that AI weakens human interaction because dealing with artificial intelligence is empty of emotions, which leads to weakness in team spirit. These machines may find a way to develop themselves without the need for humans, therefore; there must be some way to control these machines when they get out of hand. According to Obaid and Sharma (2020) [29], machines can only perform those tasks they were designed to do and tend to crash or provide an irrelevant output when data that is not stored in them is requested.

2.8   Contribution of Artificial Intelligence in Arab Countries

a) Saudi Arabia

Saudi Arabia is slowly becoming the leader in the application of advanced technology connected to AI. There are several foreign investments by the Public Investment Fund and national creativities by the government and private sector (Alqudah and Muradkhanli, 2021) [9]. The Kingdom's achievement of this advanced rank was the result of the integration of the efforts of many government agencies and bodies that participated in the application of the initiatives of the National Transformation Program in line with the Kingdom's Vision 2030 (Nawaz and Saldeen, 2020) [28]. This year's challenges, such as its success in launching the World Summit on Artificial Intelligence, managing and efficiently operating secure video communication systems for the Riyadh Summit of the Group of Twenty.

According to the Shamout and Ali (2021) [36], the Kingdom will invest more than $20 billion in artificial intelligence until 2030. Saudi Arabia had signed 3 strategic agreements with IBM, Alibaba, and Huawei, at the World Summit on Artificial Intelligence recently International ministers and officials described the value of data and artificial intelligence as the "new oil" that countries need and the virtual employee that countries and governments want to attract and employ to implement strategic plans for the digital transformation process, and achieve the expected economic impact in the future (Alqudah and Muradkhanli, 2021) [9].

According to Obaid and Sharma (2020) [29], the summit came in the context of the Kingdom's attempt to achieve its aspirations for global leadership through a data-based economy and artificial intelligence, and the Kingdom plans to be ranked among the first 15 countries in this field. Saudi Arabia also aims to establish 300 companies specialised in technology, information and data, in a step it hopes will be one of the axes of alternative economies that it seeks, after achieving savings and revenues of 43 billion riyals in 2019 only (Schühly, Becker and Klein, 2020) [34]. Among the goals is training 40% of the concerned workforce on data and artificial intelligence with more than 20,000 specialists to create around 40,000 direct and indirect jobs related to the domain (Jabeen, Al Zaidi and Al Dhaheri, 2021) [24]. There is no doubt that artificial intelligence will play an important and central role in achieving the Saudi Vision 2030, as it is the most prominent title and strong presence in many topics and titles such as building smart cities, the Internet of things, personal assistance systems, customer service robots, automated chatting, expert systems, medical diagnostic systems, computer vision and voice interaction systems. According to Shamout and Ali (2021) [36], all the previous addresses that were declared and that were not mentioned represent realistic situations and needs that exist in the life of the Saudi society, which needs to exist, develop and improve eternally in various fields such as education, health care, agriculture, economy, transportation and security, and this ultimately means a strong presence of artificial intelligence, and that it is one of the supports of digital transformation that Saudi Arabia seeks to achieve. One of the studies issued by the American company stated that it is expected that artificial intelligence and solutions based on it will add $215 billion to the economy of the Kingdom of Saudi Arabia by 2035, representing an increase of 12.5% in the value of GDP (gross domestic products) (Alqudah and Muradkhanli, 2021) [9]. Most of the sectors that will achieve this GDP are the industry and public services sectors for which Saudi Arabia has ambitious plans in the future. After it made the Hanson Robotics "Sophia" the first robot with citizenship, it now plans to build a smart city "NEOM" that brings a new Future in the Arab world.

b) United Arab Emirates

The UAE is moving forward in the direction of a more advanced and active future. Therefore, it determined to change the government's work mechanism to keep in step with the rapid development in the world of technology (Schühly, Becker and Klein, 2020) [34]. The UAE has adopted a strategy for artificial intelligence "2031" launched in October 2017, through which it seeks to reach a future that keeps step with the

current changes through a technological path that goals to be the first in the world (Jabeen, Al Zaidi and Al Dhaheri, 2021) [24]. When the UAE accepted the "Artificial Intelligence Strategy" in 2017, which is the first of its kind in the region and the world, it was looking to the future without fear and representing the new stage on which all sectors depend to achieve a supportable future based on artificial intelligence in services and data analysis at a rate of 100% by 2031 (Bao, 2019) [14].

Bhargava, Bester and Bolton (2021) [15] studied that this strategy succeeded in leading the UAE to publish vital indicators on a global level, including digital competitiveness indicators. The UAE ranked 14th globally in the general ranking, ahead of countries such as China, Germany, France, Japan and Belgium, which is considered a distinguished achievement during the period afflicted by the repercussions of Covid'19 on the world's major economies (Schühly, Becker and Klein, 2020) [34].

In the view of Fouda (2020) [21], the UAE leads the Middle East region in smart city inventions. As the capital of UAE, Abu Dhabi leads the Middle East cities in the Smart Cities Index 2020 issued by the Global Competitiveness Centre and jumped 14 ranked in the Arab region and 42 globally, whereas; Dubai at 43rd globally and second in the Arab region (Jabeen, Al Zaidi and Al Dhaheri, 2021) [24]. In 2018, Abu Dhabi also won the award for the fastest-growing city among the best practices of smart cities in the world (Bao, 2019) [14]. One year before it was able to occupy first place in the Middle East in indicators of supportable cities, according to the most important source for evaluating the activity of smart cities worldwide. According to Bhargava, Bester and Bolton (2021) [15], the UAE is successfully using artificial intelligence applications in a wide range of fields, including medical diagnosis, stock trading, automated control, video game industries and Internet search engine software. In addition to its applications for improving agricultural production and to the great development in the Internet of Things (IoT) which allows management of factories and production processes are almost completely automated with the possibility of anticipating manufacturing failures and avoiding disruption of supply chains (Keezhatta, 2019) [27]. The industrial strategy in the next stage emphasises developing the industrial sectors rapidly. It includes industries related to clean and renewable energy (hydrogen production), machinery and equipment, electrical devices and products of FMCG (Food Manufacturing and Consumer Goods) (Jabeen, Al Zaidi and Al Dhaheri, 2021) [24].
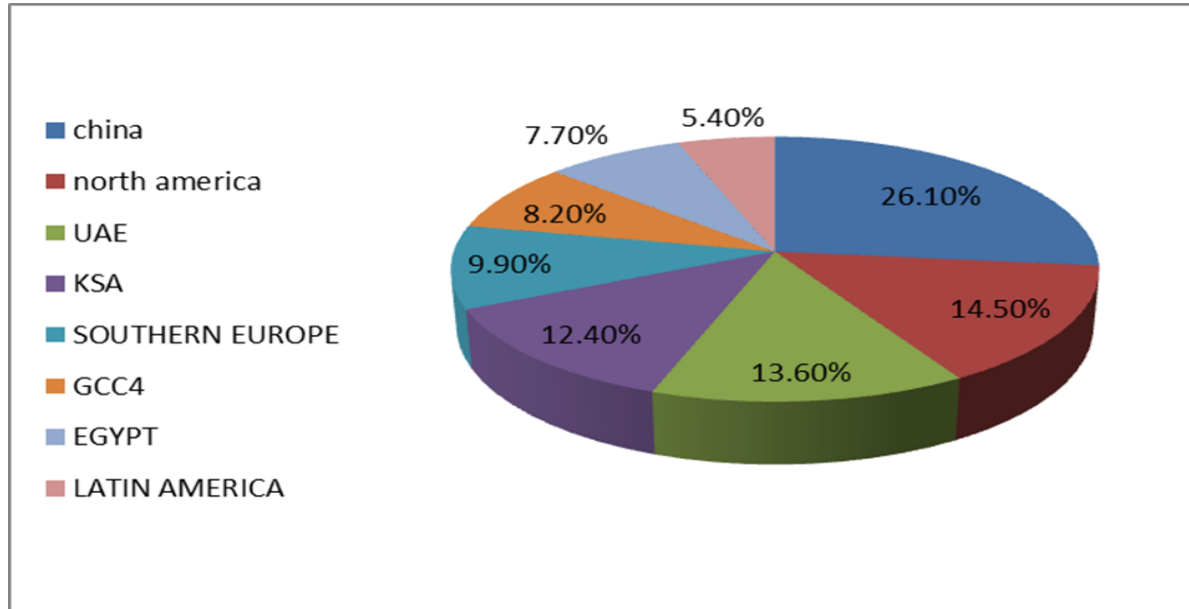
Fig2: contribution of Artificial Intelligence to GDP (Gross domestic product) by regions 2030.

c) Kuwait

In the research of Fouda (2020) [21], Kuwait ranked last in the Gulf and 54th globally among 172 countries, as part of the Government's Artificial Intelligence readiness indicator2020. The index is based on several factors, including governance, government vision, digital capability, resilience, ability to innovate, data provision, infrastructure, and human capital. As for the government axis, the index checks that the government must be willing to adopt artificial intelligence and ability to adapt and invent to do so (Ahmed, 2019) [1]. In terms of data and infrastructure, these tools need to be built and trained on high-quality, representative data, and the government needs the right substructure to be delivered to and used by citizens. According to the study of El-Jardali (2020) [20], Kuwait scored the lowest in vision (0%), the size of the technology sector (26.93%), human capital (35.55%), and the ability to innovate (39.51%). The Government Readiness Index for Artificial Intelligence is issued by the Oxford Insights Foundation, based in London, the United Kingdom, and the Centre for International Development Research (Bao, 2019) [14].

d) Egypt

The Egyptian state has placed the requirements of the Fourth Industrial Revolution at the introduction of priorities which was reflected on the policy of university education in Egypt (Keezhatta, 2019) [27]. Over only two years, faculties of artificial intelligence were established at the level of public universities, or departments and programs for artificial intelligence were launched in faculties of computers and information. The number of faculties and departments of artificial intelligence in faculties of public universities confirms the keenness and interest of the Egyptian state in keeping with the requirements of the Fourth Industrial Revolution (Shamiulla,

2019) [35]. Also, preparing graduates able to compete in the labour market and qualified for the challenges imposed by the Fourth industrial revolution.

e) Palestine

The train of digital transformation in Palestine took off, although; it was somewhat late or driven by the Corona pandemic. However, it started from where others ended and absorbed the lessons of adventurers Al Khatib et al. (2020) [6]. So, in the era of the Fourth Industrial Revolution and the dominance of the digital economy and applications of AI, machine learning, internet of things, big data, self-driving vehicles, smart cities, robotics and digital health, there is no room for hesitation (Frehat and Koni,2021) [22].

The Minister of Communications and Information Technology, Ishaq Sidr, affirmed that the government will spare no effort to contribute to improving the reality and the future in Palestine (Al-Najjar et al., 2021) [8]. As Al Khatib et al. (2020) [6] noting that work on government digital transformation is based on a comprehensive vision and looks to the future of the national agenda and policies, and meets the need of citizens, supports economic, entrepreneurial and community institutions and participates in planning and implementation. The Minister stressed the importance of promoting this sector for its role in supporting the economy and contributing to facilitating the life of the citizen and the advancement of the nation, and achieving sustainable development goal (Al-Najjar et al., 2021) [8].

Information and Communication Technology in Palestine: Challenging the Constraints and Dynamics of Power

For two decades now, stakeholders in Palestine have been promoting and disseminating new ICTs with the aim of creating economic opportunities (Khatib et al., 2020) [6]. In its broadest sense, this new technology involves the use of digital processing and telecommunications such as data networks, the Internet, computers, smartphones, mobile phones, satellites, and other wireless technologies to collect, create, analyze, store, process, and send information (Frehat and Koni, 2021) [22]. According to Khatib et al. (2020) [6], the policy paper addresses the difficulties Palestinians face in developing the ICT sector due to the ongoing Israeli military and digital occupation. While it outlines some of the challenges Palestinians face in Gaza, it focuses primarily on the Palestinian Authority's West Bank, where most Palestinian ICT initiatives originate. Al-Najjar et al. (2021) [8] explored the initiatives and efforts of the Palestinian Authority to develop the information and communication technology sector in Palestine through its cooperation with Palestinian expatriate capitalists as a means of overcoming, at least partially, the crippling Israeli restrictions. Although, the Palestinian ICT sector will not thrive as long as Israel continues its military and digital occupation of the Palestinians, this policy paper proposes recommendations to the Palestinian Authority in order to consolidate past gains and enable strategic investments in productive capabilities. Daqar and Smoudy (2019) [17] mentioned the statistics related to the challenges, Palestine ranked 123 out of 174 globally, and 14 out of 19 regionally on the ITU's ICT Development Index for

2017, with a significant difference from Lebanon (64th) and Jordan (70th). According to the Palestinian Central Bureau of Statistics, the Palestinian information and communication technology sector in 2018 included 677 registered companies employing 8,815 employees, that is,. less than 1% of the workforce and 4% of the nominal GDP. In 2017, it recorded a cumulative trade deficit of 200 million USD (Al-Najjar et al., 2021) [8].

Therefore, the underdevelopment of the Palestinian ICT infrastructure, despite the recent installations, is attributed to the Israeli ban on extending optical fibers to Palestinian homes, and the restriction of cellular use of 2G frequencies in Gaza and 3G frequencies in the West Bank (Daqar and Smoudy, 2019) [17]. Despite the first reports received on August 31, 2021, about the possibility of offering 4G frequencies in Palestine, the process of preparing the required infrastructure will take up to a year, and the Palestinians will continue to lag behind Israel, which provides 5G frequencies (Al-Najjar et al., 2021) [8].

From the Palestinian Authority's investment over the past two decades in the development of ICTs, we learn valuable lessons about ways to enhance the role of ICTs in the Palestinian economy, despite the continuing Israeli occupation (Daqar and Smoudy, 2019) [17] While Palestinian expatriate capitalists have an important role in the development of information and communication technology in Palestine, they are small partners. The Palestinian Authority, although it is a semi-government limited in its ability to enhance productive capacities and investment in Palestine, is leading the development strategy.

2.9   How can artificial intelligence be introduced to other Arab countries?

If the failure of Arab countries to join the successive industrial revolutions has led to industrial backwardness, then their failure to join the newly launched artificial intelligence revolution will lead to mental retardation. According to Fouda (2020) [21], if the Arab world wants to build supportable and wealthy Arab societies, we must prepare to receive the 4.0 industrial revolution and invest in human and artificial intelligence together, and from now on. In the view of Ahmed (2019) [1], Arab countries are currently technology importers, and some of them have a solid technological infrastructure comparable to that of developed countries. However, this situation can last if other Arab countries do not immediately prepare for the entry of the Fourth Industrial Revolution and invest in artificial intelligence technology (Keezhatta, 2019) [27].

3. Future Impacts of AI Applications in the Arabs Countries

This section describes about the future impacts of AI applications on Arab regions under the light of evidences.

• In the view of Alkhaldi and Altaei (2021) [5], artificial intelligence application can increase the productivity of agricultural lands, provide electricity through smart networks, and save water losses without any physical or manual handling of labour, which may increases the poverty. However, the positive impact is that AI contributes to increasing production and thus increasing people's share of global output which also enhance the economy of Arab countries.

- Artificial intelligence ending hunger and developing agriculture to control irrigation timing, water quantity, fertilization time, fertilizer type and quantity, and placing sensors to measure the proportion of humidity (Rafika, 2021) [32].

- Artificial intelligence also ensuring a healthy life for people of all ages and helpful in diagnosing diseases with high accuracy and proposing a treatment to the end using the Internet of Things (Alkhaldi and Altaei, 2021) [5]. For instance, they use small devices (such as a watch) to monitor the pulse pressure and alert the doctor if something bad happens; so, the development is continuing.

- Ensuring access to cheap energy sources for all. AI can be used to create efficient electricity distribution checks and reduce energy waste. According to Rafika (2021) [32], smart power distribution networks are one of the most important components of progress.

- Ensuring economic growth and increasing the size of the labour market to ensure a decent job for all. This is because artificial intelligence will contribute to creating new jobs and will also contribute to the disappearance of other jobs (Al-Shoteri, 2022) [11]. However, jobs that will disappear will be replaced by machines that are much more efficient than humans, which will increase productivity and economic growth.

- In Future, AI make cities, villages and all residential colonies liveable and safe by building smart energy transmission networks that follow up electricity consumption in such a way that reduces pressure on power stations to reduce breakdowns.

4. Conclusion
The world is moving towards clean energy and the oil age will end long before we run out of oil (the Stone Age did not end because we ran out of stones), and oil prices are expected to fall rapidly after 2030). Some Arab countries, such as the UAE, show great interest in the Fourth Industrial Revolution and the use of smart technologies. However, only a few scientific experiments related to artificial intelligence are led in Arab countries. Most of these experiments take place in the Kingdom of Saudi Arabia and the UAE. The UAE has made progress towards applying artificial intelligence techniques in various fields in the general government sector, to improve the level of government services and achieve increased productivity and cost-effectiveness. This is due to the leadership approach and the adoption of agile approaches towards policy development and implementation. Given the relative similarities in the developmental, cultural and economic context between many Arab countries, benefiting from the UAE model to adopt artificial intelligence policies can constitute valuable lessons for countries in the Arab region.

5. Recommendations
In this section, a few recommendations are given about the adoption of AI in other Arab countries.

- It is recommended to adopt national strategies and plans in the fields of science, technology and innovation, including clear governance structures that define the roles and responsibilities of various governmental and non-governmental agencies.

• It is recommended to adopt a quick approach to policy development to quickly overcome obstacles that will arise in governance and regulatory systems. The recommended policy tools are:

a) To develop plans to train employees and sharpen their skills, as well as adopt policies to attract talent.

b) To strengthen cooperative partnership frameworks that include academia, the private sector and international partners.

c) To implement AI governance and ethical management policies that ensure responsible use of AI applications and data in the public and private sectors.

d) To establish mechanisms for testing regulations and legislation to allow for safe experimentation and testing of artificial intelligence applications and other advanced technologies, in preparation for the adoption of regulations in the future.

e) To employ mechanisms to accelerate the adoption of artificial intelligence innovations in government agencies.

f) To establish cooperation platforms to transfer and exchange knowledge and experiences in the use of artificial intelligence and other advanced technologies.

g) To cooperate on research and development files of common interest, and benefit from the expertise and resources available in the region.

Therefore, with the belief that there is no unified approach or application for everyone about digital transformation, the experiences and expertise of the UAE provide a set of tools that enable policymakers to collect and exploit Arab regions, each according to their priorities and contexts.

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