BUSINESS DIGITIZATION IN THE ROMANIAN ECONOMY

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Abstract. *Lately, digitization has become a popular term characterized by opportunities and challenges that are more and more present in business activities, in developed and developing nations and consequently, also in the Romanian economy. The aim of this research paper is to gain insight in the field of digitization and the digital economy, with a particular interest in business digitization. In the first part of the paper, we analyzed the "Digital Economy and Society Index 2017 for Romania", which measures the progress of the EU states in terms of the evolution of the digital economy and society. The second part of the article is made up of a quantitative research, focusing on the business digitization in the Romanian economy and trying to answer several research questions: (1) Is business digitization relevant for Master's students? (2) Are Master's students interested in business digitization? (3) Do respondents have digital skills? (4) Are digital investments welcome in Romanian businesses or not? Through a questionnaire addressed to Master's students, the current study aims to reveal the respondents' perception on the impact of digital economy on Romanian businesses. This research identifies at the same time challenges and specific practices that certain firms use. The findings underline the increased awareness of respondents in business digitization, their high digital literacy as well the low digital investments that companies are ready to make. Another important aspect revealed by the research is that respondents perceived digital technologies as processes which add value in enterprises (95% of them) and they are unaware of the career opportunities within this field. What is important to be observed here is that women totally rejected this question, by answering particularly with strongly disagree and disagree (67% out 74.1%). Apparently, barriers still exist, especially for women less represented in computer courses of higher education, and within the entire industry.*

Keywords: *digitization; digital economy; digital skills; business; impact.*

Introduction

In recent years, digitization modified and challenged the whole society, (Newell & Marabelli, 2015), creating new working skills, modern cultural conditions and innovative communication and entrepreneurial tools (Galliers et al., 2015). In a fast changing knowledge-economy where knowledge becomes a strategic resource (Bolisani & Bratianu, 2017), digitization connects not only the intellectual capital (Bejinaru & Iordache, 2011; Bratianu, 2011; Bratianu & Orzea, 2013a, b) of organizations but also of corporations, services and states smoothing business processes, partnerships, interaction, ultimately, leading to complex networks (Pînzaru,

2015). This results in the emergence of a new economy, where individuals become "walking data generators" (McAfee & Brynjolfsson, 2012, p.5) not only socially speaking but also from an organizational stand point. The new economy is based on intangibles which are nonlinear (Bratianu, 2009, 2010) and thinking models which go beyond linear thinking (Bratianu, 2007).

The hereby research highlights mainly the role of digitization and digital economy on businesses, but also its impact on the business environment in Romania, especially if we take into account the societal changes. Pros and cons can easily be found in the academic literature on this theme, particularly in recent studies, some shedding light on the advantages and some on the disadvantages of digitization (Galliers et al., 2015; Markus, 2015). Scholars, practitioners, and literature in the field "describe and analyze complex and sometimes controversial issues concerning the consequences of enterprise digitization on individuals and work" (Koch et al., 2012). Loebbecke and Picot refer to these benefits which emerge "from the jettisoning of routine work, the growing availability of flexible work hours, and better work-social life balance, to the challenges of being always online (and risking 'burnout') and a 'freelance economy' where individuals have to struggle for paid work" (2015, 150). All in all, business digitization represents actually, innovative business models (Loebbecke & Picot, 2015, p.150) involving digital data (Tapscott, 2015). The global business community is moving towards accelerating digitization.

The current state of knowledge regarding business digitization and digital economy

The hereby research is centered on two major concepts: business digitization and digital economy. In order to gain a broader understanding, both of them will be carefully analyzed and explained. The present research is aligned to the pillars of knowledge management.

The concept of digitization emerged once Gottfried Wilhelm Leibniz's Explication de l'Arithmétique Binaire was published, in 1703. If at first, this meant two symbols, later on, the concept was developed and highly accelerated (Bounfour, 2016), moving from personal computers to the 'World Wide Web' (Vogelsang, 2010), this last discovery changing completely the speed of the evolution of digitization (Collin, 2015). From that moment on, the process of digitization, alongside with all its following effects, referred to, in the academic literature as "digital transformation" (Berman, 2012; Chew, 2015), increased contemporary business scholars' interest on the matter, business digitization being debated in conferences and in business reviews by academics, policymakers, private and public organizations. Currently, digitization represents a "global megatrend that is fundamentally changing existing value chains across industries" (Collin et al., 2015, p.29) influencing businesses, employees, customers, beneficiaries, and stakeholders. From the point of view of the socioeconomic impact of the concept, the following framework can be drawn:

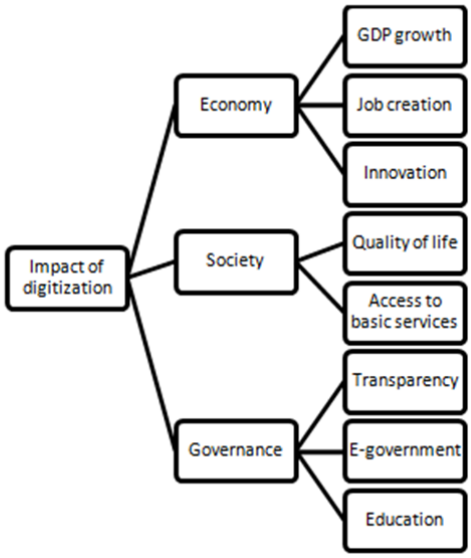

Figure 1. Digitization's socioeconomic impact (World Bank; World Economic Forum)

As the EU admitted in the working paper *Expert Group on Taxation of the Digital Economy,* "defining what constitutes the digital economy has proven problematic, because of the ever-changing technologies of the ICT sector and because of the widespread diffusion of the digital economy within the whole economy, it can no longer be described as a separate part, or subset, of the mainstream economy" (European Commission, 2014, p.3). If scholars did not succeed in agreeing on a standard definition for digitization, they did, however, admit that it represents a major provocation for organizations and particularly for managers (Westerman et al., 2014), bringing dramatic improvements for the economy, society, and governance.

If we refer to digitization in terms of the last two decades innovation waves, several new technologies can be mentioned: "the internet, e-commerce, mobile broadband, social media and Big" (McKinsey Global Institute, 2016, p.3). All the above mentioned innovations transformed technologies, infrastructure, and most importantly, business practices.

Digitization and digital economy are however interrelated, the central role in both of the concepts being played by ICT (Blum, 2015, p.314). Bearing in mind the above study on digitization, the attention will further shift to the definition of digital economy, as accepted and recommended by OECD: "The digital economy is the result of a transformative process brought by information and communication technology (ICT). The ICT revolution has made technologies cheaper, more powerful, and widely standardized, improving business processes and bolstering innovation across all sectors of the economy" (OECD, 2015, p.11). In fact, as Gaoua (2014) states, the digital economy stands as a business model relying mainly on ICT. In this vein, traditional business models transform themselves with the help of data and networks into innovative business models, undergoing an organizational reshaping process (Rogers, 2016).

The digital development currently dominates all the economic areas. According to Accenture, if in 2005, the global digital economy totaled 15%, in 2015 it reached 22%, being forecasted to grow up to 25% by 2020 (2016).

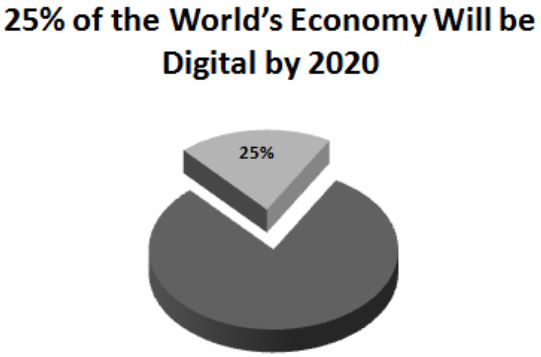

Figure 2. Forecasts for 2020 in the case of digital economy (Accenture, 2016, p.4)

From the organizational point of view, Westerman et al. (2014) state that businesses, in order to become "digital masters" should (1) correctly operate and implement digitization and (2) rely on leadership skills. At the same time, another important aspect underlined by researchers in the field was the necessity for corporations to "embrace digital, […] empower their people – consumers, employees and ecosystem partners – to continuously learn new skills to do more with technology and thus generate bigger and better business results. That demands a digital corporate culture enabling people to create fresh ideas, develop cutting-edge products and services and disrupt the status quo. In an age where technology is in the spotlight, the success mantra for digital businesses: Place People First" (Accenture, 2016, p.4). Indeed, scholars agree that intellectual capital is paramount for gaining "a competitive advantage and for the capacity of an organization to create value" (Bratianu, 2009, p.63).

Digital economy can be analyzed only in the larger context of the Digital Agenda for Europe, part of the Europe 2020 Strategy, one of the seven initiatives of the UE addressing particularly digitization, whose provisions are applied to Romania under the name of Digital Agenda for Romania 2020 (Rada, 2015, p.36). The National Strategy on the Digital Agenda for Romania implies the following areas of action as mentioned in Figure 2:

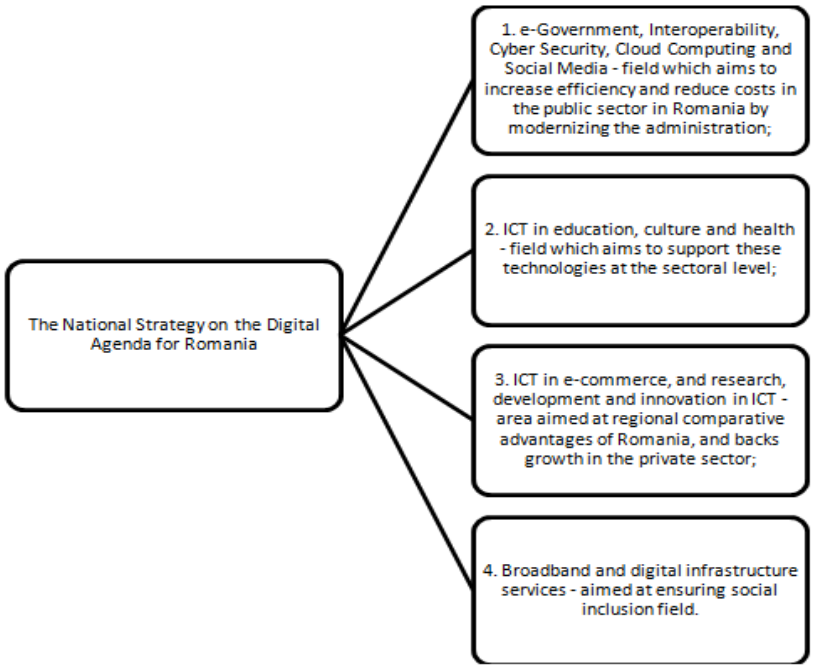

Figure 3. Areas of action for the National Strategy on the Digital Agenda for Romania (Stratulat & Ciobanu, 2016, p.349)

In this vein, several problems of development of the digital economy in Romania emerge, the most important of all being that there is no national strategy for the digitization of businesses.

According to the "Digital Economy and Society Index 2017 – Romania", which measures the progress of the EU states in terms of the evolution of the digital economy and society, there are five major items regrouping more than 31 indicators which are to be found in the table below:

Table 1. DESI Indicators (https://ec.europa.eu/digital-single-market/en/desi)

Dimensions	Indicators
1 Connectivity	Fixed broadband, mobile broadband, broadband speed and prices
2 Human capital	Basic skills and internet use, advanced skills and development
3 Use of internet	Citizens' use of content, communication and online transactions
4 Integration of digital technology	Business digitisation and e-commerce
5 Digital public services	eGovernment

As it can be seen, if we compare Romania with the rest of EU Member States, our country ranks 28th, the last rank according to the DESI indicators. Thus, out of five indicators, Romania occupies the last rank for four of them. This means that the only indicator with better performances for our country is Connectivity, where Romania reaches 12.5%, which places Romania on the 9th position. For all the rest of dimensions, Romania is listed last. In spite of the progress made during the last years, the gap between the other EU States is still considerable, and up to a certain point, we can also mention the digital divide, which keeps Romania away from digital progress.

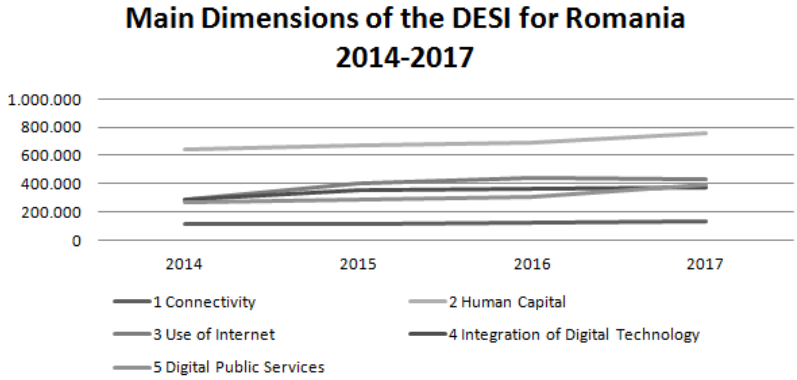

Figure 4. Main Dimension of the DESI for Romania 2014-2017 (Europe's Digital Progress Report, EDPR, 2017). Country Profile Romania (https://ec.europa.eu/digital-single-market/en/desi)

Further on, a general analysis on the five main dimension of DESI for Romania will be conducted.

Thus, in terms of the Connectivity indicator, Romania gains particularly from urban areas, where are mostly fast broadband connections, translating into the maximum subscriptions share from the European Union to the detriment of rural areas. Along with this, there is also high interest in mobile broadband, this development being both stimulated and accelerated. In spite of all these, the digitization of our economy is still low and in line with the EU average which is also notably lower. For this dimension, it should also be mentioned that 4G broadband network of our country is the lowest in the whole EU.

The second indicator, Human Capital, which focuses mainly on individuals' digital skills and handling of the internet, remains for our country the second lowest of the 28th Member States. More people are online, and digital skills levels are improving but remain the second lowest in the EU. Digital literacy in Romania is, therefore, one of the weakest in the EU, which is worryingly and could convert into a skills crisis (House of Commons Science and Technology Committee, 2016). As Andreica et al. (2016, p.343) argue, it is important for our state "to address severe e-skills gap in order to fully develop the digital economy and digital society, develop digital skills of citizens", especially since "a little more than half of Romanians are regular internet users (56%) compared with 79% in the EU. 28% of Romanians possess above basic levels of digital skills" (the EU level is 56%). (Europe's Digital Progress Report (EDPR), Country Profile Romania, 2017, p.5) The incredibly low percent of 28% of Romanians, possessing basic

digital skills may turn into an important economic barrier for the development of our state.

As far as the Use of Internet is concerned, Romanian online users accede to a wide typology of activities on the Internet. However, there is a general reluctance to online transactions, no matter if we refer to banking or e-commerce. Indeed, we should consider that "it is widely accepted that e-commerce improves efficiency through four essential factors: cost reductions, more competition, a better organization of production processes, and greater access to different varieties of products." (United Nations Economic Commission for Europe, 2011, p.251).

Another important dimension of the DESI is Integration of Digital Technology, of major importance for the hereby research. This indicator focuses particularly on businesses, which unfortunately failed even in 2017 to digitize their work. Thus, if in 2016 only 6% of the firms were using social media, this year there is a small raise of 2%, which, however, places our country, again, on the last rank for this dimension. This small increase comes in contrast with the high percentage of social media users. Also, the report mentions that: "no progress has been registered in terms of SMEs selling online (7%) and a decrease can be seen for use of cloud services (-5%) and eCommerce turnover for SMEs (-4.3%)", (Europe's Digital Progress Report (EDPR), Country Profile Romania, 2017, p.7), which is even more worrying, since these parts of the digital economy can provide competitive advantage for each sector and industry, since they can improve the productivity, performance, and profitability of each business.

The widespread "Integration of Digital Technology" stands as a major opportunity for businesses and the economy as a whole. Several investigations which examined the relationship between digitization and improved productivity agreed on the idea that high IT&C investments are important factors for "doubling the productivity growth rates" (Miller & Atkinson, 2014). At the same time, Miller and Atkinson (2014) confirmed that research undertaken on multinational firms in the United States conducted to the result that these corporations were "with 8.5% more productive on average than UK domestic owned firms", the main explanation being the impact of ICT on the respective businesses. However, in spite of the existence of the Romanian National Digital Agenda Strategy, its focus seems to be more on the social measures than on the business area, especially since elements such as cloud computing, open data and e-commerce are hardly addressed. Indeed, as Europe's Digital Progress Report (EDPR) for Romania states, "there seems to be a lot of room for adopting policy measures that support the uptake of digital technologies in the day to day life of companies. Companies in Romania do not seem to see digital technology as a tool to boost productivity and create growth. ICT technology and cloud services are seen as a significant additional investment, rather than a pre-requisite for a successful business" (2017, p.7).

The last dimension of the DESI is "Digital Public Services", where, again, Romania's performance is weak, below EU's rate, with some improvements at the online public services for firms and citizens.

Research, methodology, objectives, and limits

This study was designed to investigate the perception and awareness on business digitization in Romania. The research method used was the quantitative one, being also used exploratory and descriptive statistics. The data was collected with the help of an online survey structured in two parts: the first one providing data on the participants (gender, age, employment type), and the second part, focusing on business digitization, more precisely on: degree of familiarity with the subject of digitization; digital skills; digital investments. The questionnaire was completed by master's students, being accepted only those questionnaires completed by students working in private firms. A total of 394 questionnaires completed by master's students of The Bucharest University of Economic Studies were considered as fulfilling the initial request (private job).

The objectives of the research referred to:
-Determine the relevance of business digitization for Master's students;
-Identifying how interested are Master's students in business digitization;
-Measuring the level of digital skills;
-Determine the most degree to which digital investments are welcome or not.

As for the limits of the research, the studied population is limited to Master's students working in private companies and coming from the Bucharest University of economic Studies, and the results can be biased since 74.1% of respondents are women.

The sample Master's students can be found in the table below.

Table 2. Respondents' features (total = 394)

		Frequency	Percent %
Gender	Male	102	25.9
	Female	292	74.1
Age	22-23	205	53.0
	24-25	183	46.5
	26 and older	6	1.5
Employment status	Working full time	74	18.8
	Working part time	320	71.2

When respondents had to answer whether they are familiar with the terms digital economy and digitization, more than half (54.0%) stated that they strongly agree, meanwhile 37.0% said that they agree. Only 8% did not provide an answer stating that they neither/nor agree, and 1% disagreed to the statement. The lack of knowledge regarding these key concepts was reflected later on in a lack of digital skills, as we shall see further on.

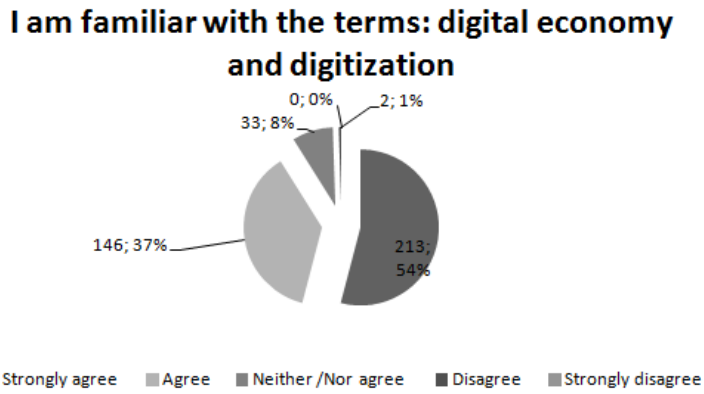

Figure 5. Distribution for I am familiar with the terms digital economy and digitization

In our research, the respondents consider digital technologies as processes which add value in enterprises (95% of them).

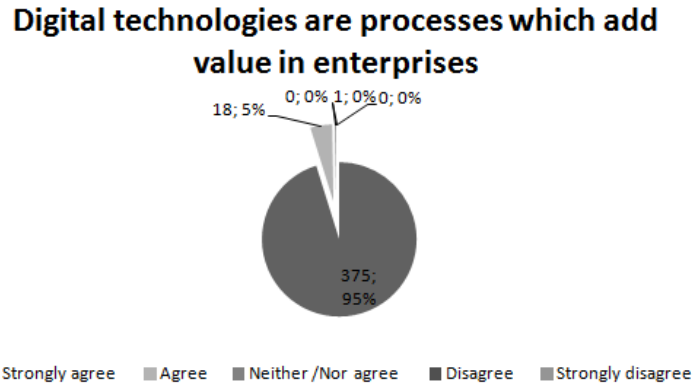

Figure 6. Distribution for Digital technologies and processes which add value in enterprises

When asked whether they think that they have basic digital skills, on the one hand, 72% answered that they strongly agree, and 19% that they agree; on the other hand, the rest of 9% stated that they disagree. This means that, even if young individuals living in urban areas tend to have digital skills, there are also some who are not familiar with the digital world. This translates into a major risk to business growth and societal development because lately, more and more knowledge-intensive sectors are developing, becoming highly digitized.

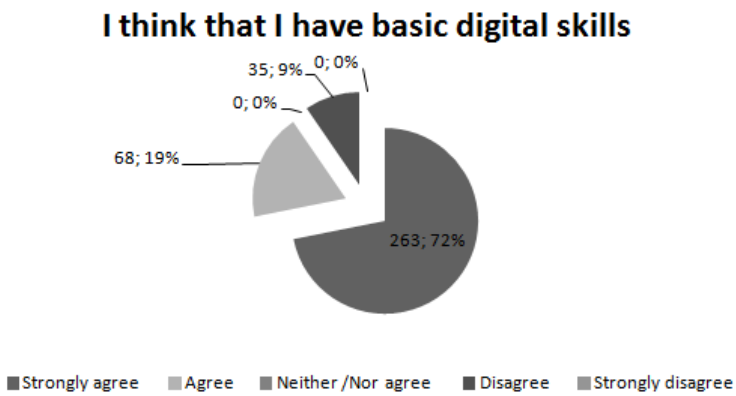

Figure 7. Distribution for I have basic digital skills

Another question of the research focused on the possibility of respondents to consider an IT job offer. Their answers proved a lack of awareness of career opportunities within this field. Either they are not informed on this matter, or they do not have the necessary studies or skills. An important aspect observed here is that women totally rejected this question, by answering particularly with strongly disagree and disagree (67% of 74.1%). Apparently, barriers still exist, especially for women less represented in computer courses of higher education, and within the entire industry.

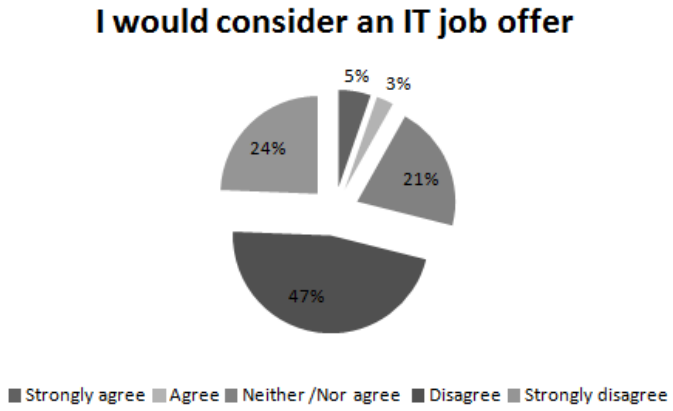

Figure 8. Distribution for I would consider an IT job offer

The last question of the research dealt with the willingness of enterprises to invest in digital technologies. For this answer as well, most answers were negative. Respondents consider that their managers have no desire or have a little wish for digital investments. Proper business digitization implies considerable investment in time and effort. In order to increase competitiveness, flexibility, in order to better adapt to clients' needs and therefore implement new business models, companies must invest: in employees, processes, technology and so on.

Conclusions and implications

The present study aimed to make an innovative contribution to the existing literature on the business digitization in the Romanian economy. The outcomes of the hereby analysis state that our economy, society, and government do cope with upcoming changes and challenges regarding the digitization processes, making permanent and constant progress. The quantitative research also proved that respondents are familiar with the subject of digitization, considering digital technologies as processes which add value in enterprises (95.2% of them). At the same time, they do have good and very good digital skills, meaning that they own digital literacy. On the other hand, when asked about digital investments and whether their managers are taking into consideration this type of investments, the answers were negative. Another question on which the research focused was the possibility of respondents to consider an IT job offer. Their answers proved a lack of awareness of career opportunities within this field. An important aspect observed here is that women totally rejected this question, by answering particularly with strongly disagree and disagree (67% of 74.1%). Apparently, barriers still exist, especially for women less represented in computer courses of higher education, and within the entire industry.

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