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DIGITAL TRANSFORMATION IN THE MIDDLE EAST: DIRECTIONS, OUTCOMES AND CHALLENGES[5]

The article is focused on understanding the features of digitalization in the economy of the Middle East countries. Since digitalization has become a global trend, in which countries are being drawn at various speeds and degrees, it is important to understand and systematize the evolution of this process in different regions. In the Middle Eastern digitalization has been embodied in a number of sectors, industries, productions and activities of the region. This process is unfolding based on existing prerequisites - both regional and global. It is becoming increasingly important for the countries of the region, as it can significantly enhance the resilience of their economies to external challenges. The authors concluded that digitalization in the Middle East lags behind developed countries, but at the same time, is going on the same path as at the global level.

Keywords: Middle East; GCC; Digitalization; Digital Economy; Digital State
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1. Introduction

The countries and regions of the world today constitute virtually a single economic organism. The success of the functioning of this organism in any sphere, including the digitalization of the economy, depends on many factors and every participant, i.e. every country, without exception. The implementation of digital elements in different countries, their quantity, their interconnectedness in the system and the interaction of national digital systems at the regional and global levels expand the global perspectives and effects of digitalization as a whole, creating a synergistic effect.

Digitalization of the economy nowadays appears as an object and subject of research by many scientists and experts (Aidrous, Asmyatullin, Glavina, 2021). The content, elements, directions, role, geography, efficiency and prospects of digitalization remain the subject of scientific debate. All countries are at different stages of digitalization depending on the resources available to the country (Digilina, Lebedeva, 2020). The effects and scope of digitalization also vary (Asmyatullin, 2021). Thus, states, including Middle Eastern countries, have the opportunity to design and implement digitalization programs based on their capabilities and objectives (Digital Economy, 2022).

The Middle Eastern states, mainly the Gulf Cooperation Council (GCC), which have already joined the global innovation process through manufacturing and logistics (Shkvarya, et al. 2019), are now voicing their intentions not only to form the foundations of the digital economy, but also to catalyze this process (Melanina, 2020). This research explores the ways and possibilities of realizing this goal and the achievements of the Middle Eastern countries in the digital sphere in comparison with global trends.

2. Methodology

The theoretical basis of the study was formed by the works of Russian and foreign scientists, whose object of study was the digitalization of the economy and trade, the development of digital infrastructure and the massive growth of its application. The statistical basis was data from the UN Conference on Trade and Development. The historical, statistical and comparative methods used by the authors in this article making possible to identify the common and special features in the development of digitalization in the world and in the Middle East region and to provide a scientific justification for the stages of these processes.

The study is based on UNCTAD data for 2000-2022, as UNCTAD has been maintaining international statistics on the digital economy and trade since 2000. Data for the 2019-2022 Inclusive Internet Index are also used.

3. Results

The Middle East as a component of the world economy is experiencing all those transformations that are inherent in the global system as a whole (Krylov, Fedorchenko, 2015).

We divide the preconditions for the development of digitalization in the Arab world into two blocks: global and regional. Let us consider the first one. By global preconditions we mean, firstly, the creation of the World Wide Web (Internet) at the end of the 20th century; secondly, the sharp increase in the number of calculations per second (in the same period); and, thirdly, the combination of these two factors at the turn of the century - mobile Internet provided an opportunity to actively create, develop and use digital infrastructure in all spheres of life of the world and individual countries on the basis of the rapid development of ICT (Shkvarya, Hailing, 2021). Throughout this period, research on this process has been carried out more as specific developments that have received little dissemination (Nureev, 2018).

Nevertheless, technological development has created the technical and organizational conditions for remote access and control of economic, social, technical, educational, administrative and other processes in 2000-2018. On the other hand, the growth of competition and the objective process of unbalance in the world markets made it necessary to realize these conditions. The peculiarity of this stage was the use of digital capabilities along with traditional ones.

Finally, the global COVID-19 pandemic in 2019-2020 has significantly catalyzed the implementation and use of digitalization, which has become not just a fashion trend, but a real development factor. States and economic entities, primarily entrepreneurs, are looking for new ways to use high technologies, actively pushing developers to improve the most in-demand solutions. It was the pandemic that allowed – in the context of lockdowns – global economic players to reduce losses, to realize positive effects and thus to support economic systems.

Therefore, the process of digitalization in the world has gone through 3 stages of its development (see Table 1).

Table 1. Stages of digitalization development in the world

Period	Main features
Stage 1: second half – last quarter of the XX century	Emergence of technical capabilities for digitalization. Development and implementation of digital infrastructure based on the widespread use of ICT
Stage 2 (pre-covid) – 2000-2018	Virtualization of social, economic, technical, administrative and other processes along with traditional methods.
Stage 3 (post-covid) – 2019-ongoing	Significant acceleration and development of digitalization in quantitative and qualitative aspects. Formation of digitalization as an integral and comprehensive system affecting all spheres of life of states, enterprises and citizens.

Source: created by the authors.

All countries of the world and all macro-regions are involved in the process of digitalization to varying degrees. Thus, according to UNCTAD, only a few countries are currently creating advanced technologies (UNCTAD, 2023). These are, first of all, the United States and, increasingly, China, which is vigorously pursuing and financing digital transformation in the economic and social spheres.

According to UNCTAD experts, the market for 11 advanced technologies is currently estimated at $350 billion, and according to UNCTAD projections, it could grow to more than $3.2 trillion by 2025. The United States is the leading supplier of the most advanced

technologies, as it is the home of major cloud computing platforms. Chinese developers of fifth-generation (5G) mobile communications, drones and solar photovoltaic systems also stand out. It is noteworthy that from 30 to 70% of patents and publications for each of the technologies are also in the United States and China (UNCTAD, 2023).

Thus, digitalization is one of the most important and sustainable trends in the development of the modern world economy, which has become significantly more relevant with the global coronavirus pandemic (see Table 1), and, according to our estimates, in the short term, this qualitative evolutionary leap will cover most aspects of life in all countries of the world considering the remaining digital divide.

However, what are the role and the place of the Middle East countries in the global digitalization process? The digitalization process in Middle Eastern countries has its own pronounced specifics, which are connected with the peculiarities of this group of states (significant population growth, large reserves of strategic natural resources, the need to transform the national economy in the context of the energy transition, etc.). These and other peculiarities set urgent tasks for the respective states to stabilize the dynamics of GDP production, diversify the economy on a modern basis and continuously create new and highly paid jobs for the population, especially for the young.

On the other hand, the large number of young people in Middle Eastern countries who know the opportunities of the virtual world, including the economy, and who are usually well-educated (Aidrous, Asmyatullin, Glavina, 2021), provide not only the need, but also the opportunity to "digital transition" in these countries and, on this basis, to the creation of attractive prospects for digitalization.

Indeed, among the positive aspects of digitalization is the possibility of upward vertical social mobility, which can certainly be seen as a means of stabilizing the social sphere of the state as a whole.

The research conducted on digitalization in the Middle East suggests that the process of digitalization in this region is not only taking place, but is also assessed by experts as very active and effective. In this regard, it is worth noting that back in 2017 Saudi Arabia was among the largest digital economies in the world (Shkvarya, Frolova, 2017).

However, this group of countries has a number of specific characteristics in the sphere of digital economy development stages. Some of them, in our opinion, can be considered regional prerequisites for the development of digitalization.

In the countries of the target group, satellite television began to spread in the early 1990s, and then in 1999-2000 Internet services were launched, and the Internet was thus widely developed, especially among young people. Since the beginning of the XX century, the Internet has become a fact of life, and in 2003 at least 4% of the population (about 11 million people) in Middle Eastern countries used the Internet (Solovieva, Korenevskaya, Lebedeva, 2020).

Thus, the last decade of the twentieth century can be seen as the first stage of digitalization spread in the countries of the region.

The XX century showed a qualitative deepening and quantitative expansion of digital capabilities in the Middle East. A major and perhaps even fundamental role in this was played transfer of technologies for the development of high-tech and innovative spheres of the Middle East countries (Digital Economy, 2022). As a result, these countries became importers of high-tech goods, as well as high technologies themselves.

As can be seen in Table 2, in 2000-2005, Middle Eastern countries' imports of high-tech goods were smaller in volume (and grew at a slower rate) than those produced by medium-skilled workers and knowledge-intensive industries. The latter group, according to UNCTAD data, is represented mainly by engineering products - agricultural products, machinery, food production machinery, pulp and paper industry equipment, steam generating boilers, etc.

Table 2. Middle Eastern countries imports of medium-skilled and knowledge-intensive manufacturing products and high-tech industries products in 2000-2020, USD million in current prices at current exchange rates

	2000	2005	2010	2015	2020
Medium-skilled and knowledge-intensive industries	56335,6	113181,4	52375,2	147931,0	4199537,1
Highly skilled and high-tech industries	50979,3	97441,3	90175,8	92988,3	5463331,5

Source: based on Technology and Innovation Report, 2021.

The statistical data in Table 2 confirm that, in general, the volume of imports of medium- and high-tech product groups by the countries under consideration has increased by 102.8 and 143.9 times respectively over a quarter of a century. This stage also corresponds to the first stage of the global development of the digital economy (see Table 1).

Thus, from the beginning of the 21st century, the quantitative and qualitative growth of imports of both groups of goods began on the basis of the actualized tasks of transformation of the national economies of the Middle East countries, primarily the GCC, and of the attempts of this group of states – often successful – to start their own high-tech, at least assembly, production (Digital transformation, 2023), which allows us to characterize this period as the second stage of the development of digital opportunities. However, the global financial and economic crisis of 2008-2009 changed this trend, and 2010 showed a significant decline in medium- and high-tech imports by Middle Eastern countries. This leads us to the conclusion that the most characteristic feature of the Middle Eastern countries remains not the development, but only consumption and implementation of high-tech and, in particular, digital technologies.

At the same time, at this stage, the further spread of Internet use, the increase in the number of users, and their involvement in social networks were also registered (see Table 3).

International statistics note that in 2020, the Middle East recorded a 5227% growth in Internet usage relative to the level of 2000, and the global growth in Internet usage – 1266% (UNCTAD, 2023). This situation was largely influenced by the creation of digital development strategies by Middle Eastern countries (see Table 4) and by their gradual implementation.

Table 3. Internet diffusion in the Middle East

Countries	Population at the beginning of 2021, persons	Users, December 2000	% of the population (penetration)	Internet, % of users
Bahrain	1748296	40,000	97.7	0.9
Iran	85028759	250,000	91.8	39.3
Iraq	41179350	12,500	59.6	12.3
Israel	8789774	1,270,000	79.7	3.5
Jordan	10269021	127,300	84.7	4.4
Kuwait	4328550	150,000	98.3	2.1
Lebanon	6769146	300,000	81.9	2.8
Oman	5223375	90,000	76.8	2.0
Palestine	5222748	35,000	64.8	1.7
Qatar	2930528	30,000	104.3	1.5
Saudi Arabia	35340683	200,000	90.1	16.0
Syria	18275702	30,000	46.5	4.3
UAE	9991089	735,000	103.3	5.2
Yemen	30490640	15,000	25.9	4.0
TOTAL for the Middle East	265587661	3,284,800	75.2	100.0

Source: based on UNCTAD, 2023.

Table 4. Digital development programs/strategies in Middle East countries

Country	Program / Strategy	Year of adoption
Bahrain	National e-government Strategy	2010
Israel	The Digital Israel National Initiative: The National	June 2017
	Digital Program of the Government of Israel	
Jordan	e-Government Strategy	2014
	Jordan National Information and Communications Technology Strategy	2013
Iraq	Government of Iraq e-Government Strategy	2007
Qatar	National ICT Plan. Advancing the Digital Agenda	2010
	e-Government 2020 strategy	2015
Lebanon	E-Government Implementation Plan	2012
UAE	Fourth Industrial Revolution Strategy	2017
Oman	e.Oman Strategy	Not specified
Turkey	Bilgi toplumu stratejisi ve eylem plani	2014
	National e-Government Strategy and Action Plan	2015

Source: created by the authors.

Most of them were adopted between 2000 and 2018, i.e. at the second stage of digitalization according to the classification we have adopted. However, not all countries have developed such programs to date.

Middle Eastern countries are able to transform digital data into concrete business opportunities. However, they are still at a disadvantage when it comes to added value creation.

As a result, according to international experts, the countries in the considered group are currently at an average level in terms of some digitalization indicators, such as 5G coverage (World Population Review 5G, 2023).

At the same time, there is a significant growth of indicators. For example, Bahrain and the UAE lead the way in terms of e-government; both countries have a fairly high digital readiness index, with the UAE also having a good innovation index while Bahrain's is relatively low (see Table 5).

Table 5. A number of indicators of digital development in GCC countries

Country	Digital readiness index	Innovation index	E-Government index
Bahrain	5,1	34,67	0,8116
Qatar	5,2	37,9	0,7132
Kuwait	4,2	36,1	0,7388
UAE	5,3	43,24	0,8295
Oman	4,3	31,83	0,6846
Saudi Arabia	4,8	36,17	0,7119

Source: Shkvarya Semenov, 2022.

In particular, small and medium-sized enterprises in GCC countries are becoming more involved in the digitalization of their national economies, producing new products and creating new high-paying jobs, including agriculture.

Thus, countries in the region continue to build on their achievements in the digital economy (albeit almost through the transfer of advanced and high technologies only) and face ever-evolving and renewed risks of ongoing technological innovation.

For the transition to the digital age in a given region, the government must be responsible for creating an enabling environment through policies and regulations that foster digital transformation. High-level political support, ensuring a stable and predictable policy environment, promoting a sustainable environment for private sector investment, adopting regulatory best practices and stimulating demand for digital solutions are components of an enabling environment. An enabling environment for all major components and critical sectors of digital transformation is fundamental.

Regulators need to keep pace with advances in technology, consider new regulatory frontiers and create a framework on which digital transformation can realize its full potential.

Public policy, regulatory and legal frameworks should be relevant, flexible, incentive-based and market-oriented to support digital transformation in all sectors and regions of the continent.

In addition, recognizing that the Internet is an important tool and dynamic force for economic, social and cultural development, there is a need to focus the discussion on Internet governance and related public policy issues to enable, develop and support the local digital economy.

A telling example is the Inclusive Internet Index, which rates countries on four indicators:

1. availability (assesses the quality and breadth of available infrastructure for Internet access, as well as levels of Internet use);
2. affordability (the cost of access in relation to the income level of the population and to the level of competition of Internet providers);

3. relevance (availability of content in the local language and its diversity);
4. readiness (mass access opportunities, including public skills, cultural and information policies).

As a result of the implementation of national digitalization strategies in 2022, some Middle Eastern countries improved their indicators in infrastructure development, support for internet access, digital readiness, etc. For example, the UAE improved its position in the global ranking and became the leader among Middle Eastern countries, ahead of Qatar, the leader of previous years. In terms of internet accessibility, the UAE ranked 5th in the world in 2022 due to its high level of connectivity quality and usage volumes. However, the UAE performed below the global average in other areas of the ranking (Table 6).

Table 6. Middle East countries ranking in the Inclusive Internet Index for 2019-2022

Country	Place in the world			
	2019	2020	2021	2022
UAE	40	35	31	26
Qatar	34	30	29	27
Kuwait	43	34	36	33
Oman	39	39	37	38
Saudi Arabia	35	38	43	39
Bahrain	-	47	45	40
Morocco	57	61	57	52
Jordan	51	57	56	60
Lebanon	-	62	71	74

Source: created by the authors according to The Inclusive Internet Index, 2023.

Qatar has moved to 2nd place among Middle Eastern countries in the overall Inclusive Internet Index and is among the top performers in terms of accessibility and readiness. In the area of information policy, Wi-Fi accessibility initiatives are being actively promoted. But if you look at the global accessibility ranking - Qatar is only ranked 47th.

Kuwait ranks 33rd in the world and is one of the leaders in Internet accessibility in the region. However, relevance and readiness remain weaknesses due to a lack of relevant content on the Internet, relatively low literacy rates and challenges in information policy development.

In terms of overall internet inclusiveness, Oman ranked 38th in 2022. In the «Readiness» category, Oman leads the Middle East and ranks 10th globally. The country's strong rates are driven by continued improvements in trust in government websites and applications, as well as in e-commerce security. Despite these advances, trust in social media information declined in 2022. Internet accessibility indicators in Oman are low because of the weak competitive environment.

Saudi Arabia experiences periodic fluctuations in the Inclusive Internet Index ranking and was the 39th in 2022 – an improvement in 2021 and a trend towards regaining lost ground in previous years. It ranked 2nd among the Middle East countries in terms of relevance, thanks to the active development of eHealth. Ranked 4th in the region for accessibility, Saudi Arabia's growth in this category was driven by improvements in internet quality and unlicensed software policies.

Bahrain is ranked 40th in the world in 2022, showing an improvement of 5 positions from last year. Its local and relevant content, digital literacy, trust and security scores are significantly higher than the global average. However, the competitive digital environment in the country is weakening year on year.

Despite above-average accessibility indicators, Morocco's overall performance in supporting Internet access globally, as well as among Middle Eastern countries, remains weak. This is partly the result of low digital literacy and limited development of e-connectivity and broadband strategies.

Jordan ranks among the last countries in the Middle East and 60th in the world on the Inclusive Internet Index. Disadvantages include low internet connection speed and low levels of internet trust and security. In the «Readiness» category, Jordan ranks penultimate in the region, due to a marked decline in trust in government and non-government organizations' websites and apps from year to year. In 2020-2021 Jordan achieved an increase in relevance (local language content availability and diversity) due to the benefits of local and e-health content, but the country saw a drop in relevance in 2022.

Lebanon's overall performance is constrained by low readiness indicators, where the country ranks 97th out of 100 countries in the Index. Lebanon's weakness is in its policy environment along with low literacy rates, with Lebanon ranking 99th out of 100 countries in the «policy» sub-category and 92nd out of 100 countries in the «literacy» sub-category.

However, it should be noted that almost all countries under review (with the exception of Jordan and Lebanon) have a steady upward trend in their Inclusive Internet Index scores.

A number of Arab countries have successfully positioned themselves in the global information and communication technologies (ICT) market, particularly in the area of services and outsourcing. For example, this sector is growing at an annual rate of 7.5%, partly due to business ties with business entities in Saudi Arabia and other Gulf countries (MENA Infrastructure Key Themes, 2017). ENOC and EPPCO companies in Dubai, among others, have upgraded their "RFID-enabled prepaid fueling" system to allow free and cardless automated payments. Some major oil companies in the GCC countries are seeking to make the development of their oil fields smarter by digitizing a number of operations using big data, as well as analyzers, sensors and control systems.

Another positive example is the taxi company Careem, which is able to compete with other players in the Middle East market by using a strategy based on B2B integration and complementary tools such as scheduled bookings not only for its drivers, but also for, for example, for the drivers of the Road and Transports Authority in Dubai.

In the UAE, Etisalat and Du companies have launched several digital projects, including «smart cities».

As for other countries in the region, Qatar and Bahrain are leading Arab countries in the ICT supply and in innovation sphere due to their high 3G coverage and low prices. Qatar's highly developed Internet in ICT supply and innovation (MENA Infrastructure Key Themes, 2017).

Despite the widespread adoption of smartphones in the UAE, Bahrain and Qatar (as discussed earlier), due to weaker smartphone use in most other Arab states in the Middle East and North Africa, the regional average is quite low.

Saudi Arabia, in its «Vision 2030» program, declares a very ambitious goal: to become one of the top countries in the world as established on the basis of the E-Government Survey Index.

In order to achieve the objectives, set out in «Vision 2030», the Digital Transformation Program was launched in the Kingdom, under which the Fekra Tech platform was created to address primarily the challenges in the Saudi healthcare sector (Al-Dosari, 2016).

Another program, the largest e-platform Etimad, works with 450 government agencies that use its portal.

There is also the Absher program, which links to more than 130 public services used by citizens of the Kingdom. For example, thanks to this program, the procedure for renewing a passport has been reduced from eight to one day.

Bahrain's digital strategy is focused on eight key points: increasing participation of society; development of partnership between the state and private sector in information and communication services promoting; improving digital literacy of the population and government employees; achievement of higher level of performance; ability to co-operation; government efficiency; offering quality services and strengthening e-government communication channels; promoting innovation and entrepreneurship.

Nowadays the region as a whole is mainly an importer and consumer of high technologies. Governments in the Middle East are spending quite a lot of financial resources on information technology and its maintenance (McKinsey Global Survey, 2021).

Currently, the digital market in the countries of the region under review is highly fragmented. Almost no regional company is able to achieve the required level of economic efficiency, as each of them maintains its own service provider. Information experts believe that in order to overcome the fragmentation of this market, Arab governments need to promote the consolidation of local providers and support joint ventures.

The digital transformation evolving in the Middle East region is placing demand for highly skilled ICT professionals. According to "Oxford Economic Survey", among all technical professions, digital specialists seem to be the most in demand. Considering the shortage of local and regional human resources in this field, many projects in Arab countries are implemented by global companies.

It seems that some solutions may include the use of new technologies (information and communication, digital technologies, etc.). At the same time, many experts believe that digital transformation in this group of states must be accompanied by social innovations and some cultural shifts in order to achieve a positive result. At the same time, they emphasize that achieving a balance between traditional and modern cultural standards is extremely important.

A number of recommendations are offered for the development of the digital economy in the Middle East:

1. To continue to develop and implement national, regional and continental digital infrastructure master plans, considering the convergence of technologies;
2. To modernize existing infrastructure and integrate and complement new infrastructure projects;
3. To increase investment in telecommunications infrastructure at national and regional levels ads to develop financial instruments through partnerships between investors, government, financial institutions and international partners;
4. To create innovative financial tools for infrastructure deployment with a focus on underserved areas;
5. To promote a favourable regulatory environment for competitive and harmonized regional and continental markets of communications;
6. Develop or enhance existing digital platforms to serve citizens, businesses and public institutions in all aspects of life, including health, education, commerce, transport and public goods;
7. Implement or strengthen ICT reforms;
8. Digitize the basic information infrastructure for postal services, especially for the development of e-commerce;
9. Encourage public-private partnerships to increase investment.

The authors' analysis of the adopted digitalization strategies in the Middle East suggests that the leading role in this process at the current stage belongs to the state. Firstly, digital technologies and, as before, innovations, are introduced at large state-owned enterprises and with the help of state incentives. At the same time, we can talk about the significant prospects offered by digitalization for small and medium-sized enterprises. Second, the predominant role of the state in the processes of digitalization of the Middle East economy is also evident in the legislative aspect, as states are, to varying degrees, seeking to create enforcement frameworks for greater adoption and application of digital capabilities in various spheres, including "digital state", "smart city", etc. Thirdly, we can say that the demand for digital technologies in the Middle East remains fragmented. It covers to a greater extent the energy, chemical and petrochemical industries, as well as the financial sector, including capital management. There is a growing demand for digitalization in the social sphere, such as education and medicine (16 Key Internet statistics, 2023). It is worth noting that such aspects as e-commerce are less developed in Middle Eastern countries than in other developing regions. Finally, depending on the digitalization objectives formulated in the relevant strategies and government programs and on the level of development of the national economies of the Middle East countries, it can be concluded that there is significant differentiation in this aspect between the countries.

4. Conclusion

This study allows us to formulate several conclusions regarding the process, prospects and challenges of the development of economic digitalization in the Middle East. First of all, it is the accelerated evolution of digitalization in the Middle East countries. While the implementation of innovations and technologies in these countries has been a bit slower than in others, digitalization is actually developing in the same direction as at the global level. Further, it is worth noting the persistent regional differentiation and fragmentation in digitalization, which weakens regional capabilities. Finally, we see the prospects of digitalization as an important basis for the development of the labour market and the whole social sphere in the Middle East.

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