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The digital economy and its impact on the international trade of Arab countries

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Abstract
This research examined the digital economy and Arab nations' international commerce. The research examined the digital economy and its differences from the traditional economy. The report also described the digital economy's goals and components, which shape its structure. The research used a comparative descriptive, analytical, and inductive technique to examine the Arab States' digital economy and its economic impact on international commerce. The research found numerous important conclusions, including that the Arab States' digital economy had little impact on international commerce. Goods, telecommunications, and IT services contributed 3.8% compared to 12.5% of foreign commerce. The average income in developing nations rose from 3% in 2011 to 12.5% in 2019. The Arab States did not make similar growth. The findings also showed that the Arab nations' digital transformation faces several problems, the most notable of which are the absence of investment in quick communication digital infrastructure and the lack of laws and legislation for this new economy. All of it affects their economy and international commerce.

Keywords: Digital economy – international trade – Arab State

Introduction
The massive explosion of interconnectedness and the increasing use of the Internet for a digital revolution has led to fundamental changes in the economic structure, dismantling the traditional systems and establishing a new technique known as the digital economy, the Internet economy, or the new economy. This has resulted in tangible effects in many sectors, such as business, administration, education services, healthcare, etc. Through these sectors, individuals and institutions can communicate with each other to select the most appropriate products and services, compare prices and decide on purchasing.

The use of digital platforms such as e-commerce and social media has also increased the volume of international trade, and e-commerce platforms and service markets contribute to promoting trade. This result in an unprecedent growing number of new subscribers and vendors, including enterprises, governments, companies, and individuals, can access international trade directly through a variety of websites and apps, ranging from major social media sites such as Facebook, Instagram, and more., and e-commerce giants like Amazon, Alibaba and mobile-based platforms such as app stores "iTunes" and "Android" as well as a system rich in specialized websites and e-stores that display a single brand.

These platforms' diverse and growing users contribute to the massive expansion of the range of products and services exchanged. Aside from their positive impact on trade, these platforms are likely to continue to increase the diversity of sectors directly involved in international trade as SMEs and individuals have increased new opportunities to sell their products and services to international markets. (Zawawi Yasser *et al*., 2017:7 - 8) [35].

The digital economy is moving at an impressive rate due to the doubled speed at which data and information are assembled, stored, analyzed, processed, and exchanged through digital platforms for business production, exchange, and development. The development of the digital economy in the Arab countries is therefore essential not only to stay abreast of global developments in the field of technology and to realize the needs of the times but also to address a lot of the economic and social challenges these countries face. Specifically, achieving inclusive and sustainable development is essential by enacting the appropriate legislation and laws for this new type of economy, providing rapid communications infrastructure, and being experts in software development to deal with the digital economy.

Disregarding these procedures may result in a lack of access to electronic data, products, and services and discourages the growth of various economic sectors and organizations. This results in widening the digital divide in Arab states, adversely affecting these countries' economies. (Qalul, Sofian and Talha, Al-Walid, 2020:9 - 11) [22].

Research problem

The economies of Arab states encountered many challenges in adopting the new economy, and these challenges caused a "digital divide" between Arab states and the economies of developed countries. The term "digital divide" has been widely used in recent years to illustrate the gap created by the information revolution and communication measured by how much knowledge people have about the digital economy's components. This digital gap has several reasons represented in fragile the infrastructure to establish this new type of economy, which requires the availability of digital technology and medium of communication through wire and wireless phone calling, satellite services, and material entities that many Arab states lack. Moreover, investing in new generations of telecommunication technics to support the economy and develop competitive capabilities. Additionally, most Arab States need to establish laws, legislation, and regulations that are flexible enough to keep up with current and anticipated significant technical changes, which is reflected positively in international trade by the Arab states.

Research Objectives

The objectives of this research are a set of crucial points that can be summarized in the following axes:

1. Defining the concept and characteristics of the digital economy, the differences between the digital economy and traditional economy, and what makes them unique.
2. Identifying the objectives and characteristics of the digital economy.
3. Explaining the elements involved in shaping the digital economy.
4. Addressing Arab realities in the digital economy.
5. Identifying the role of the Arab digital economy's contribution to international trade in Arab countries.

Hypothesis of research

1. Although many Arab countries have invested enormously in developing the digital economy sector to provide high-speed internet services and cut costs, it has not yet reached its full potential. Nevertheless, it remains a considerable challenge to increase the investment in the latest generations of high-speed communication technology, encourage innovation, and transition to a higher level of communication to encounter many challenges.
2. Digital Transition in Arab countries faces many challenges due to the digitization of government and private companies and a lack of finance and human cadres. The Arab States face different difficulties in digitizing, but the biggest is a lack of rapid communication infrastructure. As a result of the lack of legislation regulating this new type of economy, the lack of digital culture of community, and the lack of investment in new generations of communication techniques to deal with the digital economy. All of this has impact the economies of these countries and their international trade. This makes the sector's contribution to international trade more modest and limited.
3. The use of digital technologies in most Arab countries is more geared toward consumption and entertainment than business, innovation, and economic activities, which makes the digital economy's contribution to international trade less optimistic.

Research Methods

This research follows the comparative, descriptive and analytical approach. It describes the digital economy and its implications for international trade of Arab countries. It includes an explanation of the concept and features of the digital economy, and the differences between the traditional economy and the digital economy. The objectives and characteristics of the digital economy, indicating the elements involved in shaping the digital economy, and analyzing the realities of the digital economy in the Arab States. In addition to using an inductive approach to explore the contribution of the digital economy of these countries and its international trade**.**

The review of literature

The concept and features of the digital economy

The world is witnessing an era called the Fourth Industrial Revolution, characterized by unprecedented technical developments. In many areas such as e-commerce and artificial intelligence (technology that mimics human mind capability), genetic engineering, the Internet of Things, 3D printing, modern financial techniques or so-called "(Fintech) as well as blockchain technologies used in cryptocurrency transactions. This period is the fifth wave in what Russian economist Nikolai D. Kondratiev called the long economic cycle. It is a cycle developed by technical inventions and specifically depends on technological transformations and significant innovations that change processes and relations of production and relative portions of factors of production. After the influential discovery of electricity and steam engines, we are now experiencing a revolution in networks and ICTs, which are today the driving force behind the growth and structural changes in States' economies, as well as in people's lifestyles and relationships. (Schwab, Klaus, 2016) [24]. There has been a diversity of views on a standard definition of the digital economy. Perhaps one of the most prominent words on this concept is the following:

- The digital economy refers to "the continuous interaction, integration, and coordination between the ICT sector on the one hand and the national, sectoral, and international economy on the other to achieve transparency and all economic indicators that immediately inform all economic, commercial, and financial decisions in the State in a particular period." (Al-Najjar, Freed, 2007: 25) [4].
- The definition of the digital economy "is associated with the concept of the information society, which expresses a vision of a world where information constitutes the basis of the economy and human relations. This vision is embodied in a high-quality digital infrastructure that will enable this goal to be achieved in all areas of life." (Bushole, Fayzah, undated: 121).
- The digital economy "is the one in which most operations are based on information. It relies, in most cases, on the use of information and communication

technologies that have removed all restrictions and border barriers that prevent information, goods, and services and the movement of capitals from one part of the world at any time". As long as ICT is involved in many different economic activities at any given time, this type of economy is characterized by the use of ICT. The digital economy makes it possible to send and receive any amount of e-money instantly, anytime, anywhere. In the digital economy, all information related to cryptocurrency transactions is disclosed, transparent, and unbiased. According to AlBar, Adnan, Al-Muharabi, and Khaled (2019) [8], "the digital economy mainly depends on the human mind, while other elements like survival, lifestyle, and others are supportive rather than essential".

- Another definition of the digital economy is that "it is based on digital computing, uses information and knowledge, and inspires innovations" (AlZro, Hassan, 2006:13) [5].

From the above, it can be concluded that the digital economy, or electronic economy, is mainly driven by technological and informational advances that facilitate the growth and development of products and services, especially those that can be exchanged digitally on networks of information and, therefore the advantages of the digital economy: Integration of the State's economy into the global economy.

- Increasing international trade opportunities and market access.
- Developing relationships with suppliers, exporters, competitors, dealers, investors, banks, insurance companies, manufacturers, producers, government agencies, customs, taxation, and international organizations.

Digital economy vs. traditional economy

Some people might be curious as to what distinguishes the digital economy from the traditional economy, whether it is merely a technological transition or if there are fundamental differences between the concepts and components of these two economies. This table summarizes the key differences between traditional and digital economies based on multiple criteria, including markets, competitive constraints, structure, and source of value creation.

Table 1: Compares traditional and digital economies.

Criteria	Traditional economy	digital economy
Markets	Stable	Kinetic
Competition boundaries	National	Universal
Structure	Manufacturing in essence	Intrinsically Service/Informatics
Source of value	Raw materials and natural capital	Human and social capital
Production Organization	Large Production	Flexible production
Objective of Competition	Local	Global
Main technical engine	Mechanization	Digital
Source of competitive advantage	Cost reduction through budgeting	Innovation, quality, and adaptability
The importance of research and innovation	Between Low and Medium	Great
Relations with other companies	Single Performance	Cooperation and Superiority
Organization	Command and Control	Flexible and market-based
Market Changes	Slow and linear	Fast and unpredictable

Source: Adnan Al-Barr and Khalid Al-Muharabi (2019) [8], Digital Economics, King Abdulaziz University, Jeddah.

Objectives of the digital economy

The goals of the digital economy can be summed up in few terms, but they mean a lot to businesses, societies, and countries. It is verifiable that companies and institutions carry out the digital economy through information and communication technologies. These benefits include removing geographic, time, and structural barriers and improving the ability to manage cost constraints. All these objectives can only be accelerated by introducing the digital economy and continuing to develop it.

The characteristics of the digital economy

As part of the globalization phenomenon or today's economic system, the digital economy has many characteristics and qualities:

- The digital economy makes data and information easily accessible. For the digital economy to succeed and grow, individuals and institutions need to be able to participate in various websites and information networks. Infrastructures, such as telephone and electricity networks, and low-cost and paid services are necessary for effective participation in these networks. There are many factors to consider, including the availability of machinery, equipment, skills, education, training, financial resources, and electronic and plastic funds.
- Impact on competition and market structure. The use of information technology influences the degree and manner of competition. Nationally and internationally, the market structure varies according to how ICT is used.
- In terms of Macro-economic performance, ICT plays a vital role in increasing economic growth rates, capital investment, and domestic and international trade, and the Internet significantly influences the functioning of various business transactions and processes.
- Interactive: form of interactivity allows direct online contact to interact with the customer in a way like "face to face," although it can do so globally and with a broader audience. In recent years, merchants have started using the Internet to communicate information with their customers and improve the intellectual State of their organizations by increasing customer awareness, customer loyalty, customer confidence in online shopping, and selling products on the Internet to sell and evaluate. (Mukhtar, Elfatih, 2015: 268) [18].
- Influencing the well-being of societies, diagnosing economic problems in terms of causes and outcomes, and proposing ideal and scientific financial solutions, broaden the social impact of economic

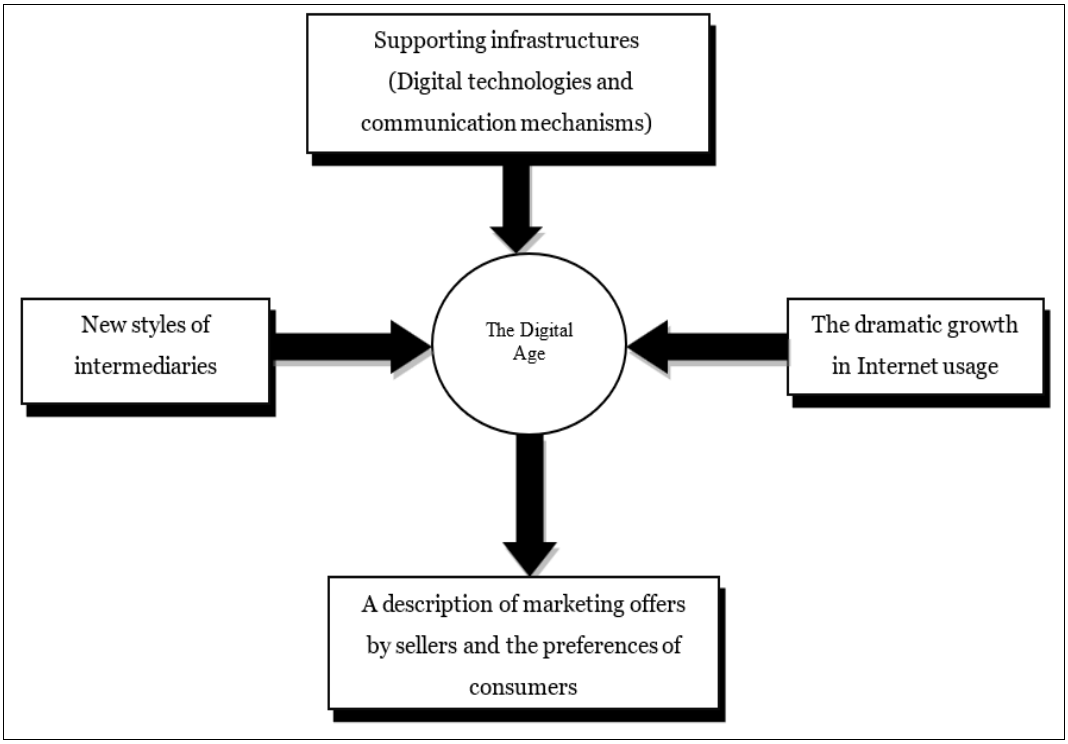
research at the micro and macro levels as it affects the well-being of the whole society in everything.

- **Diversity:** The digital economy offers a comprehensive and extensive collection of different products and services that meet the needs and desires of various segments of individuals and businesses. (Omar, Mohammed, Ja'ouni, Farid, 2012: 598) [21]. This diversity helps the consumer or the buyer to diversify his needs and allows the seller to diversify his production. It also leads to a diversification of the structure of international trade, which improves the position of the balance of payments. (Mukhtar, ElFatih, Idriss, Jaafar, 2014: 183) [19].

Digital Economy Design Elements

Many elements influence the new economy and play a crucial role in its emergence: modern technology, globalization, and movements of environment protection. We will discuss four main forces shaping the shape of the new digital age:

- Support infrastructure.
- The advent of the Internet
- New types or models of mediators
- Detailed information about the seller's marketing offers and their preferences by the consumer.



***Source*:** Researcher, adapted by Abu al-Naja, Mohammed (2008, Advanced Marketing, University House, Alexandria) [3]

Fig 1: Illustrates elements of shaping the digital economy.

1. Support infrastructures

Various digital technologies and communication mechanisms support e-commerce operations and activities and exchange e-commerce transactions. These infrastructure elements include telecommunications, telephone networks, satellite services, software, hardware, ancillary services, and trained and qualified personnel. However, it should be noted that many systems and devices we use today, such as laptops and data carriers, have become digital components that can be leveraged by new technology to make them work.

Continuous and increasing technological advancements have led to an increase in the number of devices and systems that work with digital information, which is made up of binary cells made up of zeros and numbers, which has made it easier to read books, dates, and sounds. Moreover, Process the images to be converted into binary digital streams. The circulation of these binary cells from one device to another requires communication and communication that has been achieved through communication networks. Much of the work currently being done on these networks is already underway, including:

- Interactive communications such as audio and video meetings.
- Distribution of documents.
- Integration with electronic business.
- Telephone connection.
- Access to web-based databases.
- Web pages for individuals or enterprises.

2. The emergence of the Internet

This network dates to 1969 when the US Department of Defense launched an information-sharing project with scientific research centers worldwide. University of California was the first to help develop this project, calling it the "Arpanet" (Amer, Asmahan, 2010:33) [6]. The Internet can be defined as a global network that connects networks around the world through telephone lines, satellites, or computer networks, enabling them to communicate with all types of users around the world using computer networks, satellites, and internet-connected devices. In addition, there is also a vast archive of information in the world of incredibly different shapes and sizes. The Internet can be applied in the following areas:

- E-commerce and e-business.
- Services offered to the customer, such as keeping information about his products.
- Support management information.
- Document management.
- Fictitious organizations.

The Internet offers many solutions, including banking, insurance companies, industry, retail, education, health, and leisure services. The network also provides many benefits:
Email: It is one of the most widespread electronic activities used by individuals, specialists, businesses, and corporations through their various actions, the size, and the evolution of information technologies used in their organizations. Many of us have one or more email addresses that send and receive messages worldwide. The most crucial feature of email is that messages can be sent to an unlimited number of addresses easily, quickly, and more cheaply than phone calls or faxes. It can be used from any computer or phone anywhere in the world, and all that is needed is an address.
Word Wide Web (WWW): This service facilitates the navigation, search, and retrieval of information within a network by providing access to both text and interactive elements such as audio, photos, films, and videos, which are divided and accessible, and the networked set of information is interconnected according to its themes through hyperlinks that facilitate horizontal navigation between pages. (Shatiba, Zainab, 2009:64) [25].
Electronic Data Interchange (EDI): It is a method of sending and receiving data over computer networks and smart devices in a way that allows them to run their future software to benefit from the results after processing. Consequently, a method of electronic data exchange is needed, as well as a set of standard models, software, and techniques to facilitate data exchange (Abdussalam, Ibrahim, undated: 116-119) [2]. EDI has helped consumers and business organizations communicate in all possible and desired forms and ways. According to recent surveys, many consumers use and evaluate information posted on the Internet when making important decisions such as choosing a school or university, buying a car and job, and making important investment decisions. (Abu al-Naja, Mohamed Abdel-Azim, op. cit.: 314) [3].

3. Different types of intermediaries

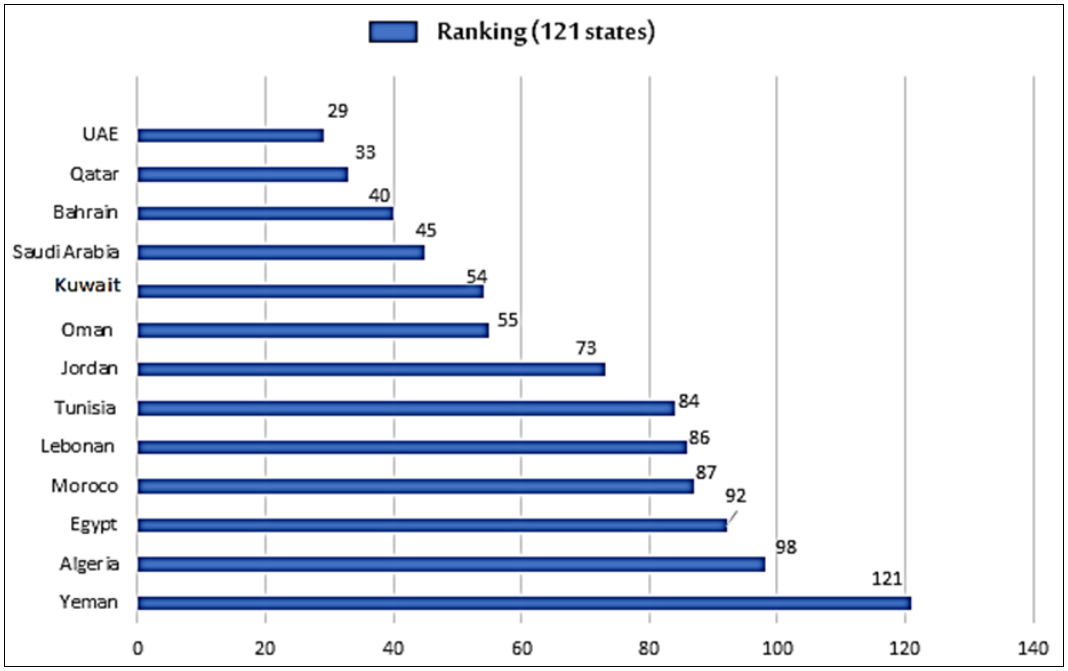
Dot-coms are internet enterprises that have sprung up due to modern technology. The growth of companies such as Yahoo and Amazon has impacted many traditional industrial enterprises and real-world retailers. COMPAQ Computer Company, for example, was affected by COMPAQ's efforts to sell computers through distributors and resellers. Dell, which has witnessed tremendous growth through the internet sale of its products, has abolished the services of traditional distributors, referred to as a new type of distribution intermediary, with this new type of online broker. Because of the rise of the new intermediation model and these new types of interaction, producers are forced to reconsider how they service their markets (Abu al-Naja, Mohamed Abdeladim, ibid.: 315-316) [3].

4. Offers developed by the seller and preferred by the consumer

Traditionally, industrial firms relied on stereotypes of their products, and their economic systems were based on them. In economic systems, companies and their activities play a central role, and these companies have dedicated their investments to creating a brand that gives them the advantage of profiling the market. Through their philosophy of product stereotypes, they look forward to demanding growth. These companies have relied on unmodified automated guidance and control systems to achieve economies of scale and operationalize that philosophy. In contrast, new economic systems are built around business-related information. The rapid development of the Internet and communication technologies has allowed companies to develop their capabilities to collect data on individual aspects of consumers, suppliers, and distributors, which has become the primary source of differentiation benefits.

The Reality of Digital economy in the Arab States

This section examines the realities of digital infrastructure that supports the digital economy. We discuss how prevalent telecommunications and information technology services are in Arab countries compared to the rest of the globe and how particular Arab governments fare in digital readiness. In this regard, several Arab States are attempting to keep up with global advancements in ICT and its new factors by growing and modernizing their economies to keep up with the rapid and successive developments in ICT. Several Arab countries have completed the conversion of their networks to digital systems, but they are still behind the worldwide average (Mansuri, Kamal and Khalifi, Issa: 57-58) [15].
According to the international experience and most studies, the digital economy can be maximized by increasing connectivity and digital readiness and protecting against several underlying adverse effects. To maximize the benefits of digital transformation, digital readiness requires integrating digital technology and users (individuals, businesses, and governments). As reported in a recent report on the digital readiness of countries in the world, the group of 13 Arab states is among the least digitally literate countries in the world compared to other countries. It illustrates a significant difference between the economies of the Gulf Cooperation Council and North Africa regarding overall digital readiness. UAE is the pioneer in the Arab region in the field of digital readiness and ranks 29th in the world out of 121 countries.



***Source*:** Soumitra Dutta & Bruno Lanvin (2019), The network Readiness index (2019)

Fig 2: Arab countries' ranking in Digital Readiness Index (2019)

Regarding the position of the group of Arab countries on the critical sub-indicators of the digital readiness index (technologies, use, governance, and impact), these countries seem to be withdrawing from the rest of the group of countries in the world, in particular in according to their level of technological maturity, i.e., H digital infrastructures. As we have seen in recent years, embracing the fourth industrial revolution, and using real-time capabilities to process big data, harness it for innovation, and create new value chains simultaneously is impossible on time. However, artificial intelligence and the Internet of Things can only be exploited with the development of fixed and mobile broadband communication networks, high-speed fiber optic Internet networks, and digital platforms for storing large amounts of data. Furthermore, a reliable and highly efficient power grid is crucial for developing the digital economy, as erratic power supplies and faulty power grids lead to inconsistent communication with information centers and data loss (Rumana Bukht and Richard Heeks, 2018) [23].

Digital economy applications heavily rely on a country's electricity grid since subscribers cannot access the Internet from a fixed device without electricity, and routers cease to operate without electricity.

While electricity systems in Arab states have developed significantly over the past two decades, generation capacity in some Arab states has not kept pace with peak load growth. As a result, countries like Lebanon, Iraq, and Somalia experience power outages almost daily. Several countries, such as Egypt and Mauritania, have Web-based gross generation capacity above 140% of maximum load, ranging from 115 to 140% in most of the Gulf countries, Jordan, Tunisia, and Algeria, where it varies between 115 and 140%. Electricity cuts last no more than two hours a year in most Gulf Cooperation Council countries, which is good and comparable to the average annual cuts rate in most developed countries. In other countries, such as Sudan, there is no electricity for more than five hours a month, Iraq receives electricity for about six hours a day, and Libya receives electricity for four or five hours a day, which is unacceptable compared to the Average of the System Average Interruption Duration Index (SAIDI) among Arab countries. Looking at some developed countries, the results show that most countries, except for the Gulf Cooperation Council (GCC), still need to catch up to the levels achieved in countries like Germany, France, and England. (https://databank.worldbank.org/reports)

In the telecommunications world, there are two main types of networks: fixed networks, which use copper wires and fiber optic cables to transmit data, and wireless networks, which rely on magnetic radiation from computers, mobile phones, and tablets.

Fiber optic cables are much better suited for data transmission than copper cables. Wireless networks generally use several technologies, and Wi-Fi technology is used in homes, shops, and offices because the range is limited, and subscribers can connect to a router (fixed device) connected to the Internet.

The fixed technology of second, third, fourth, and fifth-generation networks (5G, 4G, 3G, 2G) allows subscribers to access the Internet wherever this service is available. Table No. (2) shows the data download speed between different technologies. With this in mind, it can be seen that the data download speed with 4G technology has increased significantly compared to the data download speed with third-generation technology, so it makes sense. With the introduction of 5G technology, there will be a qualitative leap in the speed at which data can be downloaded once it becomes available in significant quantities.

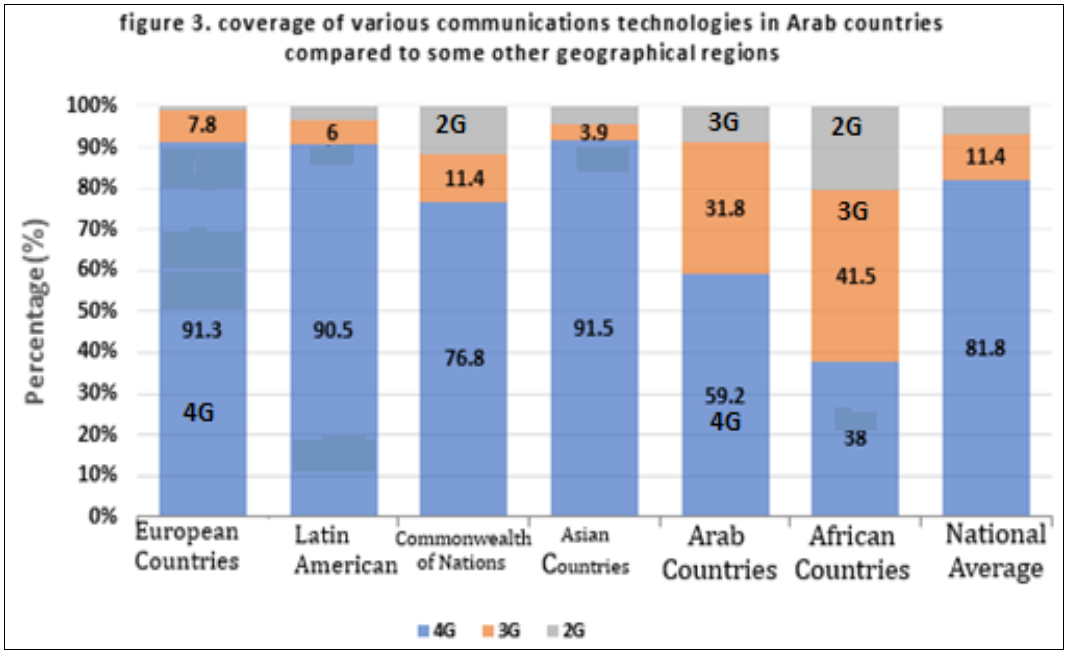
Table 2: Comparison of data download speeds for various mobile communications technologies and data download speeds (Mbps)

Technique	Maximum speed	Actual Speed
2G	0.3 - 0.1	0.1
3G	42.0 - 0.3	8.0 – 0.1
4G	979 – 150	90 – 95
5G	10.000 – 1.000	200 - 150

***Source*:** Download Speeds: Comparing 2G, 3G, 4G and 5G Mobile networks https:// kenstechtips.com

Figure (3) shows that 4G technology covers only about 59.2 percent of the Arab region. It is estimated that 31.8% of the area is protected by 3G technology, while the network does not cover the remainder or that the only technology accessible is second-generation technology. These levels are considered low compared to Europe, Asia, and Latin America, where fourth-generation technology covers more than 90 percent of the area.

These indicators highlight a digital divide between the Arab States and developed countries. As stated above, this is due to the lack of infrastructure that supports the establishment of this type of new economy. This calls for the need to expand investments in new generations of communications technologies in the Arab States to exploit the opportunities offered by these technologies to support the economy and develop competitiveness.



***Source*:** International Telecommunication Union.

Fig 3: Comparison of the coverage of various communication technologies in Arab countries with that in other regions.

The infrastructure is likewise considerably different from that of other new places. Internet speed is poor, and rates, while lower than others, remain exorbitant, with very few consumers having high-speed internet connection. Several Arab countries' Internet marketplaces have monopolies or entry hurdles, and high obstacles exist in markets that provide Internet infrastructure, limiting innovation across the Internet's whole value chain.

It is also worth noting that, compared to other regions, the adoption of broadband networks in the region's mobile phones is restricted, particularly in the burgeoning markets of East and Central Asia. Most Arab countries rely on copper cables to supply Internet service to end consumers, whereas Romania and Bulgaria have shifted to fiber-optic networks. The UAE and Qatar are the only countries that employ fiber optic systems to link their end consumers to the Internet, similar to how mobile phones use broadband. Fixed Internet line speeds in the Gulf are lower than the world average, and no country in the region offers Internet speeds equivalent to those on the international level. (World Bank report, 2018: 38-40) [33].

It is also critical for Arab countries to adopt rules, legislation, and regulations to reap the benefits of the digital economy's development. Making it more adaptable to present and projected substantial technological advances, some of which are no longer viable at a time when the economy's structure has altered and is heavily reliant on data and information. Several reports on the region show that administrative difficulties, legal limits, and a lack of trust in electronic transactions are among the most significant barriers to the development of the digital economy in Arab countries. (World Bank, 2018) [33].

A research paper by the world showed that the Middle East and North Africa region is lagging behind in creating a modern governance framework for the digital economy in a group of systems, including electronic signatures and documentation and protecting online transactions and data governance particularly in terms of lack of trust Particularly interested in consumer protection, particularly regarding the lack administering personal data and cybersecurity and regulations pertain to the responsibilities of the intermediaries who post information of third parties via internet (Lillyana Daza Jaller and Martin Molinuevo, 2020) [14].

The digital market organization of the region countries still in its early stages, where it is often controlled by laws not originally related the digital age. There are still some main gaps which limited the trust of the digital market and reduce confidence and increase the cost of transactions especially tasks which depend mainly on digital technics, (Bain & company, 2019) [7].

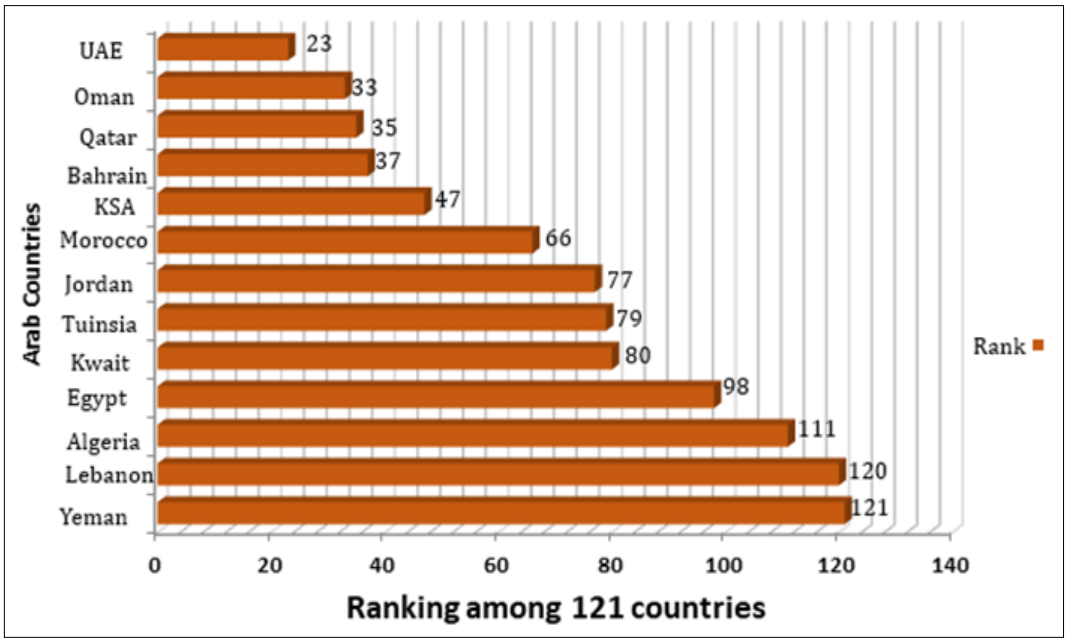
On the other hand, the 2019 Digital Readiness Index report identified a sub-indicator of the degree of regulatory adequacy in 13 Arab countries with available data. This indicator is derived from several components and sources, including a field survey conducted in 2016 and 2017 among entrepreneurs from different countries worldwide. This indicator consists of 6 sub-indicators:

1. An indicator of regulatory quality reflects the Government's ability to formulate and implement sound policies and regulations that encourage the private sector.

2. The Ease of doing business.
3. An indicator that reflects the ability of the current legal framework to adapt to digital business models such as e-commerce, participatory economy, modern financial technologies, etc.
4. An indicator of the quality of e-commerce regulations, especially as to whether a State has adopted legislation (or has a bill) in four areas: electronic transactions, consumer protection, privacy, data protection, and cybercrime.
5. Indicator of the degree of protection afforded by the social safety net to the general public against economic insecurity in the event of job loss and disability.
6. A composite indicator of the evolution of ICT's regulatory environment, measuring the availability and characteristics of ICT legal and regulatory frameworks. This indicator includes 50 sub-indicators covering four aspects: regulatory authority, regulatory powers, regulatory system, and competition framework.

Figure (4) illustrates the Arab States' global ranking regarding the availability of information on the appropriateness of regulations.

The figure shows that the UAE leads the ranking of Arab states in terms of legislation supporting the digital economy and the information and communication sector, followed by the Sultanate of Oman, Qatar, the Kingdom of Bahrain, and Saudi Arabia, while the rest of the Arab states are at the bottom of the world rankings. In general, the format reflects the relative change in the evolution of laws and regulations and the amount of effort required to develop those laws and regulations.



***Source*:** Sumitra Dutta & Bruno Lanvin (2019), The network Readiness index (2019)

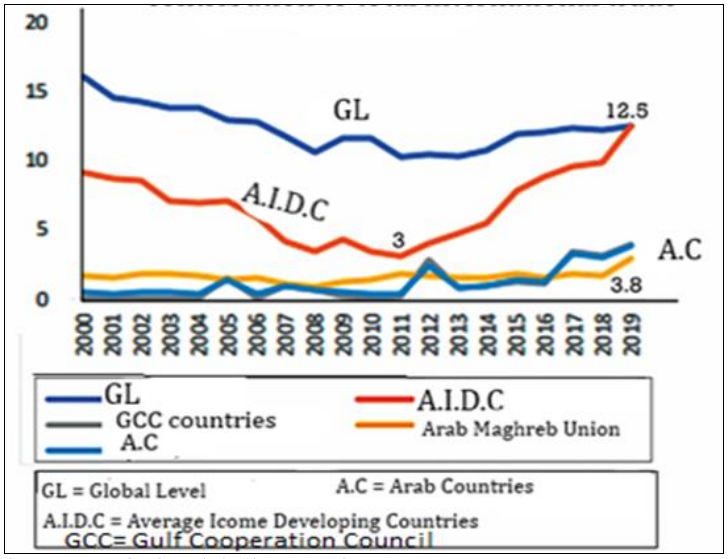
Fig 4: The rank of Arab States in the Index of Digital Economy Regulation in (2019)

Digital economy's contribution to Arab States' international trade

It's hard to account for and monitor the digital economy's different economic dimensions, making measuring the digital economy's financial contribution a challenge for all countries. However, some irregular statistics indicate estimates of the size of the global digital economy, estimated by the World Bank and UNDP to be 15.5 percent of the world's gross product in 2019. Individual estimates are also available at the country level, indicating, for example, that it accounted for about 9 percent of the United States GDP in 2018. (Abdelmonim, Hiba, Qalul Sufian, 2021:14) [22].

China's estimated size is $ 35.8 trillion, accounting for about (36) percent of GDP in 2019. (CAICT, 2020) [10]. The estimates provided by the statistics on the contribution of the telecommunications and information technology sector to GDP at the Arab States level indicate that the level of contribution of the digital economy to the GDP of the Arab States varies from the lowest level in Jordan to the highest level by a factor of about (12.2) percent in 2019. The United Arab Emirates and Bahrain follow the group with an estimated 8 percent contribution each, and Kuwait and Egypt, respectively, by (5) and (4.4) percent, while the proportion in the rest of the Arab States is significantly lower.

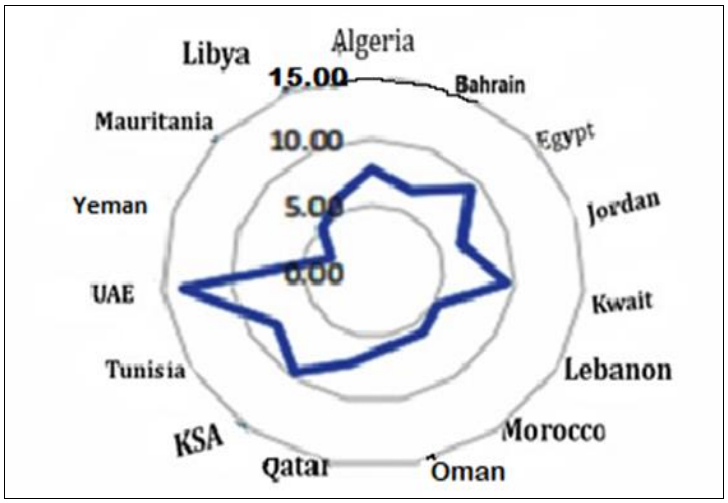
The economic contribution of the digital economy is also measured by the assistance of the communications and information technology sector's goods and services to international trade, with statistics from the United Nations Program on Trade and Development (UNDP) indicating that, globally, this proportion accounts for about (12.5) percent of total international trade in 2019. However, it remains modest for the Arab States, accounting for (3.8) percent of their international work. The Arab States have also been unable to catch up with other middle-income developing countries, which have significantly succeeded in raising the share of telecommunications and information technology exports in their total exports from about 3 percent in 2011 to about (12.5) percent in 2019 as a result of the steady development of digital economy activities in these countries. Figure (5) shows this.



***Source*:** UNCTAD, (2020), "Data Center"

Fig 5: The proportion of ICT commodities' contribution to total international trade percent (%)

The contribution of high-tech exports to commodity exports is another indicator of the level of development of the digital economy. In this context, available data indicate that the United Arab Emirates leads the Arab States in this index with an estimated share of 13.6 percent, followed by Saudi Arabia, Kuwait, and Egypt with 9.6, 9.5, and 9.4 percent, respectively. Figure (6) shows this.



***Source*:** WEF, (2020) "networked Readiness Index."

Fig 6: Exports of high-tech products compared to total exports of goods

Some Arab countries' investments in this sector have been directly affected by political and economic instability, ICT sector's contribution to international trade has been limited. It is noteworthy that many Arab countries, including Tunisia, Egypt, Iraq, Libya, Yemen, and the Syrian Arab Republic. Table (3) shows that the investment in telecommunications decrease significantly in many Arab countries between 2007 and 2015, except for Jordan, which has doubled its investment in the sector in that period, as well as the Syrian Arab Republic, (UN-ESCWA report, 2017).

Table 3: Investment in telecommunications in some Arab countries (2007 - 2015)

Country	The amount invested by the United States government in telecommunications (millions of dollars)								
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Jordan	31	90	164	301	295	127	107	329	650
Tunisia	76	99	287	966	181	222	130	114	0
Algeria	561	264	398	237	214	87	609	742	162
Syria	59	95	108	65	75	128	87	33	276
Sudan	478	207	357	478	382	343	208	301	0
Iraq	3.700	284	447	456	386	377	661	751	459
Egypt	1.908	1.414	1.791	2.113	980	832	685	1.066	1.079
Morocco	716	843	240	1.124	803	820	441	881	605

Source: World Bank database, 2016 [32]

Considering the digital economy's economic contribution through ICT exports in some Arab countries separately during the period 2007-2014, data from the World Bank for 2007 indicate that global exports accounted for (12.2%) of total international trade, while still limited and modest. It accounts for 0.03 percent in Egypt, 0.06 percent in Bahrain, (1.22%) in Lebanon, and (5.13%) percent of Morocco's total international trade, and in 2014 the proportion of global exports was (10.83%) of total international trade. While for some Arab countries, 1.04 percent in Lebanon, (1.71%) in Bahrain, (1.89%) in Jordan, and (2.71%) in Morocco and (2.84%) in Egypt's total international trade. This indicates that the digital economy's contribution to international trade in many Arab countries is disappointing and under-ambitious. The figures stated in table (4) indicated that, there are low export figures for many Arab countries, which indicates that the export structure of the sector is weak, and that the Arab region is an importer of ICT products.

The development of ICT usage in the Arab world is one of the biggest challenges. This can be attributed to several factors, the most important being the decline in investment in new generations of communication techniques designed to support the economy and develop competitiveness. As a result of the low prevalence of fourth-generation telecommunications technology and the high cost of broadband services, broadband services are less widely available than traditional telecommunications methods. In addition to a decrease in download speed, many parts of the broadband value chain remain closed to competition. For instance, the Morocco region, have yet to open their markets to private Internet service providers, and there are middle-sized information technology companies in Morocco, Algeria and Tunisia ,however, they are not allowed to provide high-speed Internet services to the end consumer based on their infrastructure due to the reliance on old infrastructure, the Arab region's broadband infrastructure remains dominated by state-owned companies, mostly overworked and dependent on old technologies. In turn, this negatively impacts the country's international economy and trade. Several Arab countries need laws, legislation, and regulations to keep up with significant technical changes, which benefit their international trade. (World Bank report, 2018:43 – 44 adapted) [33].

Table 4: Some Arab countries' ICT exports (2007 - 2014)

ICT exports of total merchandise exports								
Countries	2007	2008	2009	2010	2011	2012	2013	2014
Jordan	6.88	3.77	1.56	1.29	1.47	1.61	1.39	1.89
Bahrain	0.06	0.11	0.39	0.26	0.57	1.44	2.39	1.71
Lebanon	1.22	1.14	2.86	7.11	0.95	0.65	0.87	1.04
Egypt	0.03	0.34	0.17	0.14	0.23	0.24	0.42	2.84
Morocco	5.13	3.24	4.12	3.77	3.26	3.08	2.87	2.71
World	12.20	11.27	11.97	11.79	10.69	10.55	10.48	10.83

***Source*:** World Bank database, 2016 [32]

Table 5: Shows the status of telecommunications companies in the Middle East and North Africa region.

Company	Status
Maroc Telecom	Privately held company (State-owned30%)
Algeria Telecom	State-owned enterprise
Tunisia Telecom	State-owned enterprise (private owns 30%)
Libyan Telecommunications	State-owned enterprise
Telecom Egypt	State-owned enterprise (listed in the stock)
Jordan Telecommunications	Privately held company
Iraqi Telecommunication and Post Company	(State-owned enterprise
STC	Owned by 70% Public Investment Fund

***Source*:** World Bank Report, 2018 [33].

In most Arab States, SMEs have a modest economic impact due to their weak links with international value chains, many of the products of such enterprises in the Arab States are local market oriented. Therefore, it contributes modestly to economic growth, modern technology, and knowledge transfer. However, the average Arab contribution to GDP ranges from 30% in Gulf Cooperation Council countries to 80% in Egypt and Lebanon, (Nasr, Sahar, and Pearce, Douglas, 2012) [20]. In international markets, digital transformation helps SMEs expand their market share and access a diverse market, allowing them to gain technical and regulatory knowledge and develop their innovation methods from more developed markets. Earlier this year, the McKinsey Global Institute released a report in which it surveyed 4,800 businesses in 12 countries, concluding that companies using the Internet for business jobs grew twice as high as those that did not use the Internet. (Mckinsey Global Institute, 2011) [16].

These companies may not realize digitalization automatically due to limited digital knowledge, inadequate infrastructure, lack of finance, and regulatory constraints. By improving the business environment, providing easier access to finance, improving education and skills, encouraging competition, and providing incentives, these enterprises can become part of the international value chain and develop new business models. The lack of funding and the absence of effective electronic payment systems is one of the significant obstacles to the development of the Arab country's digital economy. This is due, in particular, to the lack of competition between banks and the concentration of banking activity in a few of them, which is one of the main reasons why banks prefer big customers and discourage lending to SMEs, innovators, and promising entrepreneurs.

Many Arab States lack incentives for developing financing instruments that distribute risks acceptable among their clients, such as financial leases, debt purchases, private

equity funds, and risk capital, due to the overall regulatory framework in the banking sector. According to some estimates, this has resulted in a market failure and a lack of financial inclusion. The economic and investment needs of SMEs in the Arab States are relatively more dependent on internal sources, with around one-third of those businesses having difficulty accessing finance compared to one-quarter of those in emerging market countries.

On this basis, there is a need to reform banking legislation in the Arab States towards risk protection, encourage the creation of innovative financing formats, and allow the emergence of non-bank financing institutions based on modern digital finance techniques and offer digital payment systems. Moreover, it employs the widespread use of smartphones in Arab countries as tools for innovation, business launches, and opportunity creation. This aimed at increasing financial inclusion and providing conditions for the development of e-commerce.

At the international level, e-commerce is of great importance because many of the services that take place at the international level have become easy to do through e-commerce. Trade across countries has been greatly facilitated by the availability of multiple means for electronic commerce, especially electronic transmitters, the Internet, and others. By extrapolating the definition of e-commerce and the tools it relies on, it is clear that e-commerce methods have benefits in international trade. The use of e-commerce tools and the possibility of delivering many products electronically will significantly facilitate international trade. Some products can be provided by electronic means, the outcome of which is to earn more time and economize many shipping expenses. It is hoped that international trade in goods and services in electronic form will grow and expand significantly. Information products such as logical entities (information programs) and auxiliary services will help in this area so much that they will make international trade as if it were taking place within a single State.

Many aspects of international trade can be facilitated by electronic commerce. This has led, for example, to the widespread use of e-commerce tools by customs administrations at the international level and, in turn, to a substantial improvement in the facilitation of the international trade process. E-commerce tools facilitate tariff assessments that amount significantly at the international level. Estimating tariffs requires many documents and administrative steps, all of which have been greatly simplified by the use of e-commerce tools that have helped speed up access to the global markets at a tremendous speed and with minimal expenditure. (Yahyaoui, Naima, and Youssef Mariam, 2017:182 - 183) [34].

At the Arab level, e-commerce is a promising sector that can benefit from the growing use of digital technologies. E-commerce transactions in the Middle East and North Africa region, comprising Arab countries, were valued at US $8.3 billion in 2017, with an annual growth rate of 25 percent. Electronic services have flourished in the economic and social sectors due to the use of this technology, but the sector's steady growth efforts still need to be stronger. ICT is the essential infrastructure for establishing e-commerce and completing various e-businesses, which is why Arab States rank highly in the ICT index globally. Table (6) shows the ICT indicator.

Table 6: ICT indicator

Country	Regional rank	Global rank
Bahrain	01	31
Qatar	02	39
United Arab Emirates	03	40
Saudi Arabia	04	54
Oman	05	62
Lebanon	06	64
Jordan	07	70
Kuwait	08	71
Tunisia	09	99
Morocco	10	100
Algeria	11	102
Egypt	12	103

***Source*:** International Telecommunication Union 2017

From the table above, Morocco countries and North Africa ranked last according to the indicator of the information technology and worst telecommunications in the Arab state and the world. This indicates that the concerted efforts by these countries did not meet the required level. Moreover, the use of digital technologies in these countries is derived by consumption and entertainment more than the search for new valued chains or innovation. Thus, the contribution of the digital economy in the international trade for these countries very limited and below the desired. The regional cooperation and creating incentives to build digital infrastructures and establishing regional networks and access points to them and linking the networks through borders particularly in distant areas and low economic area and forming partnership between multiple people who have interests in these countries, all these result in great economical benefits on collaborative countries. Not only form the achievement and availability of investment but also from the increasing of attractivity of the region for investment and activate the trade exchange between these countries and the outside world and contributing of the region to international digital economy, (UNESCWA, 2019) [28].

Conclusion

This study examined the digital economy and its implications for international trade in Arab countries. The idea and characteristics of the digital economy and the differences between digital and traditional economies have been studied throughout the research. The objectives and features of the digital economy were specified, as well as the variables involved in its formation and the reality of the digital economy in the Arab States. In the course of the research, it turned out that Arab countries are trying and making efforts to develop the digital economy sector to keep up with the rapid and progressive developments in this sector. However, it is essential to note that these efforts are lower than those recorded globally and lower than the efforts of middle-income developing countries in international trade. The Arab States' overall contribution to global commerce for information and communication technology goods and services is 3.8%, compared to roughly 12.5% for the world average.

In this context, Arab states have failed to make inroads into the middle-income category of developing countries, which raised their proportion from 3% in 2011 to almost 12.5% in 2019. The study also discovered that political and economic insecurity in some Arab countries had limited the

contribution of the ICT sector to international trade, which is undesirable, except for the GCC countries, which have made significant contributions, particularly in the export of high technology.

The research also revealed that the development of the use of ICTs in the Arab world faces several challenges, the most important of which are the low prevalence of 4G telecommunications technology, the high cost of Internet access via broadband services, and low data download network speed. Broadband infrastructure also continues to be dominated by state-owned companies that rely on legacy infrastructure (copper cable) rather than sophisticated digital fiber optic infrastructure, negatively impacting their economies and their international trade. In addition to all the above, developing laws and legislations and regulation in the Arab countries is another major challenge that make these countries accommodate the rapid technical transitions and contribute to the international trades of these countries.

Findings and recommendations

First: Findings

- Through the study, the researcher explained the weakness of the digital infrastructure of Arab countries as 4G technology covers only about 59.2% of the Arab world, around 31.8% is covered by third-generation technology, and the remaining area has no network coverage, or the only technology available is second generation technology. These levels are low compared to the average level of service in European, Asian, and Latin American countries, where fourth-generation technology covers more than 90 percent of the area. These indicators indicate the weak competitiveness of the Arab states and difficulty competing in global markets.
- The contribution of the digital economy to the international trade of the Arab States is modest and limited. The communications and information technology sector's goods and services to the total international trade of the Arab States was modest at 3.8 percent in 2019, compared with about 12.5 percent for the global average. In this context, the Arab States were unable to register progress in the middle-income group of developing countries, which was able to raise this proportion from 3 percent in 2011 to about 12.5 percent in 2019.
- Arab countries face many challenges when it comes to implementing digital transformation. The main obstacle is the lack of investment in the infrastructure for fast communication, as represented by investments in advanced infrastructure based on optical fibers instead of relying on the old infrastructure represented by copper cables. As a result of the lack of regulations and legislation necessary to deal with the new type of economy in the Arab region, broadband infrastructure is still closed to competition. It is subject to the dominant position of state-owned companies that rely on old infrastructure and the lack of regulations and legislation needed to deal with this new kind of economy. Many countries experienced political and economic instability, negatively affecting their economies and international trade.
- The use of digital technology in many Arab countries is primarily driven by consumption and entertainment rather than the creation of new value chains or innovations, making it difficult for the digital economy to contribute significantly to international trade in these countries.
- The GCC countries have made various contributions to ICT development and high-tech exports.
- The economic impact of SMEs on improving the competitiveness of Arab economies and transferring modern technology and knowledge is modest, despite their average contribution to the Arab State's GDP ranging from 30% in the GCC countries to more than 80 percent in countries such as Egypt and Lebanon. According to estimates available for the Arab States, SMEs rely on internal sources of financing, and about one-third find it challenging to access finance, making their contribution to international trade modest and limited.

Recommendations

1. Developing digital infrastructure in Arab countries by expanding investments in new generations of telecommunications technologies, especially 4G technology and high-speed Internet services, to support competitiveness and competition in global markets. Public-private partnerships could also be established to expand digital infrastructure investments.
2. The need to improve the institutional structure by enhancing the business environment and the ecosystem associated with the digital economy, in particular by reviewing and updating laws and regulations that ensure conditions for competition and monopoly prevention, especially among Internet broadband providers to provide a supportive business environment and stimulate innovation for progress in Arab States' economies and external trade.
3. Arab countries should allocate appropriate budgets to SMEs by reforming banking sector legislation to create innovative financing formulas that promote SMEs to increase financial inclusion and create conditions conducive to the development of e-commerce, contributing to these countries' international trade.
4. Work to forge partnerships among the Arab States to create associated digital infrastructure, establish regional networks and points of access, and cross-border link networks, especially in remote and economically disadvantaged areas, to achieve regional cooperation and increase the region's attractiveness for investment, to stimulate trade between them and to increase the region's contribution to global trade.
5. Arab countries should redouble efforts to move from a situation where modern digital technologies such as smartphones are used for personal purposes in entertainment and social communication to tools for innovation, business launches, and economic opportunities at the local and international levels.

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