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The Digital Economy and the Challenge of Sustainable Development in the Arab World (The Experience of the United Arab Emirates)

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Abstract

The digital economy is considered one of the most important economic resources in the current era. It has contributed to changing traditional economic concepts concerning the definition of economic resources and how they can be used to address existing economic and social challenges. The digital economy relies on human knowledge as the cornerstone of the information and technological revolution and as a means of achieving sustainable development. This research highlights the role of the digital economy in achieving the Sustainable Development Goals in Arab countries, focusing on the United Arab Emirates as a pioneering experience in the Arab world.

Keywords: Digital Economy, Information and Technological Revolution, Sustainable Development, Arab World, United Arab Emirates.

Introduction

Digital transformation has become an urgent necessity in the present era, given the rapid digital developments taking place worldwide. The transition from a traditional economy to a digital economy is experiencing accelerated growth across the economies of many countries, including Arab countries. The digital economy refers to an economic activity that connects individuals, institutions, government agencies, data, and processes through the Internet. High-speed connectivity constitutes the backbone of the digital economy, as it facilitates communication between individuals, institutions, and machines through the Internet and mobile phones.

Several Arab countries have adopted digital economy strategies to achieve and ensure the continuity of sustainable economic development. The United Arab Emirates is one such example, representing a pioneering experience in both the Arab world and internationally.

Based on the foregoing, this research addresses the following problem: **What are the challenges facing the digital economy in achieving sustainable development in the Arab world? And what is the current situation in the United Arab Emirates?**

1. General Background

The digital economy is a relatively modern economic concept that has acquired considerable importance across various global economies, owing to its role in the development and advancement of numerous countries that have adopted it as a mechanism for mitigating the severity of risks and economic crises, including epidemiological crises such as the COVID-19 pandemic. It is also considered one of the essential pillars for achieving the different dimensions of sustainable development.

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1.1. The Digital Economy

With the beginning of the global spread of the Internet and the rapid technological developments that followed, the digital economy has come to incorporate modern technologies, including fixed broadband access at speeds reaching tens of megabytes per second, mobile broadband, smartphone applications, and social platforms. In recent years, all these developments have been associated with the need to consider the lessons learned from the COVID-19 pandemic and incorporate them into policymaking, strengthen resilience in preparation for future shocks, and achieve fair and inclusive economic growth over the long term.

Several definitions of the digital economy have been proposed, including the following:

- "An advanced economic model based on the widespread use of information technology and the Internet in various aspects of economic activity, particularly electronic commerce, relying heavily on creativity, knowledge, and technological development, especially in the fields of information and communication technologies."

- "The continuous interaction, integration, and coordination between information and communication technologies, on the one hand, and the national, industrial, and international economy, on the other, in a manner that ensures transparency, immediacy, and accessibility to all economic, commercial, and financial indicators within a country during a given period. More specifically, information technology and its various tools, such as the World Wide Web, transform and change traditional patterns of economic performance in finance, business, trade, and investment into immediate and real-time forms, thereby improving competitive positioning through the time factor, namely, competition based on time."

Based on the foregoing, the digital economy can be defined as an economy founded on creating integration between information and communication technologies and the global economy, with the aim of ensuring the smooth flow of information, goods, and services.

The digital economy is based on a set of fundamental components, namely:

- Technical infrastructure and equipment;
- The existence of a legal environment regulating the digitalisation sector;
- The financial sector's ability to provide and develop investments and venture capital to support and promote innovative ideas;
- Human capital, represented by human resources concerned with education and training;
- Research and development.

The of the digital economy can generate numerous benefits, including:

- The actual cost lies in research and innovation rather than in devices and equipment. The expertise derived from scientific research takes the form of accumulated knowledge that drives industrial development and promotes the creation of additional technological programmes and modern applications characterised by strength and effectiveness;
- Increasing opportunities for cooperation between institutions at an accelerated pace;
- Contributing to the dissemination of knowledge, or what is known as the knowledge economy;
- Improving competitive positions, as information technology and its various tools transform and change traditional patterns of economic performance in finance, business, trade, and investment into immediate and real-time forms;
- Increasing the integration of national economies into the global economy and facilitating decision-making through easier access to information.

Despite the advantages offered by the digital economy, it faces several challenges, particularly in developing countries, which hinder their progress towards adopting this economic model. The most significant challenges include:

- The absence of the infrastructure required to support the establishment of a digital economy in many countries;
- A lack of trust in electronic transactions, such as electronic payment methods and the electronic authentication of documents;
- Weak human resources and the absence of the technological expertise required for this type of technological transaction;
- Violations of intellectual property laws, which constitute one of the most important foundations of the information industry.

The digital economy is based on five strategic pillars designed to meet citizens' needs and ensure continuous interaction with them, thereby contributing to the achievement of sustainable development goals. These indicators are as follows:

1. **Digital Government:** This involves activating information and communication technologies to provide secure and more effective electronic services that meet the needs of individuals and society. It also entails intensifying digitalisation efforts to improve efficiency and transparency within the government sector.

2. **Digital Foundations:** This involves providing the foundations necessary for a robust digital system, including infrastructure, policies and regulations, digital skills, financing, and governance.

3. **Citizens' Digital Readiness:** This dimension aims to place citizens at the centre of the digital transformation system and ensure that digital technologies contribute to improving the quality of life of citizens and civil society.

4. **Digital Innovation:** This refers to the application of digital technologies to solve business problems by improving processes, enhancing customer experiences, and introducing new business models, thereby creating new sources of added value.

5. **Digital Business:** This dimension aims to make the business sector the primary beneficiary of digital transformation processes. This will increase the value delivered to consumers, improve cost efficiency, and establish a broader customer base by providing opportunities to enter new markets.

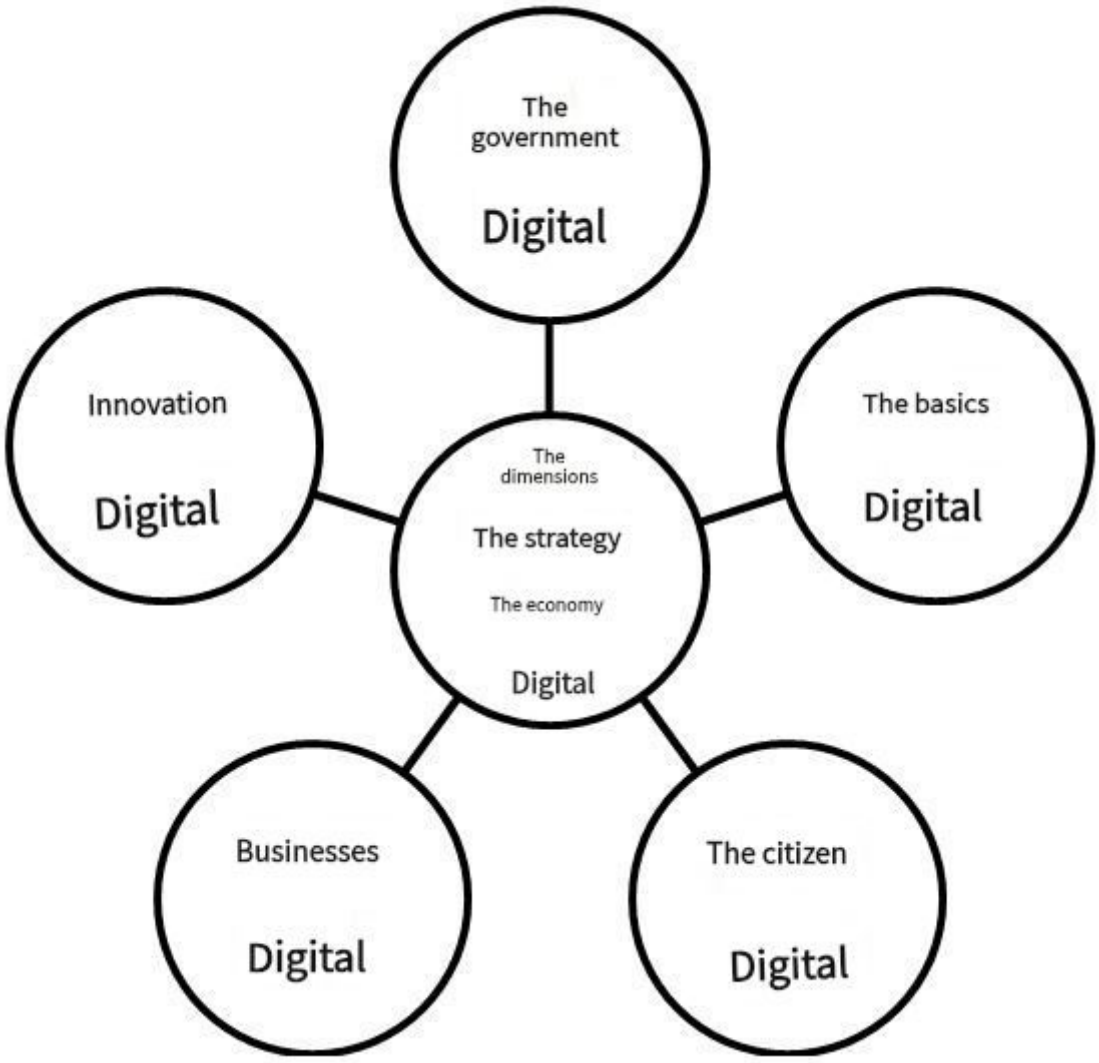

Figure 01: Strategic Dimensions of the Digital Economy in the Arab World

Source: Prepared by the researchers based on previous literature.

1.2. Sustainable Development

As a result of the serious economic and environmental problems facing the world today, the need has emerged for a mechanism capable of reducing the consequences of these problems. This has led to the emergence of the concept of sustainable development, which has gained considerable momentum at the global level. It is regarded as a mechanism that makes it possible to maintain development and improve individuals' quality of life.

Several definitions of sustainable development have been proposed, including the following:

- "Development that meets the needs of present generations without compromising the ability of future generations to meet their own needs" (definition of the World Commission on Environment and Development, 1987).

- "Development that reconciles environmental, economic, and social development, thereby establishing a virtuous relationship between these three pillars. It is economically efficient, socially equitable, and environmentally viable. It is development that respects natural resources and ecological systems, supports life on Earth, and ensures economic considerations without neglecting the social objective, which is reflected in combating poverty, unemployment, and inequality and pursuing justice" (definition adopted at the Earth Summit held in Rio de Janeiro, Brazil, in 1992).

Based on the foregoing, sustainable development can be defined as a programme designed to ensure the continuity of economic, social, and environmental dimensions in a manner that meets individuals' present needs while remaining committed to protecting ecosystems and ensuring their continuity.

In 2015, all United Nations Member States adopted the Sustainable Development Goals (SDGs), also known as the Global Goals*, as part of the 2030 Agenda for Sustainable Development. This was intended to mobilise efforts to eradicate poverty, protect the planet, and address climate change. These goals are as follows:

1. No Poverty

Poverty is more than simply a lack of income, resources, or guaranteed sustainable livelihoods. Its manifestations include hunger, malnutrition, limited access to education and basic services, social discrimination, exclusion from society, and the absence of opportunities to participate in decision-making. Approximately 10% of the world's population experiences extreme poverty, particularly in the context of the COVID-19 pandemic.

2. Zero Hunger

Eradicating hunger, achieving food security and improved nutrition, and promoting sustainable agriculture constitute the second of the 17 Sustainable Development Goals adopted by countries in 2015 to address global challenges. This goal is pursued by ensuring adequate nutrition, achieving food security, and implementing sustainable agricultural practices.

3. Good Health and Well-being

This goal involves working towards a continued reduction in mortality rates, including infant and under-five child mortality, and limiting the spread of epidemics such as AIDS, tuberculosis, and malaria. The 2030 Agenda for Sustainable Development also addresses emerging health challenges by including measures to combat non-communicable diseases, which account for 70% of deaths worldwide. This requires countries to commit to strengthening healthcare systems through healthcare financing, universal health coverage, sexual and reproductive health services, training qualified healthcare professionals, risk management, access to quality medicines and vaccines, and combating various forms of pollution.

4. Quality Education

Access to quality education constitutes the foundation for improving people's lives and achieving sustainable development. Countries have therefore focused on increasing access to quality education at all educational levels.

5. Gender Equality

This goal involves ensuring equal opportunities and equality in education, healthcare, decent work, representation in political and economic processes, and decision-making.

6. Clean Water and Sanitation

Water scarcity affects more than 40% of the world's population, and this situation is expected to worsen as global temperatures rise due to climate change. Achieving this goal requires increased investment in infrastructure, the provision of sanitation facilities, and the promotion of hygiene at all levels. It also requires ensuring the protection and restoration of water-related ecosystems, including forests, mountains, wetlands, and rivers, while promoting international cooperation to encourage efficient water use and support treatment technologies in developing countries.

7. Affordable and Clean Energy

Achieving this goal requires increased investment in clean energy sources, such as solar, wind, and geothermal energy. Furthermore, adopting cost-effective standards for a wide range of technologies would reduce global electricity consumption in buildings and industry by 14%, equivalent to the output of approximately 1,300 medium-sized power plants. Expanding infrastructure and upgrading technology to provide clean energy in all developing countries also represents a crucial objective that can stimulate growth and benefit the environment.

8. Decent Work and Economic Growth

The global economy has experienced significant expansion over the past millennium. However, this has not prevented global crises, such as the global economic crisis of 2008 and the COVID-19 pandemic in 2020, which resulted in hundreds of thousands of workers losing their jobs, thereby increasing global poverty rates. Sustainable development aims to achieve sustained economic growth and increase productivity and technological innovation through encouraging entrepreneurship, creating employment opportunities, and adopting effective measures to eliminate forced labour, slavery, and human trafficking. These measures are essential to achieving full and productive employment and decent work.

9. Industry, Innovation and Infrastructure

Investment in industry, infrastructure, and innovation is considered one of the most important pillars for achieving economic growth and sustainable development.

10. Reduced Inequalities

Income inequality is a global problem that requires urgent measures to address it. Such measures include improving regulatory and supervisory frameworks governing markets and financial institutions, encouraging development assistance, and promoting foreign direct investment in the regions most in need.

11. Sustainable Cities and Communities

Making cities safe and sustainable requires ensuring that residents have access to safe and affordable housing and improving the living conditions of slums and informal settlements. It also involves investing in public transportation, creating green public spaces, and improving urban planning and management systems to ensure that they are inclusive and participatory.

12. Responsible Consumption and Production

Sustainable consumption and production patterns involve promoting resource and energy efficiency, ensuring sustainable infrastructure, providing access to basic services, creating decent and environmentally friendly employment opportunities, and improving the quality of life for everyone. Implementing sustainable consumption and production patterns helps achieve comprehensive development plans, reduce future economic, environmental, and social costs, strengthen economic competitiveness, and alleviate poverty.

13. Climate Action

International efforts must be intensified to adapt to climate change by integrating disaster risk reduction measures into national strategies. This also requires political will and the use of technological measures. It is still possible to limit the increase in the global average temperature to two degrees Celsius above pre-industrial levels; however, this requires urgent collective action by all countries worldwide.

14. Life Below Water

This goal seeks to sustainably manage and protect marine and coastal ecosystems from pollution and address the impacts of increasing ocean acidification. Strengthening the conservation and sustainable use of ocean-based resources through international law can help alleviate some of the challenges facing our oceans.

15. Life on Land

This goal involves conserving, restoring, and sustainably using terrestrial ecosystems, including forests, wetlands, drylands, and mountains. Halting deforestation is also essential to mitigating the effects of climate change. Urgent measures must be taken to reduce the loss of natural habitats and biodiversity, which constitute part of the common heritage of all humanity.

16. Peace, Justice and Strong Institutions

The Sustainable Development Goals seek to significantly reduce all forms of violence by working with governments and local communities to identify lasting solutions to conflict and insecurity. Strengthening the rule of law and promoting human rights are fundamental elements of this process. It also includes efforts to reduce illicit arms flows and enhance the participation of developing countries in global governance institutions.

17. Partnerships for the Goals

This goal involves strengthening cooperation between countries of the North and South, as well as among countries of the South themselves, by supporting national plans aimed at achieving all the goals. Promoting international trade and helping developing countries increase their exports are also integral to establishing a rules-based, fair, equitable, and open global trading system that benefits everyone.

Sustainable development is a three-dimensional form of development whose dimensions are interconnected and overlapping within an interaction framework characterised by the rational management and efficient use of resources. These dimensions are illustrated in the following figure:

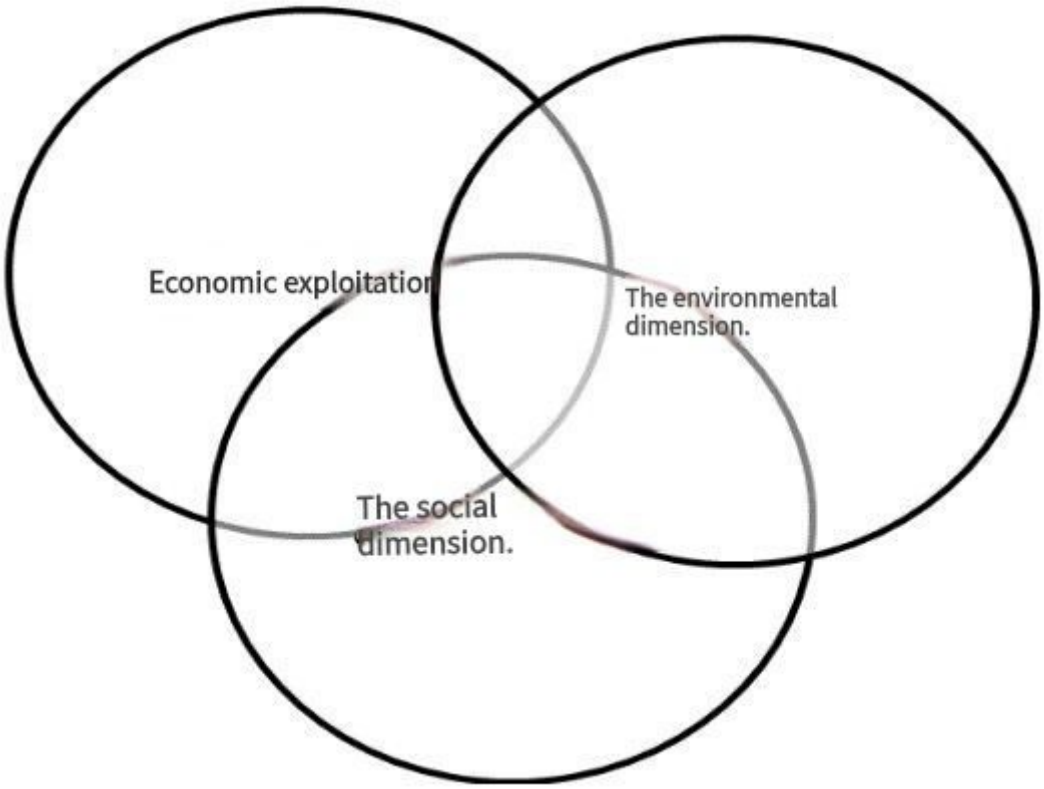

Figure 02: Dimensions of Sustainable Development

Source: Rida Dib and Slimane Mahna (2009), "Planning for Sustainable Development," *Damascus University Journal of Engineering Sciences*, Vol. 25, No. 01, pp. 487–520. https://www.damascusuniversity.edu.sy/mag/eng/images/stories/deeb.pdf

Based on the figure, the following can be identified:

1. **The Environmental Dimension:** This concerns the protection and management of natural resources in a

manner that ensures their continuity and prevents their depletion.

2. **The Social Dimension:** This involves guaranteeing individuals' right to live in a healthy environment and meeting their needs in a manner that ensures a better standard of living without compromising the resources and capabilities of future generations.

3. **The Economic Dimension:** This involves developing mechanisms that allow resources to be managed and distributed more effectively and efficiently.

2. The Digital Economy and Sustainable Development

The digital divide constitutes one of the most significant challenges facing the Arab world in its efforts to strengthen the contribution of the digital economy to achieving the Sustainable Development Goals. This requires adopting a package of measures, procedures, policies, and national strategies, alongside regional cooperation, with the aim of contributing to access to technology through the use of information and digital communication technologies.

2.1. The Impact of the Digital Economy on Sustainable Development

If the Internet were a country, it would be the sixth-largest energy consumer and the seventh-largest source of carbon dioxide emissions on this planet! Faced with the climate emergency, biodiversity collapse, and resource depletion, we must rethink our existing models. At the same time, digital technology is more than merely a technical tool: it enables us to develop new ways of working, accessing information, and carrying out activities, while making new forms of mobilisation, cooperation, and participation possible.

The digital economy can have a significant impact on achieving the Sustainable Development Goals through the advantages it offers in facilitating and activating these goals. Its impact on the Sustainable Development Goals can be summarised as follows:

1. No Poverty

The digital economy facilitates access to financial services and provides accurate and timely information, thereby ensuring equal rights of access to economic resources and market insights, which contributes to poverty eradication.

2. Zero Hunger

Information and communication technologies help farmers improve crop quality and increase the productivity of their projects by improving access to market information, weather forecasts, training programmes, and other electronic applications specifically designed to meet their needs.

3. Good Health and Well-being

Digital technologies enable patients to communicate with healthcare services remotely, regardless of their proximity to healthcare centres. For example, healthcare workers can identify epidemics, prepare for them, recognise their symptoms, follow established treatment protocols, conduct remote diagnoses, and obtain expert support.

4. Quality Education

Mobile devices enable students to access educational services anytime and anywhere. Mobile learning also makes it possible to overcome economic barriers and disparities between urban and rural areas, in addition to addressing the educational gap between genders.

5. Gender Equality

The digital economy enables all members of society to access the same resources and opportunities equally through the Internet. It also allows women to own businesses and manage commercial projects, while facilitating access to employment opportunities.

6. Clean Water and Sanitation

The importance of information and communication technologies is particularly evident in smart water management and facilitating the measurement and monitoring of water supplies, as well as implementing necessary interventions. These technologies empower practitioners at the local level to ensure the provision of water, sanitation, and public health services for everyone. Furthermore, as the costs of information and communication technologies continue to decline, operational processes can be strengthened and service quality improved.

7. Affordable and Clean Energy

Information and communication technologies can be transformed and developed to become environmentally friendly and reduce carbon emissions. On the other hand, solutions based on information and

communication technologies, including smart grids, smart buildings, and smart logistics, help move the world towards a more sustainable and energy-efficient future. These green technologies and processes have the potential to play an important role in reducing greenhouse gas emissions.

8. Decent Work and Economic Growth

Information and communication technologies constitute a priority within youth employment and entrepreneurship strategies in all countries. This is not merely because most jobs require information and communication technology skills, but also because technology has the capacity to transform working methods and practices everywhere and create new employment opportunities.

9. Industry, Innovation and Infrastructure

Without digital infrastructure, the world will be unable to provide the information and communication technology applications that contribute to achieving solutions for the Sustainable Development Goals. The role played by the International Telecommunication Union in allocating frequency spectrum and adopting appropriate standards to facilitate the development of digital infrastructure, such as fifth-generation systems (5G), will lead to scalable and adaptable solutions that support all the Sustainable Development Goals.

10. Reduced Inequalities

The digital economy helps reduce various forms of inequality within and between countries by enabling less privileged groups in society to access information.

11. Sustainable Cities and Communities

The digital economy provides innovative approaches to managing cities with high levels of efficiency through smart applications, including smart buildings, water management systems, and intelligent transportation systems, while rationalising energy consumption and improving waste management.

12. Responsible Consumption and Production

Information and communication technologies are associated with sustainable consumption and production patterns in terms of increasing the removal and disposal of non-recyclable electronic waste. In addition, innovative information and communication technology applications contribute to sustainable production and consumption. Cloud computing, networks, smart metering, and lower energy consumption by information and communication technologies can have a positive impact on reducing overall consumption.

13. Climate Action

The digital economy enables Earth observation and the sharing of information related to weather, atmospheric conditions, forecasting systems, and early warning systems. This makes it possible to monitor climate changes and strengthen adaptive capacity by helping mitigate the effects of climate change.

14. Life Below Water

This can be achieved by preserving the ecosystems of rivers, seas, and oceans and ensuring their sustainable use through improved monitoring.

15. Life on Land

The digital economy can play an important role in conserving terrestrial ecosystems and ensuring their sustainable use while preventing biodiversity loss, particularly through monitoring and reporting mechanisms that strengthen oversight and accountability.

16. Peace, Justice and Strong Institutions

Information and communication technologies facilitate crisis management, humanitarian assistance, and peacebuilding efforts. The growing use of open data by governments increases transparency and helps stimulate economic growth. Information and communication technologies are also essential for record-keeping and tracking government data and local demographic information.

17. Partnerships for the Goals

Information and communication technologies are crucial to achieving all the Sustainable Development Goals because they act as catalysts and accelerators for the three pillars of sustainable development: economic growth, social inclusion, and environmental sustainability. They also provide creative and effective means of implementation.

2.2. The Digital Economy in the United Arab Emirates

The United Arab Emirates is considered one of the governments with the highest levels of investment in

adopting and implementing advanced digital technologies in both the public and private sectors. In 2013, the UAE announced a strategic framework for transitioning towards digital government, which included several strategic initiatives at the federal level to support the transformation of all government services and make them available electronically through various channels.

The strategic plans of the UAE economy are primarily based on adopting the digital economy, as the latter contributes to creating genuine opportunities for foreign direct investment. Accordingly, the country is implementing plans to strengthen its digital economy through adopting the UAE Strategy for the Fourth Industrial Revolution*. One of its objectives is to enhance digital security through the adoption of digital economy policies and digital transaction technologies (Blockchain) in services and financial transactions.

The UAE Government was the first worldwide to launch the Dubai Blockchain Strategy in October 2016. This initiative resulted from cooperation between the Dubai Digital Authority and the Dubai Future Foundation, with the aim of exploring and evaluating the latest technological innovations that contribute to providing safer, more efficient, and more effective services.

Digital transformation is a top priority for the UAE. The World Economic Forum ranked the UAE among the world's top 20 countries in terms of performance in adopting future technologies and innovation. Meanwhile, the country ranks second among the governments that make the greatest use of advanced technologies worldwide, according to the World Economic Forum's Network Readiness Index.

In April 2018, the UAE Government launched the UAE Blockchain Strategy 2021. The strategy aims to harness and employ advanced technologies to transfer 50% of federal government transactions onto a Blockchain platform by 2021. This technology is expected to save time, effort, and resources and enable individuals to conduct most of their transactions at a place and time compatible with their lifestyles and working arrangements.

This strategy also contributes to achieving the following savings:

- AED 11 billion spent annually on processing and documenting transactions and documents;
- 389 million government documents;
- 77 million working hours and 1.6 billion kilometres of driving for motorists.

The UAE Government aims to employ future technologies in the service of humanity by recording and documenting digital transactions using Blockchain technology and assigning a distinctive digital fingerprint to data that cannot be penetrated or altered. This approach contributes to enhancing the level of digital security of national data and reducing operational costs by limiting paper-based transactions, thereby accelerating the decision-making process.

To ensure proper implementation and transparency within a structured institutional framework, the UAE established the Global Blockchain Council to explore and examine its current and future applications and work towards regulating digital transactions through Blockchain technology platforms.

The Council seeks to facilitate transactions across various financial and non-financial sectors and increase their efficiency and reliability. It consists of 46 members representing the main potential stakeholders in the digital transactions sector, including government entities, leading banks, free zones, and technology institutions operating in the field of digital transactions.

The digital economy's contribution to the UAE's total economy reached 9.7%, equivalent to USD 38 billion, in 2022. This contribution is expected to reach 20% of the total economy, representing an estimated value of USD 140 billion, by 2030.

The following table presents the most important digital platforms and applications in the United Arab Emirates:

Table 02: Major Digital Platforms and Applications in the United Arab Emirates

Major Digital Platforms and Applications
Individual Transfer Platform
E-Commerce Portal
Foreign Direct Investment Dashboard
Trade Map

Table 02: Major Digital Platforms and Applications in the United Arab Emirates *(continued)*

Major Digital Platforms and Applications
Trade Relations Dashboard

Source: Farida Kafi and Nassira Bilal (2022), "The Role of the Digital Economy in Achieving Economic Development in the Middle East in the Context of Economic Diversification: The Experience of the United Arab Emirates," *Algerian Journal of Political Economy*, Laboratory of "Political Economy between Economic Development and the Political Challenges Facing Arab and African Countries," University of El Oued, Vol. 04, No. 02, pp. 135–150.

The Fourth Industrial Revolution can be defined as a technological revolution that integrates physical, digital, and biological technologies to produce unprecedented services and products across numerous sectors. Its main fields include the following:

- **Physical Technologies:** These are easily identifiable due to their tangible nature, such as self-driving cars and advanced robotics.

- **Digital Technologies:** These are technologies based on data that connect it to the physical world through connectivity, particularly the Internet of Things (IoT).

- **Biological Technologies:** These are technologies based on genetics, genomics, and genetic modification, such as treating incurable diseases through the use of advanced medicines developed according to individuals' genetic characteristics.

The Fourth Industrial Revolution is characterised by several features, including:

- **Digitalisation:** This refers to the use of digital transformation applications across all fields and the transition towards innovative services and operations based on emerging technologies.

- **Interaction Between Emerging Technologies:** The central vision of the Fourth Industrial Revolution involves connecting technologies with one another across all fields.

- **Creative Change:** New technologies and the interaction between them lead to the emergence of new methods of innovation and consumption, in addition to transforming the ways public services are delivered and accessed and creating new methods of communication and governance.

- **Speed:** This refers to the rapid development and dissemination of innovations.

- **Breadth and Depth:** Reliance on the digital revolution brings together multiple technologies, leading to major transformations in the economy, business activities, and the way we work.

- **Impact and Generalisation:** The Fourth Industrial Revolution will involve transformations across various fields, countries, institutions, and societies.

The general framework of the UAE Strategy for the Fourth Industrial Revolution consists of six main pillars, as follows:

1. Key Sectors under the "Future of Humanity" Pillar

These include:

- **Enhanced Education:** Developing an enhanced and intelligent educational experience to improve educational outcomes in line with the requirements of the Fourth Industrial Revolution, with a focus on advanced technologies and sciences, including bioengineering, nanotechnology, and artificial intelligence.

- **Genomic Medicine:** Positioning the UAE as a global centre for intelligent personalised genomic medicine* and genomic medical tourism, improving healthcare standards, and developing medical solutions and personalised genomic treatments according to patients' needs.

- **Robotic Healthcare:** Making use of robotics and nanotechnology to enhance the capacity to provide remote healthcare and surgical services within the country and abroad.

- **Connected Health:** Developing and adopting connected healthcare** in the country to provide intelligent medical solutions around the clock through wearable technologies and technologies implanted in the human body.

2. Key Sectors under the "Future Security" Pillar

These include:

- **Water and Food Security:** Developing an integrated and sustainable water and food security system through the application of bioengineering sciences, advanced technologies, and renewable energy technologies.

- **Economic Security:** Building the digital economy and adopting digital transaction technologies (Blockchain) to strengthen the country's economy in the fields of finance and services.

- **Space Data:** Employing satellite space data in strategic decision-making within the country through specialised data platforms.

- **Defence Industries:** Developing advanced defence capabilities and industries through the use of robotics and technology to strengthen the country's defence capabilities.

3. Key Sectors under the "Future Experience" Pillar

These include:

- **Smart and Interactive Government Services:** Providing the best smart, interactive, and virtual government services based on artificial intelligence and robotics around the clock, in a manner that ensures service quality and customer satisfaction.

- **Smart Hospitality and Trade:** Providing an intelligent, interactive, and personalised customer experience through the use of advanced technologies and sciences in hospitality and trade, making the country a leading tourist destination for the Fourth Industrial Revolution.

- **Smart and Interactive Cities:** Transforming the country into a global centre for smart infrastructure and interactive buildings connected to artificial intelligence in order to achieve sustainability and improve people's lifestyles.

- **Transport and Mobility:** Transforming the country into an open global laboratory for innovation in autonomous mobility and the operation of ground and flying vehicles.

4. Key Sectors under the "Future Productivity" Pillar

These include:

- **Additive Manufacturing:** Focusing on three-dimensional additive manufacturing in terms of design, programming, and production to unlock the competitive potential of entrepreneurs and the national economy globally.

- **Construction and Building Using 3D Printing Technology:** Transforming the country into a global centre of excellence in engineering design and construction using three-dimensional printing technology and robotics to generate added value for the national economy.

- **Smart Grids:** Developing decentralised networks for energy generation, consumption, and intelligent asset management in a sustainable manner.

- **Smart Supply Chains:** Developing the next generation of stations and logistics systems connected to artificial intelligence to achieve the highest possible levels of productivity in institutions sustainably.

5. Key Sectors under the "Future Entrepreneurship" Pillar

These include:

- **Space Investment:** Establishing the country as a global platform for ambitious entities involved in space research and investment projects and encouraging national entrepreneurship in this field.

- **Human and Cognitive Augmentation:** Encouraging national research and applications in universities and specialised centres in the fields of brain and neuroscience, human augmentation, and cognitive enhancement, in partnership with specialised international institutions.

6. Key Sectors under the "Foundations of the Future" Pillar

These include:

- **Specialised Talents and Entrepreneurs:** Preparing a new generation of young national talents, capabilities, and entrepreneurs for the Fourth Industrial Revolution and equipping them with the knowledge and skills required in advanced science and technology fields through an educational system focused on practical applications, innovation, and entrepreneurship in priority sectors.

- **An Integrated and Secure Data Environment:** Establishing an integrated and electronically secure big-data environment, connecting it to artificial intelligence, and developing protocols capable of protecting it on a broad scale.

- **Policies and Legislation for the Fourth Industrial Revolution:** Developing policies and legislation to govern emerging sectors and issues related to the Fourth Industrial Revolution, while ensuring the privacy of members of society and achieving human well-being.

- **Values and Ethics of the Fourth Industrial Revolution:** Instilling firmly established values and ethical principles in future generations to ensure the optimal use of the potential offered by the Fourth Industrial Revolution and address its inherent challenges.

- **A Global Centre for the Fourth Industrial Revolution:** Strengthening the country's position as a global centre for the Fourth Industrial Revolution in order to achieve a competitive knowledge- and innovation-based national economy built on applications of Fourth Industrial Revolution technologies.

Conclusion

The digital economy, which is based on information and communication technologies, provides numerous advantages, most notably reduced costs, faster performance, the dissemination of knowledge, and easier access to markets, thereby contributing to the integration of countries into the global economy.

Research Findings

- The digital economy contributes effectively to achieving the Sustainable Development Goals, as demonstrated by the different variables examined in this study.

- The digital economy is an economic model based on the use of information and communication technologies across various economic activities. High-speed Internet connectivity is considered its fundamental pillar.

- Sustainable development is development that meets the needs of present generations without compromising the ability of future generations to meet their own needs. It encompasses economic, social, and environmental fields.

- The Arab digital economy seeks to achieve several strategic dimensions, including digital foundations, digital innovation, digital citizenship, digital business, and digital government.

- The strategic vision of the United Arab Emirates is centred on achieving a globally competitive economy by creating an environment that encourages entrepreneurship and guarantees transparency and innovation.

Recommendations

Based on the research findings, the following recommendations are proposed:

- Developing a culture of digitalisation among individuals and institutions within the country, strengthening human capital, and eliminating digital illiteracy.

- Enacting legislation and laws that guarantee information security and safety, protect intellectual property, and ensure cybersecurity, thereby creating a secure and attractive digital economic environment.

- Giving greater attention to developing Algeria's information and communication technology infrastructure, as this would help accelerate digital transformation efforts, considering that it constitutes a fundamental pillar for achieving sustainable economic development.

- Increasing government and institutional expenditure on research and development in information and communication technologies.

- Focusing on the strengths and fundamental components of the Algerian economy and adopting strategies to address existing challenges in a manner that ensures the continuous development of the components of the digital economy.

- Adopting policies that encourage foreign investment in support of the digital economy.

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