

THE EVOLUTION OF THE DIGITAL ECONOMY IN ROMANIA IN THE PERIOD 2019-2022

TOMA SORIN-GEORGE

*PROFESSOR, FACULTY OF BUSINESS AND ADMINISTRATION,
UNIVERSITY OF BUCHAREST, BUCHAREST, ROMANIA*

e-mail: sorin.toma@faa.unibuc.ro

GRĂDINARU CĂTĂLIN

*LECTURER, FACULTY OF ADMINISTRATION AND BUSINESS,
UNIVERSITY OF BUCHAREST, ROMANIA*

e-mail: catalin.gradinaru@faa.unibuc.ro

MODREANU ANDRA

PhD STUDENT, THE BUCHAREST UNIVERSITY OF ECONOMIC STUDIES

e-mail: andra.modreanu@faa.unibuc.ro

Abstract

The digital economy has become a key issue for both theoreticians and practitioners worldwide, especially in the last decade. It is based on various forms of technology, such as the Internet of Things, artificial intelligence and blockchain. The aim of the paper is to briefly present and analyse the evolution of the digital economy in Romania in the period 2019-2022. In this respect, the authors used a qualitative research method. The results show that the period 2019-2022 witnessed a slight decrease in Romania's performance related to the Digital Economy and Society Index. The paper indicates that despite its efforts, Romania has scored well below the other EU countries. However, the adoption of several measures in favor of digitalisation proved its clear commitment to building a functional digital economy.

Keywords: *digital economy, Digital Economy and Society Index, digitalization, human capital, European Union, Romania*

Classification JEL: *F00, F01*

1. Introduction and context of the study

Since the beginning of the era of artificial intelligence (AI), the digital economy has become a key issue for both theoreticians and practitioners worldwide. Derived from the incessant changes that have taken place in information and communications technology (ICT), the digital economy is based on various forms of technology, such as the Internet of Things (IoT), AI, and blockchain (Nguyen, 2023). In 2021, the digital economy represented 10.3% of the gross domestic product (GDP) in the United States of America (USA) or \$2.4 trillion (Bureau of Economic Analysis, 2022). At a global level, the digital economy made up more than 15% of the global GDP in 2022 (Devi, 2023).

In the past decades, technology has proved to constitute one of the pillars of economic growth. This is why the adoption of new technologies (e.g., business intelligence, cloud computing, social media) has deeply transformed economic activity all over the world. As most companies and countries are massively investing in technology, they embrace the digital economy with open arms.

The digital economy has increasingly come of age and all industries have undergone profound digital transformations. The COVID-19 pandemic forced organizations, irrespective of their size and sector, to enter the digital world (World Economic Forum, 2023). In this respect, 53%

of the enterprises operating in the European Union (EU) made important steps in becoming more digital in 2022 (European Investment Bank, 2023). However, there are appreciable differences between countries within the EU. As an EU Member State, Romania has made little progress in becoming more digital (European Commission (EC), 2023c).

Starting from these considerations this research raises the following question: How did the digital economy evolve in Romania in the period 2019-2022? Thus, our paper aims to briefly present and analyse the evolution of the digital economy in Romania in the period 2019-2022. In this respect, the authors used a qualitative research method. The structure of the paper is as follows: the second chapter deals with the literature review. The third chapter presents the research methodology. The results of the research are discussed in the fourth chapter. The conclusions are placed at the end of the paper.

2. Literature review

The concept of digital economy was coined by Don Tapscott in 1996. Since then its numerous definitions have emerged in the literature without reaching a consensus. The digital economy is “that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services” (Bukht and Heeks, 2017, p. 13) or “the economic activities that emerge from connecting individuals, businesses, devices, data and operations through digital technology” (Yasar and Pratt, 2023, p. 1). According to the Organisation for Economic Co-operation and Development (OECD), the digital economy incorporates “all economic activity reliant on, or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, digital services and data” (2020, p. 34).

The so-called “Members States’ progress on digital” has been evaluated through the Digital Economy and Society Index (DESI) by the EC since 2014 (EC, 2019; EC, 2020; EC, 2021; EC, 2022). As an indicator of the digital economy, the DESI comprises four dimensions as follows (Table no. 1):

- human capital,
- connectivity,
- integration of digital technology,
- digital public services (EC, 2022).

Table no. 1. DESI structure

No.	Dimension	Subdimension
1	Human capital	<ul style="list-style-type: none"> ▪ Internet user skills ▪ Advanced skills and development
2	Connectivity	<ul style="list-style-type: none"> ▪ Fixed broadband ▪ Mobile broadband
3	Integration of digital technology	<ul style="list-style-type: none"> ▪ Digital intensity ▪ Digital technologies for businesses ▪ e-Commerce
4	Digital public services	<ul style="list-style-type: none"> ▪ e-Government ▪ e-Health

Source: EC, 2023a; EC, 2023b

The Human capital dimension rates two types of skills: the Internet user skills of citizens and the advanced skills of specialists. The Connectivity dimension is related to fixed and mobile broadband and uses indicators that measure supply, demand and retail prices. The Integration of

digital technology dimension is close to the business domain and refers, among others, to the enterprises that use social media, Big data, cloud computing, enterprise resource planning (ERP), AI, and e-commerce. Facing tough hyper-competition worldwide (Toma, 2005; Toma and Marinescu, 2015) in the age of globalization (Toma, 2013), today’s successful business organizations are those who integrate digitalization into their current activities and processes (Tohănean et al, 2018; Toma and Tohănean, 2018), being also characterized by a plethora of features, such as strategic orientation (Toma and Grădinaru, 2016; Toma et al, 2016a; Toma et al, 2016b), competitive strategies and business models (Cornescu et al, 2004; Toma and Tohănean, 2019), entrepreneurial mindset (Grădinaru et al, 2016; Marinescu et al, 2017; Zainea et al, 2020) and creativity (Toma et al, 2018), total quality management (Toma, 2006; Toma and Naruo, 2009), lean thinking (Naruo and Toma, 2007; Marinescu and Toma, 2008), and social responsibility (Toma et al, 2011; Imbrișcă, and Toma, 2020) and corporate citizenship (Toma, 2008). Finally, the Digital public services dimension takes into account both the access to electronic health records and the supply and demand of e-government.

3. Methodology

In order to attain the aim of the paper, the authors used a qualitative research method. The needed information was gathered through desk research. In the beginning, the authors identified the main secondary sources of data, such as articles, books and reports, from the domains of economics, ICT and management. Then, they analyzed and classified the information in a database. After that, the authors synthesized the needed information and elaborated the paper.

4. Results and discussion

The period 2019-2022 witnessed a slight decrease in Romania’s performance (Table no. 2) related to the DESI. The human capital dimension remained its weak point as the country fell behind the European Union (EU) average.

Table no. 2. The evolution of the DESI in the period 2019-2022: the case of Romania

Year	Romania	
	Rank	Score
DESI 2019	26	36.5
DESI 2020	26	40
DESI 2021	27	32.9
DESI 2022	27	30.6

Source: EC, 2023c

Last year, regarding the Human capital dimension of the DESI, Romania ranked the last (27th) in the EU (EC, 2022). The main reason is the lack of basic ICT skills of the vast majority of the Romanian population. In spite of the increasing number of ICT specialists, their proportion in employment is far below the EU average: 2.6% in comparison with 4.5% (EC, 2023c).

The Connectivity dimension revealed a much better position for Romania in 2022: the country occupied the 15th place in the EU (EC, 2022). The fixed broadband coverage surpasses 94% for total households whereas the 5G deployment within the mobile connectivity remains low in comparison to the EU average (EC, 2023c).

The Integration of digital technology dimension was poorly represented in Romania, placing the country on the last place (27th) in the EU (EC, 2022). In this line, the integration of AI, big data and cloud computing in the activities and processes of enterprises is very poor (EC, 2023c).

Romania obtained the same low performance in the Digital public services dimension in 2022: the country occupied the last place in the EU (EC, 2022). The availability of digital public services for both citizens and enterprises is far below the EU average (EC, 2023c).

In spite of the fact that digitalization has constituted a priority for Romanian policymakers in the last few years, the country occupied the 26th place in the period 2019-2020 and the 27th place in the period 2021-2022. Some of the reasons were the following:

- The lack of a clear strategy regarding the digital economy in Romania.
- The frequent governmental changes.
- The exodus of Romanian high-qualified professionals.
- The poor infrastructure.
- The relatively low investments in digitalization.

5. Conclusions

In the past decades, the digital economy has become an important topic of discussion for policymakers, researchers, and practitioners. Its contribution to the creation of the GDP has continuously increased, especially during the pandemic period.

The paper showed that despite its efforts, Romania has scored well below the other EU countries in the digital economy. However, the adoption of several measures in favor of digitalization proved its clear commitment to building a functional digital economy.

Further researches may benchmark the performance of Romania with other EU Member States.

6. Bibliography

[1] **Bukht, R., Heeks, R.**, Defining, conceptualising and measuring the digital economy, Manchester Centre for Development Informatics, Working Paper, 68, pp. 1-24, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431732, 2017;

[2] **Bureau of Economic Analysis**, How big is the digital economy? 22.11.2022, <https://www.bea.gov/data/special-topics/digital-economy>, 2022;

[3] **Cornescu, V., Curteanu, D., Marinescu, P., Toma, S.-G.**, Management from Theory to Practice, University of Bucharest Publishing House, Bucharest, 2004;

[4] **Devi, A.**, DCO 2030: Digital economy to contribute 30% of global GDP and create 30 million jobs by 2030, 05.02.2023, <https://www.edgemiddleeast.com/business/dco-2030-digital-economy-to-contribute-30-of-global-gdp-and-create-30-million-jobs-by-2030>, 2023;

[5] **European Commission (EC)**, Digital Economy and Society Index (DESI) 2019, 11.06.2019, <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2019>, 2019;

[6] **European Commission (EC)**, Digital Economy and Society Index (DESI) 2020, 11.06.2020, <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2020>, 2020;

[7] **European Commission (EC)**, Digital Economy and Society Index (DESI) 2021, 12.11.2021, <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2021>, 2021;

[8] **European Commission (EC)**, Digital Economy and Society Index (DESI) 2022-Thematic Chapters, 28.07.2022, <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2022>, 2022;

- [9] **European Commission (EC)**, Digital Economy and Society Index (DESI) 2022-Methodological note, 27.09.2023, <https://digital-strategy.ec.europa.eu/en/policies/desi>, 2023a;
- [10] **European Commission (EC)**, DESI 2023 methodological note, 27.09.2023, <https://digital-strategy.ec.europa.eu/en/library/desi-methodological-note-digital-decade-report-2023>, 2023b;
- [11] **European Commission (EC)**, Romania in the Digital Economy and Society Index, <https://digital-strategy.ec.europa.eu/en/policies/desi-romania>, 2023c;
- [12] **European Investment Bank**, Digitalisation in Europe 2022-2023, https://www.eib.org/attachments/lucalli/20230112_digitalisation_in_europe_2022_2023_en.pdf, 2023;
- [13] **Grădinaru, C., Toma, S.-G., Papuc, R.**, Entrepreneurship in the world: The analysis of the Global Entrepreneurship Index in the period 2015-2017, *Ovidius University Annals: Economic Sciences Series*, XVII(2), pp. 14-18, 2017;
- [14] **Imbrișcă, C., Toma, S.-G.**, Social responsibility, a key dimension in developing a sustainable higher education institution: The case of students' motivation, *Amfiteatru Economic*, 22(54), pp. 447- 461, 2020;
- [15] **Marinescu, P., Toma, S.-G.**, Implementing lean management in the Romanian industry. In: T. Koch, ed., *Lean Business Systems and Beyond*, Springer, New York, NY, pp. 269-276, 2008;
- [16] **Marinescu, P., Toma, S.-G., Miulescu, G.-F., Grădinaru, C.**, Entrepreneurship: from education to innovation, *Manager*, 26, pp. 146-156, 2017;
- [17] **Naruo, S., Toma, S.-G.**, From Toyota Production System to Lean Retailing: Lessons from Seven-Eleven Japan. In: J. Olhager and F. Persson, eds., *Advances in Production Management Systems*, Springer, New York, NY, pp. 387-395, 2007;
- [18] **Nguyen, O.**, Digital economy and its components: A brief overview and recommendations, MPRA Paper 116110, pp. 1-10, <https://mpra.ub.uni-muenchen.de/116110/>, 2023;
- [19] **Organisation for Economic Co-operation and Development (OECD)**, A Roadmap Toward a Common Framework for Measuring the Digital Economy, <https://www.oecd.org/sti/roadmap-toward-a-common-framework-for-measuring-the-digital-economy.pdf>, 2020;
- [20] **Tapscott, D.**, *The Digital Economy: Promise and Peril in the Age of Networked Intelligence*, McGraw-Hill, New York, 1996;
- [21] **Tohănean, D., Toma, S.-G., Dumitru, I.**, Organizational performance and digitalization in Industry 4.0, *The Journal of Emerging Trends in Marketing and Management*, 1(1), pp. 282-293, 2018;
- [22] **Toma, S.-G.**, Fordism, postfordism and globalization, *Amfiteatru Economic*, 7(17), pp. 135-138, 2005;
- [23] **Toma, S.-G.**, From quality to the corporate social responsibility, *Amfiteatru Economic*, 8(20), pp. 145-149, 2006;
- [24] **Toma, S.-G.**, Social responsibility and corporate citizenship in 21st century, *Amfiteatru Economic*, 10(23), pp. 80-85, 2008;
- [25] **Toma, S.-G., Naruo, S.**, Quality assurance in the Japanese universities. *Amfiteatru Economic*, 11(26), pp. 574-584, 2009;
- [26] **Toma, S.-G., Stanciu, C., Irimia, E.**, Landmarks in the evolution of social responsibility of organizations in the twentieth century, *Proceedings of the 5th International Scientific Session Challenges of the Knowledge Society*. Bucharest: PRO Universitaria Publishing House, pp. 1352-1360, <https://core.ac.uk/download/pdf/25886981.pdf>, 2011;
- [27] **Toma, S.-G.**, *Economia Întreprinderii*, Editura Universității din București, București, 2013;

[28] **Toma, S.-G., Marinescu, P.**, Strategy and change, *Manager*, 21(1), pp. 145-150, <https://ideas.repec.org/a/but/manage/v21y2015i1p145-150.html>, 2015;

[29] **Toma, S.-G., Grădinaru, C.**, From military strategy to business strategy, *Strategii Manageriale*, 31(1), pp. 227-233, <http://www.strategiimanageriale.ro/papers/160132.pdf>, 2016;

[30] **Toma, S.-G., Marinescu, P., Constantin, I.**, Approaches to strategic thinking in business organizations, *Proceedings of the 10th International Conference on Business Excellence*, Academy of Economic Studies, Bucharest, Romania, pp. 184-191, https://accord.edu.so/course/material/energy-and-climate-change-289/pdf_content, 2016a;

[31] **Toma, S.-G., Marinescu, P., Grădinaru, C.**, Strategic planning and strategic thinking, *Revista Economică*, 68(5), pp. 168-175, <http://economice.ulbsibiu.ro/revista.economica/archive/68515toma&marinescu&gradinaru.pdf>, 2016b;

[32] **Toma, S.-G., Tohănean, D.**, Internet of Things, digitalization and the future of business models, *Strategii Manageriale*, 4(42), pp. 130-137, 2018;

[33] **Toma, S.-G., Peptenatu, D., Andronache, I., Ahammer, H., Pintilii, R.-D., Draghici, C.-C., Simion, A. G.**, The creative economy in Romania, a key factor of economic integration in the European Union. In: Dima, A., ed., *Doing Business in Europe*, Springer, Cham, pp. 329-350, 2018;

[34] **Toma, S.-G., Tohănean, D.**, Green business models: The case of a German automaker, *Quality-Access to Success*, 20(S2), pp. 635-640, 2019;

[35] **Yasar, K., Pratt, M. K.**, Digital economy definition, 10.2023, <https://www.techtarget.com/searchcio/definition/digital-economy>, 2023;

[36] **Zainea, L. N., Toma, S.-G., Marinescu, P., Chițimea, A.**, Combating unemployment through social entrepreneurship in the European context, *Business Ethics and Leadership*, 4(4), pp. 85-98, 2020;

[37] **World Economic Forum**, Digital Transition Framework: An action plan for private-public collaboration, January 2023, https://www3.weforum.org/docs/WEF_Digital_Transition_Framework_2023.pdf, 2023.