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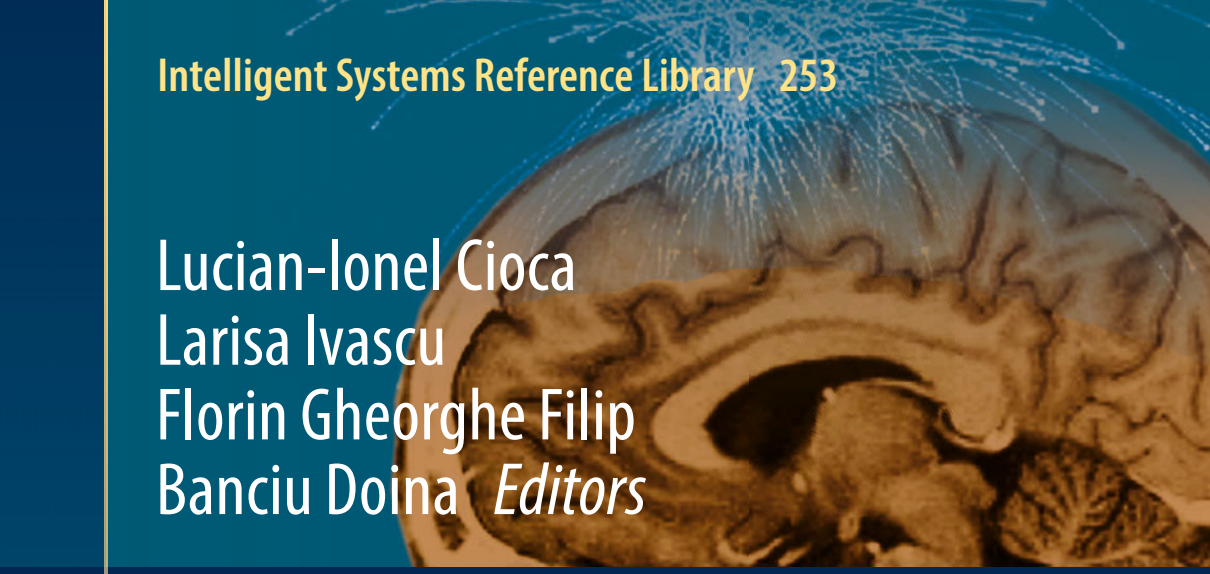

Lucian-Ionel Cioca
Larisa Ivascu
Florin Gheorghe Filip
Banciu Doina *Editors*

Digital Transformation

Technology, Tools, and Studies

Springer

Intelligent Systems Reference Library

Volume 253

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Editors

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Preface

Incorporating technologies into organizational processes has become a priority for all industries to lead to important changes. All these activities are covered by the digital transformation that can lead to increased efficiency, agility, innovation, and the unlocking of organizational values. This approach is present in all fields, being intensively addressed and debated by researchers, teachers, and practitioners. The value offered to customers in accordance with their expectations represents a fundamental change for the organization and can be achieved through digital transformation. This multidisciplinary volume integrates research from different fields of activity outlining a picture of digital transformation (DT).

Digital transformation is presented in more and more companies that want to innovate and improve their level of competitiveness. The use of different tools, methods, and techniques for DT can contribute to a complete approach to organizational processes and to their efficiency. Digital transformation involves the adoption and use of new digital technologies to develop new products and services; modify existing ones; and develop new business models to increase efficiency, productivity, and competitiveness. DT contributes to the generation of organizational benefits, among which are the efficiency of processes, the reduction of human errors, the increase of productivity, the efficiency of costs, and the increase of the level of competitiveness. Indeed, a series of organizational barriers can be identified in the organizational approach for DT. Among these barriers are competences, abilities, costs, and the limitation of some resources.

This volume addresses DT in different domains and areas of activity. Starting from marketing to culture and education to health, mobility, and human resources. The complexity of the volume is given by the multidisciplinary and complex approaches that are present in the 12 chapters.

Sibiu, Romania — Lucian-Ionel Cioca
Timisoara, Romania — Larisa Ivascu
Bucharest, Romania — Banciu Doina
Bucharest, Romania — Florin Gheorghe Filip

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About the Editors

Lucian-Ionel Cioca is a Full Professor at the "Lucian Blaga" University of Sibiu, since 2007. Since 2010 he is a Doctoral Advisor in Engineering and Management, and since 2012–present he is a member of the National Council for the Certification of University Titles, Diplomas and Certificates, the Commission for Engineering and Production Management, the Ministry of Education. Since 2017–present he is a member of the Specialized Certification Committee, the Ministry of Education, and since 2017–present he is a member of the Advisory Board for Research and Development and Innovation, the Ministry of Research, Innovation and Digitalization.

His research focuses on the following directions: management, human resources management, production systems engineering, ergonomics, circular economy, sustainability, occupational safety, and health management. He has published over 250 scientific papers, of which over 120 are indexed by Clarivate Analytics in the Web of Science.

He is the President of the Commission for Safety and Health at Work within the Romanian Academy of Scientists, the President of the Ardeleana Academy, and the Vice-President of the Institute for Research in Circular Economy and Environment "Ernes Lupan".

He is a professional membership: The Academy of Romanian Scientists, The General Association of Engineers in Romania, The Association of Doctoral and Excellence Activities in Business Engineering and Management, The German General Engineer's Association, The World Economics Association (WEA), United Kingdom, The Romanian Managers and Economical Engineers Association, and The Transylvanian Association for the Literature and Culture of the Romanian People.

Due to the recognition of his research, he is the Editor-in-Chief of the journal indexed in Web of Science and Scopus entitled: INMATEH—Agricultural Engineering (ISSN 2068-2239).

He is also an editorial board member of the following journals indexed in Web of Science, and Scopus: Polish Journal of Management Studies (ISSN 2081-7452), Quality-Access to Succes (ISSN 1582-2559), Sustainability (ISSN 2071-1050), and Safety (ISSN 2313-576X).

He is also an guest editor of the following journals indexed in Web of Science, and Scopus: Advances in Materials Science and Engineering (ISSN 1687-8434), International Journal of Environmental Research and Public Health (ISSN 1660-4601), Processes (ISSN 2227-9717), Sustainability (ISSN 2071-1050), and Safety (ISSN 2313-576X).

Larisa Ivascu (Ph.D. in Engineering and Management; MBA; B.A. Software Engineering) is a professor at Politehnica University of Timisoara, Romania, Faculty of Management in Production and Transportation, Department of Management, having more than 15 years of experience in programming, teaching, and research. She is the Head of the Entrepreneurship Office of Politehnica University of Timisoara and Director of Research Center for Engineering and Management. She is the President of the Scientific Committee of the Academy of Political Leadership and Vice-President of the Society for Ergonomics and Work Environment Management. She has extensive academic work: published 10 books, 10 chapters in national and international books, coordinated the editing of 4 books at internationally recognized publishing houses, and over 250 academic research studies or articles, being also part of international research bodies. She is a guest editor of important journals, a keynote speaker to various international and national events, being part of the national and international entrepreneur and academic projects.

More details can be found at: http://www.mpt.upt.ro/eng/research/pdf/CCIM/CV_Ivascu%20Larisa_eng.pdf.

Florin Gheorghe Filip was born in 1947. He graduated in Control Engineering at Politehnica Technical University of Bucharest in 1970 and received his Ph.D. degree from the same university in 1982. He was elected as corresponding member of the Romanian Academy in 1991 and became full member of the Academy in 1999. During 2000–2010, he was Vice-President of the Romanian Academy (elected in 2000, re-elected in 2004 and 2006). In 2010, he was elected President of the "Information Science and Technology" section of the Academy (re-elected in 2015 and 2019). He was the Managing Director of National Institute for R&D in Informatics-ICI Bucharest (1991–1997). His main scientific interests include optimization and control of large-scale complex systems, decision support systems, technology management and foresight, and IT applications in the cultural sector. He authored/co-authored over 350 papers published in international journals (IFAC J. Automatica, IFAC J Control Engineering Practice, Annual Reviews in Control, Computers in Industry, Large-Scale Systems, Technological and Economical Development of Economy, and so on) and contributed to volumes printed by international publishing houses (Pergamon Press, North Holland, Elsevier, Kluwer, Chapman & Hall, and so on). He is

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Banciu Doina a Full Professor at the University of Bucharest, Ph.D. in Systems Engineering (Politehnica University of Bucharest, 1989), is Vice-President of the Romanian Academy of Scientists, President of the Scientific Council of the National Institute for Research and Development in Informatics, ICI Bucharest (from 2017), member of the National Commission of Libraries since 2017, Director General of the National Institute for Research and Development in Informatics, ICI Bucharest (2001–2016), and member of the National Commission of Libraries (since 2017). She has numerous theoretical contributions regarding the computerization of public administration and libraries; effectively participated in the computerization of the National Library of Romania, the Carol I Central University Library as well as several information and documentation institutions. She is a NATO, European and national evaluator for ICT research projects. She has written 18 books and over 200 articles published in the country and abroad. She received the "Tudor Tănăsescu" award of the Romanian Academy, as well as numerous other national and international awards. She also received the title of Doctor Honoris Causa from several universities. She represented Romania in international working groups, and she led national and international research programs and projects; she was decorated with the Order of Faithful Service in the rank of knight.

Chapter 1
Drivers for Sustainable Digital Transformation in Public and Private Organizations

Florin Dragan, Lakhmi C. Jain, and Larisa Ivascu

Abstract Digitization, digitalization and digital transformation (DT) are important for public organizations and private organizations. Despite their importance, these steps are approached differently in organizations. Public organizations emphasize the importance of digital transformation, while public organizations make efforts to align themselves with citizens' demands from a digitalization perspective. So far, no study has presented (1) to what extent this transformation is underway and (2) what are the determining factors with particular emphasis on Romanian cases. This research was carried out in two directions: research carried out for public organizations and research carried out for private organizations. The research is completed with comparative assessments of digitization and digital transformation in public and private organizations. The results show that public organizations are intensively involved in the digital transformation, while public organizations try to find solutions to the various barriers and are at an average level of digitalization. The research concludes with future research directions and research limitations.

Keywords Sustainability · Organizational transformation · Digitization · Digitalization · Digital transformation · e-government

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1.1 Introduction

Nowadays, digital technologies and digital tools are used in organizational processes and activities. The present studies show a high degree of digitization in the private and public sector. Digitization is happening successfully in private organizations, and public institutions are undergoing digitization [1–5]. Digital transformation is desired in the private sector, which is also a possible approach in the public sector. In the private sector, there are certain fields of activity that are at a high level of digitization, and some in which there is the possibility of improving the activity [6–11]. The public sector is made up of government and government-controlled enterprises and constitutes a part of the economy. This sector does not include private organizations, non-governmental organizations or other forms coordinated by individuals or companies. The private sector is the part of the economy that is not controlled by the state and is run by individuals and other entities [12–14] Private organizations sell tangible and intangible products (services) to generate revenue and income. Public organizations have as a secondary goal the achievement of positive financial results. The purpose of these public organizations is to contribute to the welfare of society and to develop products and services for the public [15–18].

Digitization is a fundamental process that consists in the conversion of physical (analog) elements into digital ones and organizes information into data units called bits. It is a very important process for digital technologies and represents the next step for digitization [19–23]. Practically, we cannot talk about digitization and digital transformation without the digitization process at the novel organizational level [14, 24, 25]. The digitization process consists in storing information and elements in computers, without changing their form. In practice, a conversion of hard/paper files or documents into digital documents is carried out. Digitization also realizes data recording. The result of the digitization can be an image, a sound, a document, a file, a signal. Here you can exemplify the scanning of a document and its storage on the computer [26, 27]. After placing the document on the computer, this digitization process ends. Digitization is the process by which processes are developed and workflows are changed to improve manual systems. Digitization uses digital technologies to change a business model and provide new financial results, improving organizational value and other targeted indicators [27]. An example in this sense would be the use of digitized data of buyers or individuals from different sources to automatically generate information from their behavior and use it in organizational marketing activities. Digital transformation involves the adoption and use of new digital technologies to develop new products and services, modify existing ones and develop new business models to increase efficiency, productivity and competitiveness [11–14].

In Table 1.1, an analysis of the important aspects for digitization, digitalization and digital transformation is carried out using specialized literature [4, 6–12, 28–31]. The main aspects and results obtained are:

- *Definition*—The definitions are different. These concepts are related to each other and cannot talk about digital transformation without digitization or digitization.

Table 1.1 Bottom line: digitization, digitalization, and digital transformation

Aspect	Digitization	Digitalization	Digital transformation
Definition	Digital representation of objects or attributes	The use of digital technologies and digitized data to activate or improve organizational processes	The digital transformation of the organization through the implementation of digital technologies
Input	Physical objects, physical files or documents or physical attributes	Digitized data, digital technologies	Organizational processes, digital technologies
Output	Digital files or document	Transformed organizational processes	Innovative organizational processes
Everyday efficiency	Reducing workload	Increasing efficiency through digital processes	Improving organizational capacity and obtaining immediate answers
Organization benefits	Reduction of workload and loss of information	Improvement of processes, reduction of organizational losses	Increasing organizational competitiveness
Transmission	The ease of storing digital information, the reduction of organizational resources	Ease of use of digital information, reduction of organizational resources	Ease of processing and optimization of digital information, reduction of organizational resources
Tech drivers	Systems for converting analog data into digital data. These drivers exist in most organizations and are basic elements in the current technological evolution	New business opportunities by improving operations using new technologies such as artificial intelligence (AI), big data, robotics and the Internet of Things (IoT)	New business models by improving processes and adopting innovative technologies. Technologies advance rapidly and digital transformation must use them
Comprehensive strategy	The digitization strategy requires changes in the organizational culture, vision, mission and strategic objectives	It includes emerging technologies for streamlining core operations to create value for stakeholders	Innovative strategies that include all organizational resources and innovative technology to develop new business models
Productivity	The first steps are being taken to increase productivity	Organizational productivity is increasing and there are fewer scraps	Productivity can reach optimal limits

Digitization realizes the conversion of the data. Digitalization involves improving processes with digital solutions, and digital transformation uses technology for new business models.

- *Input*—The entrances are different and present in the waterfall.
- *Output*—Outputs have an impact on organizational efficiency.
- *Everyday efficiency*—Efficiency is present from digitization to digital transformation. First of all, there is an improvement in organizational resources.
- *Organization benefits*—The results of these processes are different. Digitization implies a change in the task level. Digitization impacts operational processes, and digital transformation represents the strategic change in organizations.
- *Transmission*—The transmission of information is carried out at the level of each entity and uses digital data generated by digitization.
- *Tech drivers*—It involves a series of drivers that are approached differently by organizations. Each process involves other drivers.
- *Comprehensive strategy*—Each level of digitization, digitalization and digital transformation involves a certain strategic level. The guidelines must be comprehensive and accepted by the interested parties.
- *Productivity*—Each level of digitization, digitalization and digital transformation implies an improvement in organizational productivity.

Among the digital transformation components used are: software, E-Mail, videoconferencing solutions, websites, databases, application programming interfaces (APIs), hardware (computers, servers, datacenter), robotic process automatic (RPA), internet connections, additive manufacturing (3d printing), augmented reality (AR), mobile phones, advanced human computer-interaction, IoT and many others [6, 30, 32–34].

The Digital Economy and Society Index (DESI) is an index composed of 4 main dimensions human capital, connectivity, integration of digital technology and digital public services that highlight Europe's digital performance. For the year 2022, Romania's situation registers a score of 5.26% for digital public services, 3.79% for digital technology, 13.81% for connectivity, and 7.73% for connectivity [35–37]. The situation at the level of the member states of the European Union is presented in Fig. 1.1.

For the year 2021, Romania's situation registers a score of 4.54% for digital public services, 3.92% for integration of digital technology, 11.46% for connectivity, and 7.52% for connectivity. Romania improved its DESI scores in 2022 compared to 2021.

1.2 Public Versus Private

The digital transition in the public and private sectors presents certain particularities. Table 1.2, presents a series of evaluated factors for organizations in the two categories [1–23].

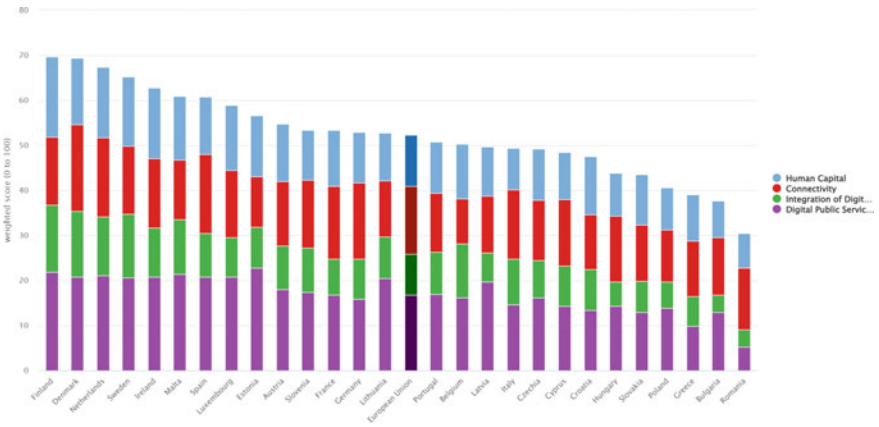

Fig. 1.1 Digital economy and society index for 2022 (European Commission)

Table 1.2 Comparative evaluation of the public and private sectors

Factors	Private sector	Public sector
Universal nature	The number of services, different and customized according to the company's field of activity	High degree of universality because the services are limited and not customized according to the user's characteristics or needs
Wide range of applications	It has a wide range of applications, dynamic and incorporating new technologies	It has a medium range of applications with a medium digitization impact
Digitalization impact	Stakeholders are assessed and involved	General tools are applied to evaluate the degree of citizen satisfaction are applied
Safety	High degree of safety thanks to the new technologies used	Average degree of safety due to the lack of updating of some technologies
Cyber security	High level of security thanks to the new technologies used	Average level of security due to lack of updating of some technologies
Budget	Available for digitization	Limited by local and central government regulations and rules
Success in digitization	Grown as an important component of the business environment	A stage in development, below average, which takes steps to improve the degree of digitization
Generation gap	It is covered by the technologies used and the work teams within the companies	It is felt especially among citizens and the less friendly solutions offered by public institutions
Employee	Qualified and regularly trained	Employees have general skills

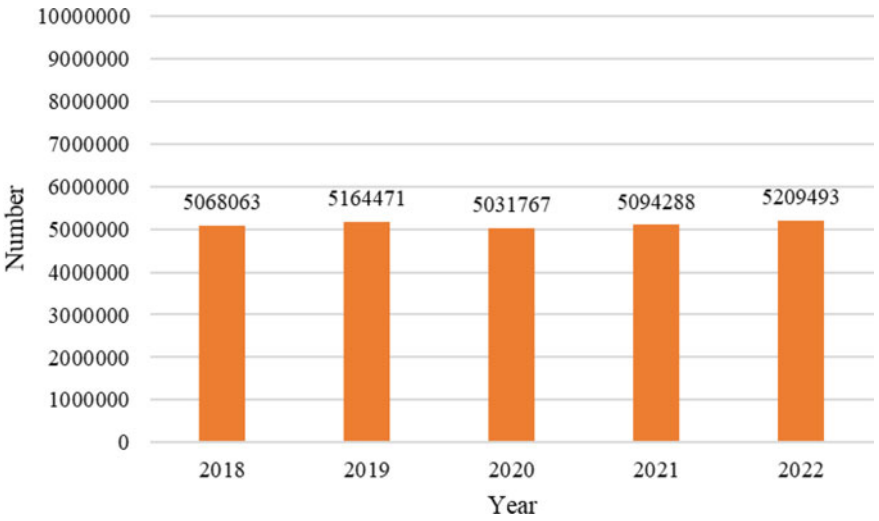

Fig. 1.2 The average number of employees for the period 2018–2022

At the Romanian level, the average number of employees is presented in Fig. 1.2. It can be seen that the situation does not show significant changes. In 1990, the average number of employees was 8,155,605 people.

Depending on the form of ownership, the situation of the employees is presented in Fig. 1.3. It can be seen that for the year 2022, there were the most employees in private ownership, 3,945,275 employees, and in the public sector, 1,264,218. The private sector registers more employees during the entire evaluated period of 2018–2022.

1.3 Digital Transformation in the Public Sector

For this study, the research was carried out by applying an online questionnaire using Google Form. This questionnaire was divided into 3 sections. The results of the research carried out between January and November 2023 are presented below. For this research, 995 valid responses were recorded from personnel working in the private sector. Management functions and execution functions were followed.

The results obtained for the first section are presented below. The age of the respondents is presented in Table 1.3. There were no respondents older than 65 years who work in the public sector. Most of the respondents are in the age category.

Figure 1.4 shows the level of education for respondents from the public sector. Most of the respondents have graduated from college or completed a master's degree. The percentage of respondents with secondary education is 23%.

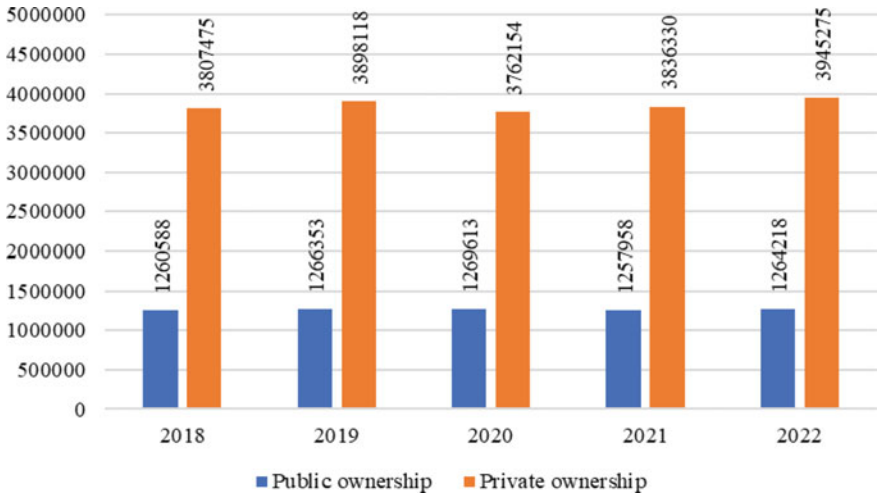

Fig. 1.3 Average number of employees by types of ownership

Table 1.3 What is your age?

Category	Number	Percentage
18–24	34	1.14
25–34	129	4.31
35–44	123	4.11
45–54	534	17.86
55–64	170	5.69
65–74	0	0
75+	0	0

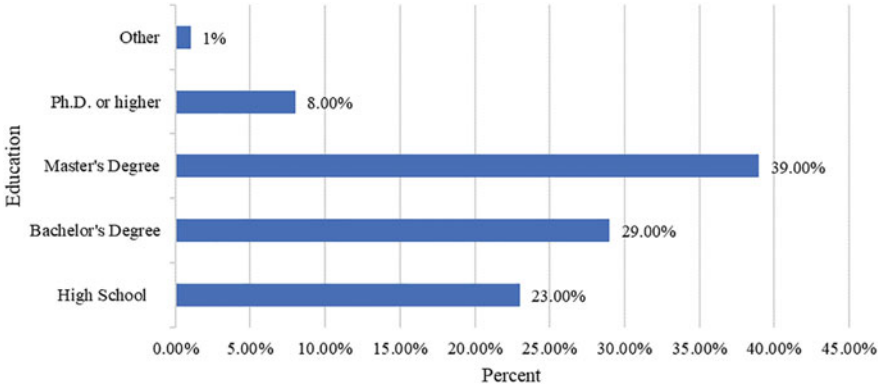

Fig. 1.4 The level of education

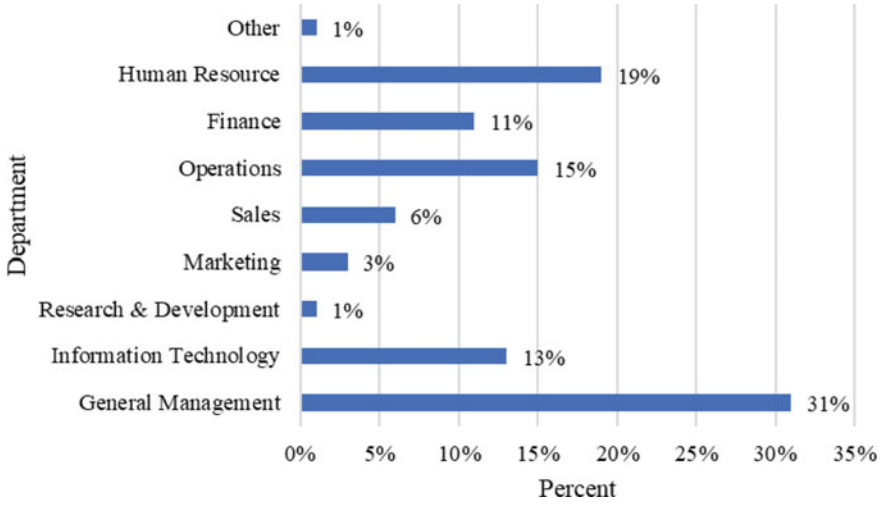

Fig. 1.5 The department of the respondent's activity from public sector

Figure 1.5 presents the public sector respondent activity from public sector. The research and development departments are less present in the activity of the public sector. Many of the respondents work in general management, human resources, and information technology.

The next section of the undertaken research evaluates organizational digital maturity. Different directions are evaluated to outline an image of digitization and digital transformation in the public sector. Several directions are evaluated using the Likert scale**,** Table 1.4. The directions evaluated are the digital maturity of the organization, 100% digital business, the digital business model, the organizational approach for digital transformation, the organizational approach for digitalization, the organizational approach for digitization, digital transformation for management/strategy, operations, products, employee engagement and human resources. From the responses received, the level of digital transformation appreciated by the respondents is below the average level. Public organizations are in the process of reaching 100% digitization. The organization's operations and management are taking steps for digital transformation.

Table 1.5 evaluates the drivers that influence digital transformation in public organizations. It can be seen that the government and the citizens play important roles in this endeavor. Competitors and suppliers do not represent drivers of increased importance.

Table 1.6 highlights the barriers identified in the digitization process. It can be seen that knowledge obtained the highest average score. Other identified barriers are low funds and infrastructure.

The results are presented in Table 1.7. The evaluated factors are strategy and organization, strategy for digital transformation, digital transformation culture, knowledge sharing, agility, and technology. It can be seen that technology is the most

Table 1.4 The public organization's digital maturity

	1 (Very low) (%)	2 (%)	3 (%)	4 (%)	5 (Very high) (%)
The digital maturity of the organization	2.00	67.00	23.00	5.00	3.00
100% digital organization	3.00	84.00	6.00	3.00	4.00
The digital organization model	3.00	56.00	21.00	13.00	7.00
The organizational approach for digital transformation	2.00	64.00	23.00	6.00	5.00
The organizational approach for digitalization	2.00	64.00	23.00	6.00	5.00
The organizational approach for digitization	2.00	64.00	23.00	6.00	5.00
DT for management/ strategy	2.00	74.00	11.00	8.00	5.00
DT for operations	2.00	68.00	16.00	9.00	5.00
DT for products	2.00	68.00	16.00	9.00	5.00
DT for employee engagement and HR	2.00	65.00	21.00	7.00	5.00

Table 1.5 Drivers for digital transformation

	1 (Low important) (%)	2 (%)	3 (%)	4 (%)	5 (Very important) (%)
Competitors	23.00	59.00	13.00	3.00	2.00
Citizen	7.00	6.00	62.00	23.00	2.00
Suppliers	23.00	61.00	11.00	3.00	2.00
Government	1.00	3.00	43.00	49.00	4.00
Others	7.00	67.00	14.00	4.00	8.00

Table 1.6 Barriers for digital transformation

Barriers	Average score
Low funds	4.56
No expert knowledge	4.78
No infrastructure	4.55
Legislation	3.40
No proper management	4.11

Table 1.7 Organizational factors for digital transformation

Factors	Average value
Strategy and organization	4.53
Strategy for digital transformation	3.23
Digital transformation culture	3.98
Knowledge sharing	3.92
Agility	3.01
Technology	4.78

Table 1.8 The result of digital transformation

Direction	Average value
Increase revenue	2.56
Market share	0
Reduce operating costs	2.32
Increase agility	2.34
Improve citizen satisfaction	4.53
Reduce the development time for new products/services	1.23

appreciated factor for DT by the respondents. Strategy and organization, culture and sharing knowledge register important results.

The results and organizational benefits for the digital transformation are numerous and are evaluated by 990 respondents. Among the DT results are increased revenue market share, reduced operating costs, increased agility, improved customer satisfaction, and reduced the development time for new products/services. The most important result is the improvement of citizen satisfaction and then agility. The results are presented in Table 1.8.

1.4 Digital Transformation in the Private Sector

The most used technologies are mobile (75%), Cloud (48%), AI (38%), IOT (42%), digital twin (29%), AR (19%), robotics (18%), and additive manufacturing (3d printing) (13%).

For this study, research was carried out by applying an online questionnaire using Google Form. This questionnaire was divided into 3 sections. The first section is dedicated to the respondent's profile. The second part is dedicated to digital maturity, and the last part was dedicated to organizational strategy. The results of the research carried out between January and November 2023 are presented below. For this research, 2990 valid responses were recorded from personnel working in the private sector. Management functions and execution functions were followed.

Table 1.9 What is your age?

Category	Number	Percentage
18–24	989	33.08
25–34	278	9.3
35–44	956	31.97
45–54	251	8.39
55–64	345	1.54
65–74	115	3.85
75+	56	1.87

The results obtained for the first section are presented below. The age of the respondents is presented in Table 1.9.

From the perspective of the level of education, the situation is presented in Fig. 1.6. It can be observed that the majority of the respondents have master's degrees.

From the perspective of the department where the respondents work, the situation is presented below, Fig. 1.7. It can be seen that there is a distribution of roles in different organizational departments. Many of the respondents are part of general management and information technology.

Depending on the business sector, the distribution of respondents is shown in Fig. 1.8. A distribution of the main sectors in Romania can be observed.

The second section of the research refers to the evaluation of the organization's digital maturity. Several directions are evaluated using the Likert scale, Table 1.10. The directions evaluated are the digital maturity of the organization, 100% digital business, the digital business model, the organizational approach for digital transformation, the organizational approach for digitalization, the organizational approach

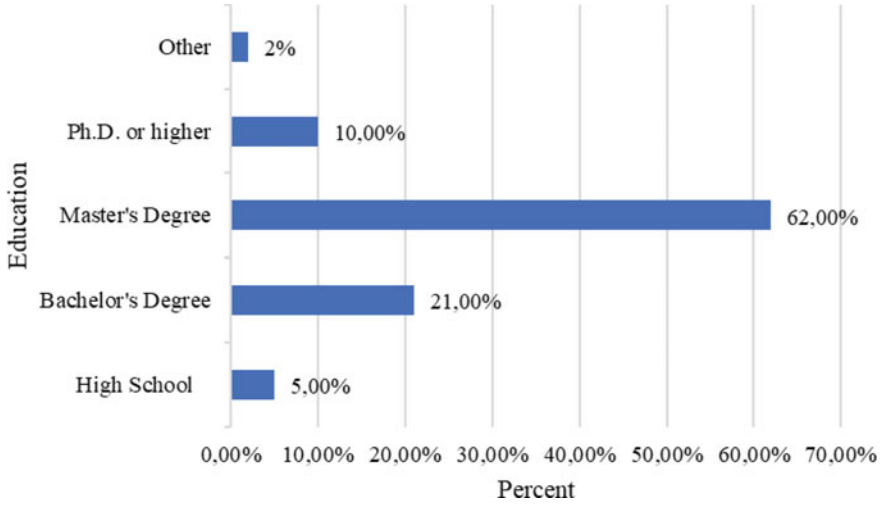

Fig. 1.6 Level of education

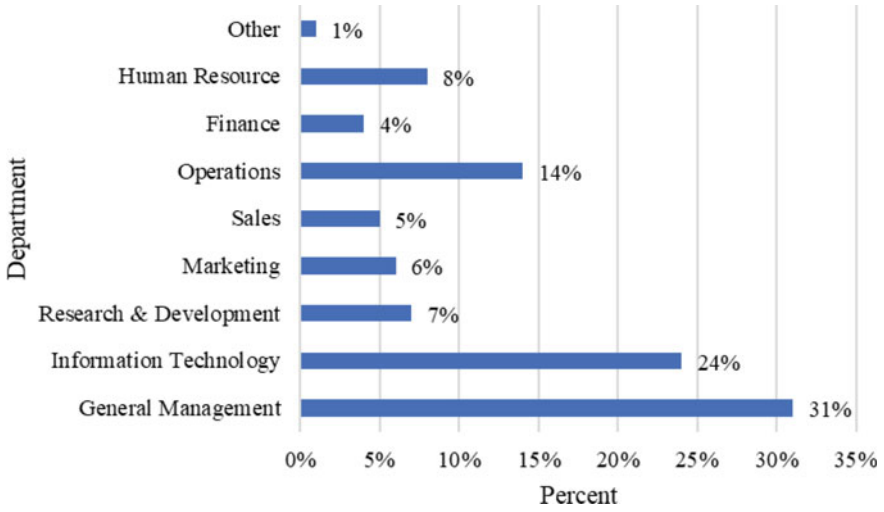

Fig. 1.7 The department of the respondent's activity

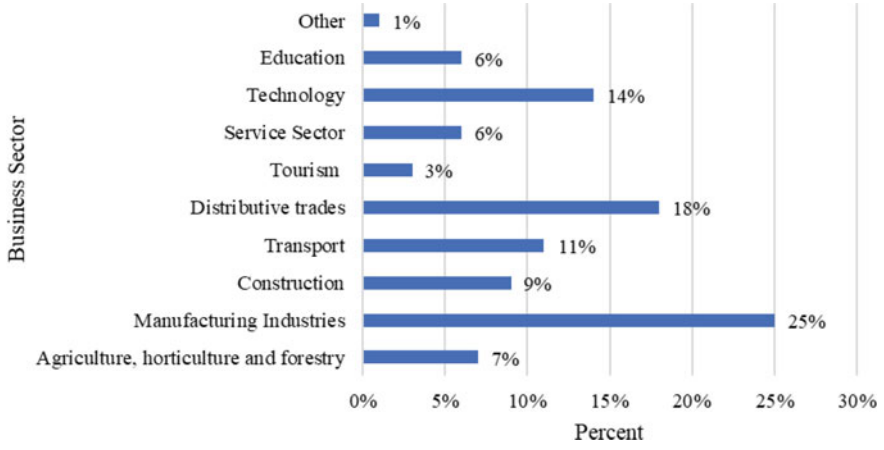

Fig. 1.8 Business sector

for digitization, digital transformation for management/strategy, operations, products, employee engagement and human resources. An average level of digital maturity and total digitization can be observed. Many of the organizations have a complete approach to digitization. Complex activities are carried out for digital transformation for management, operations, and products.

Table 1.11 presents the evaluation of drivers for digital transformation. It can be observed that the most important driver is the customer. The next most important driver, after the average value obtained, are competitors, then suppliers and the government.

Table 1.10 The private organization's digital maturity

Category	1 (Very low) (%)	2 (%)	3 (%)	4 (%)	5 (Very high) (%)
The digital maturity of the organization	2.00	7.30	46.40	35.30	9.00
100 digital business	3.00	13.00	33.00	40.00	11.00
The digital business model	3.00	15.00	37.00	34.00	11.00
The organizational approach for digital transformation	1.00	1.00	2.00	23.00	73.00
The organizational approach for digitalization	0.00	1.00	2.00	16.00	81.00
The organizational approach for digitization	0.00	0.00	0.00	2.00	98.00
DT for management/ strategy	3.50	8.00	14.00	21.00	53.50
DT for operations	3.50	7.00	13.40	27.60	48.50
DT for products	3.50	4.00	10.50	21.00	61.00
DT for employee engagement and HR	3.50	4.00	10.90	73.60	8.00

Table 1.11 Drivers for digital transformation

	1 (Low important) (%)	2 (%)	3 (%)	4 (%)	5 (Very important) (%)
Competitors	0.00	1.00	68.00	21.00	10.00
Customers	2.00	3.00	4.00	78.00	13.00
Suppliers	2.00	8.00	63.00	18.00	9.00
Government	2.00	11.00	69.00	12.00	6.00
Others	7.00	67.00	14.00	4.00	8.00

The third part of the research includes the organizational factors for digital transformation. The organizational factors for DT are evaluated in the present research.

The digital barriers evaluated in this research are low funds, no expert knowledge, no infrastructure, legislation, and no proper management. The most important barrier is the lack of solid knowledge and adapted infrastructure. The results are presented in Table 1.12.

The results are presented in Table 1.13. The evaluated factors are strategy and organization, strategy for digital transformation, digital transformation culture, knowledge sharing, agility, and technology. It can be seen that technology is the most

Table 1.12 Barriers for digital transformation

Barrier	Average value
Low funds	3.13
No expert knowledge	3.52
No infrastructure	3.35
Legislation	2.90
No proper management	3.13

appreciated factor for DT by the respondents. Culture and sharing knowledge register important results.

The results and organizational benefits for the digital transformation are numerous and are evaluated by 2990 respondents. Among the DT results are increased revenue market share, reduced operating costs, increased agility, improved customer satisfaction, and reduced the development time for new products/services. The most important result is the improvement of consumer satisfaction and then agility. The results are presented in Table 1.14.

Table 1.13 Organizational factors for digital transformation

Factors	Average value
Strategy and organization	3.99
Strategy for digital transformation	3.78
Digital transformation culture	3.98
Knowledge sharing	3.92
Agility	3.75
Technology	4.20

Table 1.14 The result of digital transformation

Direction	Average value
Increase revenue	3.87
Market share	3.76
Reduce operating costs	3.55
Increase agility	4.57
Improve customer satisfaction	4.78
Reduce the development time for new products/services	3.54

Table 1.15 Barriers for digital transformation for public and private organizations

Barriers	Implication
Cultural	In many fields, cultural factors represent an important barrier. Organizational culture plays an important role in this direction
Structural	The structural elements are important at the organizational level
Process	The complexity of the processes and their management can represent barriers
People	People and mainly employees are often reluctant to the digitization process
Information system	Information systems can often present certain peculiarities that make them complex

1.5 Barriers and Drivers for Digital Transformation

This chapter is based on specialized literature [5–16] and research undertaken for public and private organizations. Barriers and drivers for digital transformation are presented. The barriers for this approach are presented in Table 1.15. They are considered the most relevant directions with regard to the research undertaken. The barriers refer to directions cultural, structural, process, people, and information system.

Table 1.16 shows the drivers that contribute to DT. These drivers were selected based on specialized literature [6–19] and developed research. Thus, a list of the most relevant drivers was obtained.

Drivers and barriers must be evaluated by each organization and solutions identified for a correct and complete approach to DT. This subchapter represents a basis for public and private organizations.

1.6 Conclusions

Digitization, digitalization and digital transformation are important processes for public and private organizations. That is why the present research proposed to carry out a market research in order to outline a real picture of the involvement in these processes of the organizations in Romania. The results show that the two sectors, public and private, register different results from the perspective of barriers or drivers that contribute to DT. The level of digitalization maturity differs between the two sectors. The involvement of employees and the approach to digitization have particularities. These technological developments were anticipated in previous researches and represent a necessity of the current dynamism [38].

The limitations of the research refer to the fact that the research was carried out at the level of Romania. Future research will also target other member countries of the European Union and finally outline some profiles of the 2 sectors.