



2528-9705

# Örgütsel Davranış Araştırmaları Dergisi

Journal Of Organizational Behavior Research

Cilt / Vol.: 7, Sayı / Is.: 1, Yıl/Year: 2022, Sayfa/Pages: 228-242

<https://doi.org/10.51847/cxHOxsZOj1>



## THE ROLE OF THE DIGITAL ECONOMY IN ACHIEVING SUSTAINABLE DEVELOPMENT

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### ABSTRACT

Information and communication technology is the main pillar of the digital economy, and it is defined as all the physical components of computers and off-the-shelf software in addition to the communication networks and other equipment required for processing, storage, display, and equipment. Information and communication technology provides a unique platform to host a large number of development services, such as trade, Earth observation services and climate change, and in a way, e-health, remote work, e-learning, e-learning. Hence, investing in these technologies will help to ensure that solutions are found to meet the challenges of sustainable development. This research focuses on the need for a digital economy and harnessing it in order to contribute to achieving sustainable development. In it, the importance of the digital economy was presented, And its importance in working to improve the performance of human resources by empowering individuals by re-thinking training, rehabilitation and continuous development programs, because the digital economy is characterized by weak reliance on the traditional human element, In addition to the difficulty of the ability of social systems to withstand environmental differences in the light of the digital economy, as it focuses on planning and development strategies and works to promote the balanced exploitation of wealth, and some conclusions were drawn about its role in achieving sustainable development, from which many developing countries could benefit.

**Keywords:** Digital economy, Sustainable development, Information and communication technology, Digital literacy, Economic society.

### INTRODUCTION

Since the end of the 20th century and the beginning of the 21st, the world has seen changes in political, economic, social, scientific, technological, cultural, environmental, and informational fields, and other intertwined fields, making the world resemble one community in which information moves quickly and its parts, regions, and states are affected. Fast communication and information technology have shortened distances between individuals.

And testify to this era as the era of technological advances that have flooded various areas of the neighborhood ah squares in general, areas, and the fields of the economy in particular, considering that the economy is an integral part of the national security of people, and an integral part of the development process, as economic institutions are the hope for the future, making the economy one of the important strategies for the development of society.

Geliş tarihi/Received: 19.01.2022 – Kabul tarihi/Accepted: 17.03.2022 – Yayın tarihi/Published: 30.03.2022

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The overall development process focuses on the digital economy, with its rich experiences and clear and specific goals for the development of society and keeping pace with development in all fields, to prepare the individual and provide him with expertise and skills to confront rapid technology and advance his society on a sound scientific basis.

### *The Study Problem*

The digital economy's rise mirrors human civilizations, redefining progress at all levels. The globe has become a little village where people may exchange knowledge and information far and wide. Science and technology over the last century created today's world. Governments that own technology, knowledge, and information on the future (Ibrahim & Al-Haddad, 2018). What is the role of the digital economy in attaining sustainable development? This can be answered by answering the following questions.

1. How does the digital economy help civil society organizations accomplish SDGs?
2. How do civil society organizations use the digital economy to achieve sustainable development needs?
3. How does the digital economy affect sustainable development?

### *Study Objectives*

The research aims to Determine the role of the digital economy in sustainable development. Achieving Sub-goals:

- Determining the role of the digital economy in reorganizing civil society to accomplish SDGs.
- Identifying the digital economy adequacies civil society groups need for sustainable development.
- Identify the digital economy's barriers to sustainable development.



### *The Importance of Research*

1. This study's importance originates from the role of the digital economy, which affects many areas of life, including sectors and civil society organizations, as well as the importance of adopting implementation projects.
2. This economy is trying to bring about fundamental changes in business and professions, which demands a new preparation of human resources appropriate to its nature and requirements.
3. The study's value originates from the adoption of this idea by civil society institutions and its inclusion in their development plans and vision in the digital economy, as well as the necessities facing development in the era of the digital economy, which the study reveals.

### *Concepts of the Study*

#### *Digital Economy*

Digital Economy has multiplied the terminology that defines the digital economy, and perhaps most of it refers to the same destination, and the designations of the new economy starting from the digital revolution, including the digital economy, the information economy, the digital economy, and the digital economy, which is largely dependent on the use of the

tools of the technological revolution of information and communication (Global Innovation Index, 2014).

The digital economy includes the use of digital information and knowledge as a vital factor for production, modern information networks as an important location of the activity, and the effective use of ICT as a significant engine for productivity increase and improved economic structure (World Economic Forum, 2019).

This term is based on three principles from a conventional point of view (Marvattallou, 2013):

- New products specified in the digital language (code and code) or based on knowledge, such as computer processors.
- The tools and techniques used, which have gone from mechanical to electronic to digital (encryption and information), manifest in computers and networks like the Internet.
- New dealing tools are represented by knowledge of product management using the given tools and processes, leaving a special number of products.

#### *The Concept of Sustainable Development*

The concept of development emerged at the beginning of economics as a scientific indication of the process of creating a set of radical structural changes in a particular society, intending to push society to continuous self-development that ensures the improvement of quality of life by Continuous rationalization of the optimal exploitation of available resources and ensuring the proper distribution of such exploitation proceeds (Ben Zidan, 2019). Sustainable development is "actual development that may continue and communicate from its use of natural resources through a strategy that takes environmental balance as a control." Thus, sustainable development is a "comprehensive term relating to the economic, social, institutional, and environmental components of society. Sustainable development aims to:

- Environmental integration involves integrating biosphere preservation into environmental societies' activity and protecting natural systems from environmental protection measures.
- Enhancing social justice entails improving quality of life, satisfying present and future human needs, giving job opportunities for all, and social services through involvement in decision-making.
- Improving economic activities means encouraging the optimal and rational management of human and natural resources by meeting the needs of society and the tolerance of enterprises towards consumers for the goods and services they produce.

#### *Previous Studies*

1. Raqami and Bushhangir (2012) compared Malaysia, Tunisia, and Algeria to determine the impact of ICT on sustainable development. The study intended to define the digital economy's idea, structure, importance, and characteristics of IT. The study's key findings are: The digital economy contributes to the production of scientific and technological knowledge content.
2. Pade (2016), "ICT Project Management Techniques for Sustainable ICT Projects in Rural Development (South Africa)" The report outlined the rural development framework. The researcher then discussed the relevance of the digital economy in rural development,



- especially in education, health, participation, environmental sustainability, and social networking.
3. Djeflat (2009), "Building knowledge economies for job growth, competitiveness, and balanced development." A study of Algeria, Morocco, Tunisia, Egypt, Jordan, and Saudi Arabia.
  4. Kalas and Spurk (2017), "Deepening engagement and boosting aid effectiveness through digital communication and ICT." A Swiss study. This study evaluates the contribution of ICTs to poverty reduction, social fairness, success, and recovery.
  5. This study aims to clarify the importance of the digital economy in achieving economic growth in the long term. It concludes that digital is the main engine of economic growth, that the digital economy ensures the continuation of economic development in the long term, and that continuous investment in education, innovation, communication, and information technology, Economic expansion increases its long-term sustainability.
  6. "The Digital Economy in African Countries" by Kamara *et al.* (2016) This study identified the urgent necessity for African countries to transition and grow the digital economy as the only and main means to achieve economic development and its sustainability in the long term because relying on permeability resources or oil did not achieve economic development for them.

#### *The Theoretical Framework of the Research*

##### *Characteristics and Objectives of the Digital Economy (Raziq, 2002)*

The digital economy builds an information society by using ICT to fulfill development goals. Digital economy advantages and traits include:

- Information has become a force in contemporary society in the digital revolution, therefore the information-based economic approach stresses intellectual and information wealth as a basic economic engine.
- The digital economy is based on a model that emphasizes human capacity and the value of knowledge and information.
- Knowledge and information stocks are key to economic balance.
- Conduct economic operations and initiatives online without individual or institutional movement.
- Circulating electronic contracts requires guarantees and a safe environment to accomplish economic transactions.
- The digital economy is tied to changes in the industrial environment, especially in ICT, therefore technological potential is key to its birth and development.
- Digital globalization and the Internet have created a borderless economy, and rising countries are battling industrial giants to reach consumers worldwide.
- Computers and digital communications will fuel the digital economy. These industries will be more profitable globally. The digital economy is achieved by firms and institutions through the benefits of ICT.

##### *Among These Goals (Abdel-Rahman, 2010)*



- The removal of geographical barriers
- Remove time barriers
- Better handling of cost constraints
- The breakdown of structural barriers.

#### *Indicators for Measuring the Digital Economy According to Jassim (2010)*

- Businesses' utilization of sophisticated technologies and e-commerce.
- Changes in market structure and operations, including how products and services are offered and local and international competition.
- Economic and societal uses of the ICT revolution, such as increased productivity through IT investment.
- The demographic characteristics of society in light of the digital economy, and based on continuous development, change, and dynamics of the digital economy, these indicators are no longer sufficient to measure and define the effects of the digital economy on society, the state, and the world, so it has been modified.

#### *To Become the Following (Brynjolfsson & Kahin, 2000)*

##### *Infrastructure*

The digital infrastructure's hardware (tools) and software (digital) must be measured.

Computers, phone lines, switches, fiber-optic cables, satellites, and wired and wireless networks.

Measure the digital infrastructure's age and degradation.

##### *E-commerce*

E-commerce is measured by the amount and pattern of B2B and institution-to e-consumer transactions (B2C). Digital and non-digital goods and services must be measured separately. Digital products skip distributors and merchants to reach the consumer directly. Due to higher fixed costs and lower marginal costs, digital items may have non-linear pricing. In addition to measuring e-commerce volume for other objectives (customer service, public information, and product advertising), the impact of improvements must be measured. Firm and Industry Structure relates IT, software, and the Internet to company and market structure. Location changes (localization), industry, size, and organizational structure of a business, as well as the mix of inputs (capital, labor, stock, and its relationship to other organizations), must be identified (Al-Asraj, 2017).

#### *Characteristics of the Workforce*

Demographic and labor market characteristics of digital economy participants must be contrasted to non-participants. Salary, assets, education, occupation, sex, race, age, and place of residence are economic and demographic factors.

#### *Pricing*



The elements that cause price deflation must be adjusted to reflect the impact of information technology on quality.

This will improve group measurements. Measuring the price variance between goods and services offered in different ways (e-commerce versus traditional techniques) and between producers using the same method is important for understanding the economy (Muhammad, 2008).

#### *Digital vs. Conventional Economy*

Traditional and digital economies differ dependent on the capabilities of the economy, business, customers, and government.

#### *Digitization Factors*

Knowledge and creativity are more important than natural resources in the digital economy.

This describes the global economy's shift toward a digital economy rather than a productive one.

This tendency may continue.

#### *First, Digital Economy Drivers*

Many factors have pushed and continue to push the digital economy forward.

It's hard to separate the truth into cause and effect (Farid, 2017).

#### *Globalization*

Globalization has created a borderless economy, as the market is no longer limited to one country. European countries became a tremendous economic force through the EU.

#### *MNCs*

Multinational firms monopolize the world's key technologies, including ICT. These breakthroughs and technologies are significant engines of the digital economy (De Decker, 2009).

#### *The Scientific-Technological Revolution*

Digital economy and technology go hand-in-hand. Technology is one of its most crucial driving forces since technocratic retreat fuels technical advancement. And the driving force for a group of economic and social issues, where modern technology has contributed as a foreseeable example in the development of science and its technological applications very quickly (Al-Shamal, 2012).

#### *The Digital Economy's Impact on Economic Indicators*

The digital economy positively affects economic development indicators, as the transition to a knowledge economy leads to an increase in the per capita share of the gross national product, as well as structural changes favoring knowledge sectors and employment.

- *Index of Per Capita Gross National Product*



The digital economy has led to the development of economic activities by increasing their reliance on knowledge, innovation, and innovation, which has led to new job prospects for individuals with this knowledge (Jelassi, 2010). These jobs are characterized by better pay, which means an increasing proportion of Per capita income or production, which maximizes social welfare and economic development, as analysts estimate that more than (50%) of GDP in OECD countries originates from digital-based sectors (De Decker, 2009).

- *Structural Change Index*

The digital economy has led to structural changes in the economy, as the output of digital economy sectors has risen compared to the overall gross national product and the earnings of knowledge workers have risen relative to the rest of the workforce or the total number of workers. Economic development involves structural changes, low unemployment, and inflation (Al-Maliki & Obaid, 2014).

- *Development Index*

In its 1990 World Report, the United Nations Program defined human development as "a process of expanding individuals' choices, and these options may be absolute or change over time, but the three basic options at all levels of development are for individuals to live long, healthy lives and acquire the resources for a decent standard of living, but development does not end there, as additional options range from politics to religion (Muhareb, 2011). High digital economy indicators connect with growth. Sweden, leading in digital economy measures, ranks 10th (2018). Finland ranks second in digital economic indices and twenty-second in global development, behind Denmark and the Netherlands. Norway's digital economy is sixth and its development index is first.

- *Sustainable Development Measurement Index*

At the Stockholm Conference in 2007 and with the publication of the Global Commission on Environment and Sustainable Development of the Brundtland Commission in 1987, the term sustainable development was adopted in a form. Durable, formal (Talib & Al-Janabi, 2009).

The transformation to the digital economy guarantees the achievement of sustainable development for the following reasons (Batuh & Banaga, 2018; Yusuf *et al.*, 2021)

- It relies mostly on knowledge as an inaccessible economic resource and a critical ingredient in achieving economic progress.
- Some countries can benefit from the digital economy's growth and transition.
- Whose development depends on polluting or unprofitable enterprises.
- Sustainable development.
- The absence or decrease of expenditures or costs to compensate for the negative impacts of environmental abuse, which are in most cases very large and hamper economic development efforts.

### *Recent Economic Indicators*



Some modern indicators evaluate economic progress over time and the frequency and continuity of changes, especially the spread of knowledge and technology and the increase in innovations.

*Examples of These Indicators Include (Ashour & Koueider, 2010)*

*Digital Infrastructure Readiness Index (Digital Component)*

This statistic examines how these technologies affect economic growth and prosperity, as well as the link between digital preparedness and global competitiveness. It also identifies barriers that prohibit governments, individuals, and corporations from maximizing these technologies' benefits. Its impact is political and societal, not simply economic. Mobile phones have let rural populations simply and cheaply reach markets. Internet and cheap computers have revolutionized education worldwide. These technologies boosted cooperation, creativity, and inventiveness. Men leaders The economy knows it must promote technology use and benefit distribution. Society, 2001's index. It measures ICT deficiencies. Technology communication involves 115 countries. Al-Nuaimat: information, ICT community readiness (individuals, companies, governments), ICT use (Al-Nuaimat, 2009).

*Global Competitiveness Index*

The Global Competitiveness Index (2017) includes (133) nations and ranks them based on their economic growth and development.

Institutions, infrastructure, macroeconomic stability, health, and basic education, and the group of enhanced efficiency incentives, comprising higher education and training, market efficiency, labor market efficiency, financial market development, technology preparedness, and market size.

Innovation and Sophistication Factors include corporate environment evolution and innovation (Fella & Fawzia, 2018). High digital economy indicators are also high global competitiveness indicators



*Elements of a Digital Economy*

To achieve development and be able to enable its goals, attention must be paid to the components and dimensions of the digital economy, the most important of which are:

- The information and communication infrastructure of any country is the most important factor in determining its ability to move to the digital economy, and statistics show that more than 50% of the GDP in developed countries (OECD countries) is based on digital, where electronic trade exchanges increase. And costs drop (Al-Bashir, 2018; Alhammadi *et al.*, 2021).
- The role of the digital economy in the growth of global trade: When the economy transformed into digital information by generating, processing, distributing, and exploiting (using) information, it created a kind of rapid diversification of products day after day, as the Internet, for example, changed many economic concepts and affected a large number of sectors (Al Mahrouq, 2018).
- The digital economy's involvement in increasing inventions: Information development and



cost reductions have substantially improved knowledge creation and dissemination. The number of inventions is a key indicator of knowledge and technology's impact on development (Zayed *et al.*, 2019).

The digital economy is one of the most effective tools for problem-solving, education, and planning, but also for driving societal change and making key decisions that contribute to sustainable development (El-Hady, 2018).

- Supporting national plans for education and development and improving the lives of researchers.
- Focusing on information and communication infrastructure to build a knowledge-based society and economy.
- Keeping abreast of technological changes to keep pace with informational, communication, scientific, and cognitive changes
- Closing the information gap through the expansion of the use of the Internet.

## MATERIALS AND METHODS

The study curriculum describes the study population, the sample, the study tool (the questionnaire), how it was designed, how to assure its validity and reliability, and the statistical procedures used to analyze the data. 1) In the current study, the researcher used the descriptive approach (survey), which is based on collecting information and data about a phenomenon, an event, something, or reality, to identify the phenomenon studied, determine its current situation, and identify its strengths and weaknesses, to know the validity of this situation or the need to make partial or fundamental changes in it. 2) Study population and sample The study population includes 12 digital economy institutions and economic specialists Community-wide.

### *Study Tool*

The five-point scale study tool was delivered to 35 workers in the digital economy.

## RESULTS AND DISCUSSION

### *Results Related to the First Question*

**Table 1** displays the arithmetic average of the role of the knowledge economy in reforming organizations' activity to achieve sustainable development (3.68) and its standard deviation (1). (0.79).

**Table 1.** Arithmetic means and standard deviations for the areas of the role of the knowledge economy in restructuring the work of organizations to achieve the goals of sustainable development

Number	The paragraphs	SMA	Standard deviation	Rank
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1.	The digital economy leads to the development of human resources	4.16	1.09	1
2.	Sustainable development achieves the adaptation of the human resource to modern technology in light of the digital economy	4.04	1.22	2
3.	Sustainable development defines a clear strategy for training that helps the digital development of the economy	3.99	1.50	3
4.	Sustainable development programs support the development of the digital industry	3.96	1.58	4
5.	Sustainable development depends on teaching the production and generation of digital knowledge in the economy	3.94	1.51	5
6.	Sustainable development depends on research programs that lead to economic development.	3.93	1.60	6
7.	The digital economy focuses on continuously improving the performance of the human resource	3.89	1.29	8
8.	The digital economy helps rethink training and institutional development programs	3.88	1.29	8
9.	Sustainable development helps in the continuous rehabilitation of technological resources and capabilities	3.87	1.26	9
10.	The digital economy increases the skill level of the resource in the labor market	3.86	1.28	10
11.	The digital economy creates a spread of sustainable development that promotes the balanced exploitation of wealth	3.86	1.63	10
12.	The digital economy creates economic growth within enterprises	3.58	1.28	11
13.	The digital economy uses a strategy for administrative planning and development	3.85	1.21	11
14.	The digital economy helps diversify the sources of information society needs	3.83	1.23	12
15.	The digital economy helps build various programs to develop areas of sustainable development	3.83	1.22	12
16.	Sustainable development in light of the digital economy requires increased rates of economic growth	3.81	1.30	13
17.	The digital economy increases resilience to environmental imbalances	3.80	1.40	15
18.	The digital economy works by developing technology to conserve environmental resources in the long term	3.79	1.55	16
19.	The digital economy works through technology development to alleviate environmental stress	3.76	1.19	17
20.	The digital economy promotes innovation and creativity in the field of sustainable development	3.76	1.21	17



The average minimum rank for the tool as a whole was (45) for Paragraph No. (43), where its arithmetic means was (3.41) with a standard deviation (1.53) and the number of paragraphs for the fields that answered the inquiry. How does the knowledge economy help organizations accomplish sustainable development goals? Average-scoring phrases are (9) and (11.6). No expressions were minor, and the average was crucial. The lowest rank (3.41) means the average degree is high. Best phrase: "Sustainable development provides a clear strategy for

digital training" (4.16), and its standard deviation was (0.41). (1.09). 18 was third and I got a mean (of 3.99) and a standard deviation (of 1.50).

All of the tool's words were rated highly, with an arithmetic mean of 3.68, showing the importance of the digital economy in reorganizing digital economy institutions' activities to fulfill sustainable development goals.

#### Results Related to the Second Question

**Table 2** shows that the competencies that institutions should have in the digital economy include 14 statements, which is 1.78 of the tool statements.

**Table 2.** What are the competencies that institutions should have in the era of the digital economy?

Number	The paragraphs	SMA	Standard deviation	Rank
1.	The digital economy helps to reconsider qualification and training programs to develop human resources	4.06	1.09	1
2.	The digital economy uses technical means to train enterprise workers	3.92	30	2
3.	The digital economy helps increase the skill level of the resource in the labor market	3.84	1.31	3
4.	The digital economy requires a more flexible education and training strategy	3.76	4.37	4
5.	Digital economy helps technology form drivers of social growth Sustainable development in light of the digital economy means effective participation in decision-making	3.75	1.45	5
6.	The digital economy helps improve access to health services	3.69	0.84	6
7.	The digital economy seeks development based on the good management of resources	3.68	1.25	7
8.	The digital economy through technology development leads to the long-term conservation of environmental resources	3.68	1.28	7
9.	The digital economy for sustainable development events works on the radical exploitation of resources and directing investments	3.67	12.36	9
10.	The digital economy depends on a strategy for administrative planning and development	3.66	1.35	10
11.	The digital economy helps teach the production and generation of digital knowledge	3.65	1.31	11
12.	The digital economy helps diversify the information sources needed for human resource development	3.57	1.36	12
13.	The digital economy leads to the production and updating of digital knowledge	3.55	1.24	13



14.	The digital economy leads to the development of innovation and creativity in the human element	3.49	1.37	14
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The arithmetic averages of the competencies range from 3.37 to 4.06, with No. 1 having the highest average and standard deviation. No. 2 has the lowest arithmetic averages, 3.37 and 1.36. The arithmetic mean of the whole sum of digital economy competencies is 3.68, and its standard deviation is 0.84, suggesting improvement.

#### *Results Related to the Third Question*

**Table 3** shows the economic, social, administrative, planning and environmental issues are listed. No. 10 "The digital economy needs continual adjustments in legislation and job programs" and No. 11 "The digital industry always needs training means" are equally valid. Unique kind and the difficulty of optimally exploiting natural resources for sustainable digital economy development, with an arithmetic average of 1 and a ratio of 14% after 8 rounds. Phrase 1 conveys "the lack of human capacity in dealing with the digital economy," whereas Phrase 2 expresses "the issue of adapting society to technology." Also, No. 5, analyses social systems' environmental vulnerability. Phrase 6: "Social systems' problems in the digital economy" "Digital economy's weak reliance on humans" and "Tanli" The digital economy reduces poverty by 0.88 and 12%.

**Table 3.** What are the challenges facing sustainable development in the era of the digital economy?

Number	The paragraphs	SMA	standard deviation	Rank
1	Weak human capacity in dealing with the digital economy	7	%37	2.33
2	The difficulty of societies adapting to technical development	7	%37	2.33
3	The difficulty of eradicating poverty in order to achieve sustainable development in light of the digital economy	5	%26	1.66
4	The difficulty of exploiting natural resources, the optimum utilization as a requirement to achieve sustainable development in light of the digital economy	8	%14	1
5	The difficulty of social systems' ability to withstand environmental differences in light of the digital economy	7	%12	0.88
6	Development in the era of the digital economy faces the difficulty of mastering technology	7	%12	0.88
7	Weak reliance of the digital economy on the traditional human factor	7	%12	0.88
8	The difficulty of adopting sustainable development to meet the needs of the present without compromising the capabilities of future generations in light of the digital economy	6	%10	0.75
9	The process of sustainable development in light of the digital economy requires the introduction of concepts of poverty reduction	8	%14	1
		7	%12	0.88



10	The digital economy needs constant adjustments to the institutions 'work regulations and programs	8	%14	1
11	The digital economy always needs special and unique training methods	8	%14	1
12	The digital economy always requires matching training programs with the needs of the digital market	7	%12	0.88
13	The digital economy requires the ability of the institution to compete internationally	7	%12	0.88

## CONCLUSION

Some conclusions were drawn about its role in achieving sustainable development, from which many developing countries could benefit.

**ACKNOWLEDGMENTS:** The authors would like to thank the Deanship of Scientific Research at Umm Al- Qura University for supporting this work by Grant code :(22UQ4331100DSR01)

**CONFLICT OF INTEREST:** None

**FINANCIAL SUPPORT:** None

**ETHICS STATEMENT:** None

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