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DIGITAL ENTREPRENEURSHIP: THEORETICAL AND PRACTICAL ASPECTS

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Abstract

The rapid development of Information and Communication Technologies (ICTs) in the late 20th and early 21st centuries has caused a digital transformation in all spheres of socio-economic life. Digitalization has brought about radical changes in the economy and the way we do business, creating new business models. Expanding the scope of digitalized business activities, the widespread penetration of e-commerce in the marketing tools of companies and the development of digital entrepreneurship are one of the successful formulas for overcoming the crisis caused by the COVID-19 pandemic and rebuilding national economies.

The article aims to reveal some theoretical aspects of digital entrepreneurship and to analyze the process of digitalization of entrepreneurial activity in Bulgaria. To achieve this goal, some theoretical formulations for digital entrepreneurship in the context of the digital transformation of society and the digital economy, respectively, are considered. In practical terms, based on statistical data from various sources, an analysis of the digitalization of entrepreneurship in Bulgaria.

Keywords: *Digital transformation; digital economy; digital entrepreneurship; innovation*

JEL Codes: *L81, L26, O33*

Introduction

The last three decades have been marked by the entry of the world economy into the Fourth Industrial Revolution, influenced by the rapid development of information and communication technologies (ICT), the much stronger and more widespread use of the Internet, artificial intelligence (AI) and machine learning. Socio-economic life has been significantly affected by these innovative changes, which "radically change the way we live, work and we relate to each other" (Schwab, 2016, pp. 13-16).

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According to Schwab (2016, p.13), the new technological revolution is of paramount importance, consisting of the "unlimited possibilities created by the billions of people connected to mobile devices, thus giving birth to unprecedented processing power, storage capacity and access to knowledge". All this leads to "tectonic shifts in all sectors of the economy, marked by the emergence of new business models, the subversive impact on traditional industries and the restructuring of production, consumption, transport and supply systems" (Schwab, 2016, p.14)

Innovative transformations based on the latest digital technologies have a significant impact, especially on the most active part of economic entities - entrepreneurs, who see them as a new opportunity for further business development. In this regard, Kollmann et al. (2022, p. 21) emphasize that “development has, in turn, led to an evolution of the entrepreneurship phenomenon as a whole”. A significant impetus for the introduction of new technological innovations in the daily use of the population and business was the crisis resulting from the pandemic caused by COVID-19. It required compliance with special anti-epidemic measures, in many cases working from home, limiting the activities of some sectors of the economy and even lockdown in a number of countries.

The change management and the improvement of the organizations’ crisis sustainability provide opportunities for long-term development. Kuzmanova and Atanassov (2021, p. 63-64) emphasize that over the recent years “the crisis-related processes have led to” an increasingly “topical issue about the efficiency of decisions organizations make in the field of” the crisis management.

The changes that have taken place as a result of COVID-19 Pandemic and the need to overcome the followed-up crisis have raised the question of better business management. The companies have to preserve businesses and jobs, ensure greater sustainability of the economy and society, create new strategic opportunities for future development after the exit from the crisis and maintain the competitive advantages. In this context, one of the successful formulas was even faster and, in some cases, forced, due to the lack of another solution, the introduction of digitalization in all spheres of life. Businesses expanded the scope of digitalized business activities and those in the public sector made significantly more deep penetration of e-commerce in the marketing tools of companies and increased the development of digital entrepreneurship worldwide. In many cases, the digital transformation in pandemic conditions has proved to be almost the only way for many businesses to survive.

Examining the impact of the COVID-19 Pandemic on accelerating digital transformation in organizations, Soto-Acosta (2020) emphasizes that „especially during the lockdown, digital technologies have made our lives easier and, at the same time, permitted businesses to maintain a certain level of activity“. Under conditions of coronavirus,

scientists observed a “60% increase of the Internet traffic from December 2019 to May 2020” and the video conference traffic also accelerated by “around 120% compared to levels before the outbreak” (Soto-Acosta, 2020, p. 260). These findings are confirmed by the European Center for Digital Competitiveness, which in its Digital Riser Report 2020 states that in the conditions of COVID-19 pandemic the digital businesses have survived and even achieved sustainable growth.

The same report emphasizes that the condition for successful digital transformation is linked to the optimal development of two dimensions: the mindset and the ecosystem of each country. According to the European Center for Digital Competitiveness, "the way governments manage and navigate this transition will significantly determine how competitive and prosperous their countries will be in the coming decades" (Digital Riser Report 2020, p. 4).

The crucial importance of digitalization for the maintenance of economic and social life during the pandemic, and subsequently for a successful transition to a sustainable economy and society, is emphasized in the report presenting the DESI (Digital Economy and Society Index) data. It measures the degree of digital competitiveness in the European Union (EU). The European Commission recognizes the importance of "reforms and investments in digital technologies, infrastructure and processes" because they will have a positive impact on the EU's sustainability and competitiveness worldwide. (Digital Economy and Society Index (DESI) 2021. p. 11)

Given all this, the purpose of this article is to reveal some theoretical aspects of digital entrepreneurship and from a practical point of view to analyze the process of digitalization of entrepreneurship in Bulgaria.

Digital economy and digital entrepreneurship

The problem of digital entrepreneurship is significantly less studied than that of traditional entrepreneurship. A more important place in the scientific literature is the general problem - the digitalization of the economy in all its aspects. In this regard, analyzing the number of publications on digital entrepreneurship, Kraus et al. (2019, p. 356) state: “Research on digital entrepreneurship still seems to be in its infancy” and are still too few. In our opinion, given that the digitalization of the economy is a relatively new phenomenon, the statement of Kraus et al. is straight.

In the scientific literature, digital entrepreneurship is considered in the context of the digital transformation of society and the digital economy, respectively (Boyko et al., 2017; Lobanova, 2019; Richter, Pahomova, 2018; Ustinova, 2019; Dashkov, Repushevskaya, 2019; Dudin, Omarova, 2019; Zaytseva, 2021; Antonizzi, Smuts, 2020, etc.). Lobanova (2019, p. 52) points out that “the digital economy and the digital entrepreneurship are two

intertwined phenomena of modern life conditioned by economic and technological progress, by internal and external factors". According to Dudin and Omarova (2019), the digital transformation of the economy "opens up new opportunities for entrepreneurship". The opinion of Nobanee and Dilshad (2020, p. 4808) is similar, emphasizing: "Digital technologies have contributed to reshaping traditional business structures, processes, and strategies to operate in globally competitive environments. It has also fundamentally reshaped labor markets in major developed economies". The digital transformation of the economy "leads to a restructuring of business processes, transformation of business models, systems for marketing management and change in consumer behaviour" (Dudin and Omarova, 2019).

Special attention is paid to the definitions of digital entrepreneurship. Digital entrepreneurship, based on the increasing penetration of digital technologies in economic life, should be understood as "a subcategory of entrepreneurship in which some or all of what would be physical in a traditional organization has been digitized" (Hull et al., 2007, p. 293).

At the same time, in the scientific literature, it is seen as an innovation created by the development of digital technologies. Based on the foundation defining digital entrepreneurship, we also believe that it is a phenomenon that can be seen as an innovation, entering all the company's activities, adjusts their management and implementation in accordance with the digital transformation of the economy. At the same time, the expansion of its scope contributes to an even deeper penetration of digitalization in the field of economy and business and their digital transformation.

Soltanifar and Smailhodžić (2021, pp. 6-9) launched the idea that the focus of digital entrepreneurship is on the use of high technology in order to establish and implement entrepreneurial opportunities. The digital entrepreneur is faster at discovering, evaluating and exploitation of innovations. Although, he recognizes the need for a deep consideration and business planning and also improving the company's ability to meet customer needs. Soltanifar and Smailhodžić (2021, pp. 6-9) pay very close attention to the digital entrepreneurial mindset (DEM) because they assume this is the ability to adapt faster to the opportunities of digital technologies. The authors connect digital entrepreneurship with the mental attitude for its implementation because the DEM can be defined as a way of thinking about what kind of activities and investments to conduct in order to receive returns. The digital technologies' integration into everyday life enables entrepreneurs to foresee and exploit opportunities accordingly (Soltanifar, Smailhodžić, 2021, pp. 6-9). The authors underline that new business models' configurations add much more customers' value.

Boyko et al. (2017, p. 1128) define enterprises in this field as enterprises with new digital business models. The opinion of other scientists is no different. For example, Dudin

and Omarova, as well as Lobanova, define digital entrepreneurship as entrepreneurship that uses new digital technologies (especially social networks, large volumes of data, mobile solutions or "clouds"), emphasizing that the main goal can be to improve business operations, invent new business models, improve the intellectual resources of the enterprise or communicate with consumers and stakeholders. (Dudin, Omarova, 2019; Lobanova, 2019, pp. 53-54).

The view of Kraus et al. is that "in general, any entrepreneurial activity that transfers an asset, service or major part of the business into digital can be characterized as digital entrepreneurship." In their opinion, "digitalization is not reduced to single new developments in entrepreneurship. Rather, business models face a huge shift towards entire digital environments. In addition to new businesses created out of arising opportunities due to digitalization, existing branches and businesses alter from offline to online business - establishing “digital entrepreneurship” as a novel form of entrepreneurial activities (Kraus et al., 2019, p. 354). The authors link digital entrepreneurship with the sharing economy, which "not only provides digital entrepreneurs with a business model", but its special forms made entrepreneurship possible in the first place.

According to Satalkina and Steiner (2020), digital entrepreneurship is “an essential driver within the innovation system”. This meta-structure provides the entrepreneurial activities’ conditions. “It changes the structure, aims, and networking mechanisms of the overall business system and, ultimately, affects the various levels and dimensions of the innovation system” (Satalkina and Steiner, 2020).

According to Giones and Brem (2017, p. 47), digital entrepreneurship involves entrepreneurial pursuits which occur on a digital platform, the concept of digital technology entrepreneurship necessarily combines elements of technology and digital entrepreneurship. They include in the definition of technology entrepreneurship specific aspects related to this specific form of entrepreneurship: digital technology entrepreneurship is focused on the identification and exploitation of opportunities based on scientific or technological knowledge through the creation of digital artefacts. Digital technology entrepreneurs build firms based on technologies on the one hand, and on services on the other hand. The authors view digital entrepreneurship as a new type of technology entrepreneurship: digital technology entrepreneurship (Giones, Brem, 2017, p. 47).

Opportunity-oriented is also the definition of Davidson and Vaast (2010), who state the following: "We refer to digital entrepreneurship as the pursuit of opportunities based on the use of digital media and other information and communication technologies" and add that "entrepreneurship in the digital economy" entails three distinct, yet interrelated, forms of opportunity discovery and exploitation: business, knowledge, and institutional

entrepreneurship". The same authors draw attention to the numerous and diverse new ventures that provide opportunities for digital entrepreneurship and at the same time are its essential aspects: Internet, World Wide Web, mobile technologies, and new media, such as: dot-com companies, the so-called eBay entrepreneurs who use the digital infrastructure of the electronic auction company, social networks and mobile technologies, weblogs (Davidson and Vaast, 2010).

Given the cited views of various authors on the digitalization of the economy and the implementation of digital technologies in business, we can conclude that today digital entrepreneurship is not only online commerce by using the Internet, social networks, developed electronic systems for relationships between entrepreneurs and consumers of goods and services. It is obvious that it is much more - overall digital business management.

It is gradually, aggressively, and in recent years extremely rapidly moving in its development from the stage of Internet entrepreneurship to the stage of intensive penetration into the breadth and depth of new even more advanced digital technologies, which digitalize all aspects of economy, business and public life. Today, along with traditional entrepreneurial businesses, there are those whose activities are carried out only in the digital environment. In this regard, it should be noted the opinion of Boyko et al., According to which enterprises in the digital economy depending on the degree of digitalization can be differentiated into three categories: 1) traditional enterprises that have physical assets and create physical output, but actively use modern technologies based on the created infrastructure, equipment, communication systems and software products; 2) enterprises selling physical products (goods) exclusively through virtual channels (online sales), and physical assets are mainly storage facilities; 3) fully virtual enterprises that work in an online environment and create virtual products (eg search engines such as Google and their analogues, e-mail, social networks, electronic services (such as Booking.com, etc.), mobile applications, etc.) Boyko et al., 2017, pp. 1131-1132).

It is also worth noting the differentiation of digital entrepreneurship that Hull et al. (2007, p. 9) define three types of digital entrepreneurship as follows: "The first, mild digital entrepreneurship, involves venting into the digital economy as a supplement to more traditional venues. The second, moderate digital entrepreneurship, requires a significant focus on digital products, digital delivery, or other digital components of the business. Moderate digital entrepreneurship could not exist without the digital infrastructure. The third, extreme digital entrepreneurship, means the entire venture is digital, including production, the goods or services themselves, advertising, distribution, and the customers" (Hull et al., 2007, p. 9).

Regarding the cited distinction made by Hull et al., Kraus et al. (2019, p. 361; 362) point out the following: "The differentiation graduates from making use of digital assets to

a business, which is completely conducted online and thereby describes the degree to which those businesses operate in the digital world. Whilst mild digital entrepreneurs focus on digital products, delivery or other major digital parts constituting the business, extreme digital entrepreneurs conduct their entire business model online. Such digital pioneers not only digitize the goods or services themselves but also shift all business operations, such as production, advertising, distribution, transaction and customer relations into digitization." (Kraus et al., 2019, p. 361; 362).

The transition from traditional to virtual entrepreneurship can also be seen in the periodization of the development of digital entrepreneurship made by Kollmann et al. They set out three stages in the development of digital entrepreneurship - the Seed-Era (1990-2000), the Startup-Era (2001-2015) and the Expansion-Era (from 2016, which continues today). Kollmann et al., 2022, pp. 19-21). Each stage is characterized by its own distinctive features, revealing the degree of application of digital technologies in entrepreneurship. For example, according to the cited authors (Kollmann et al., 2022), the first stage (the Seed-Era) "marks the beginning of historical development in the field of digital entrepreneurship" and is primarily characterized by the establishment of internet technology. opportunity to "do business electronically". The start-up era is characterized by "the emergence of many new ways of using Internet technology such as open-source, social media platforms, mobile, LTE, and cloud computing."

Digitization of entrepreneurial activity in Bulgaria

A general characteristic of the digitalization degree in Bulgaria is given by the data of the DESI index (Digital Economy and Society Index) of the European Commission, which is observed in relation to the member states of the European Union. According to them, "Bulgaria ranks 26th (equal to Greece) out of the 27 EU countries in the European Commission's digital economy and society index (DESI) for 2021" with a score of 36.8, while the average for EU countries is 50, 7. (DESI, Bulgaria, 2021, p. 3). After Bulgaria, only Romania has the lowest result. The results of the index for the penetration of digital technologies in the economy and society in Bulgaria for the period from 2016 to 2020 show a significant lag compared to the EU average (Table 1).

Table 1. Results for the introduction of digital technologies in the economy and society of Bulgaria according to DESI for the period 2016-2020

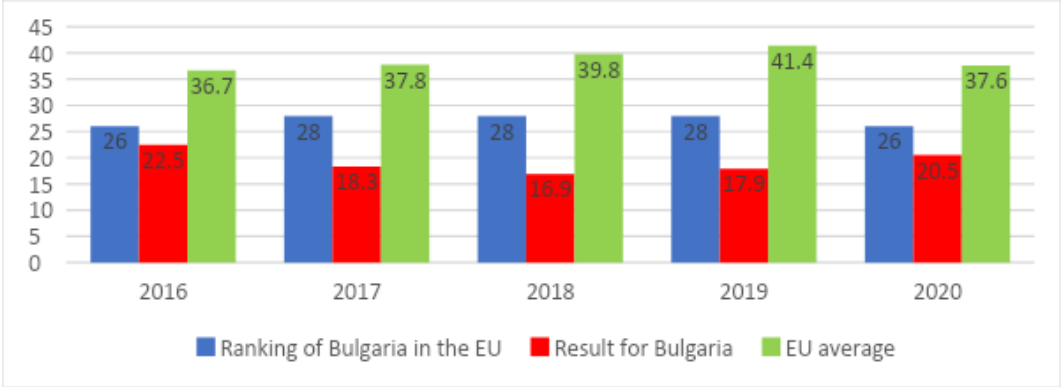
Year	Bulgaria		EU results
	Place among the EU member states	Results	
2016	27	32,4	46,9
2017	27	33,5	46,5
2018	28	33,8	49,4
2019	28	36,4	52,6
2020	26	36,8	50,7

Source: Digital Economy and Society Index (DESI). Thematic chapters, European Commission, 2021; Digital Economy and Society Index 2017 – Bulgaria; Digital Economy and Society Index (DESI) 2018 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2019 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2020 - Bulgaria; Digital Economy and Society Index (DESI) - Bulgaria, 2021

Note: Until 2019 inclusive data are reported also for the UK, which leaves the EU in 2020, and that is why Bulgaria is in 28th position

The Integration of digital technology indicator is also important for the digital transformation of the economy and business. According to this indicator of DESI, business digitalization and e-commerce are observed on the basis of the SMEs indicators with a basic level of digital intensity; Artificial Intelligence (AI); Cloud and Big data (Fig. 1).

Fig. 1. Results for Bulgaria according to the Integration of digital technology indicator of DESI for the period 2016-2020.



Source: Digital Economy and Society Index (DESI). Thematic chapters, European Commission, 2021; Digital Economy and Society Index 2017 – Bulgaria; Digital Economy and Society Index (DESI) 2018 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2019 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2020 - Bulgaria; Digital Economy and Society Index (DESI) - Bulgaria, 2021

Note: Until 2019 inclusive data are reported also for the UK, which leaves the EU in 2020, and that is why Bulgaria is in 28th position.

According to the indicator "Integration of digital technology" DESI monitors the indicators SMEs with at least a basic level of digital intensity (% SMEs), Electronic information sharing (% enterprises), Social media (% enterprises), Big data (% enterprises), Cloud % enterprises), Artificial Intelligence (% enterprises), ICT for environmental sustainability (% enterprises, having medium / high intensity of green action through ICT), e-Invoices (% enterprises), SMEs selling online (% SMEs), e-Commerce turnover (% SME turnover), Selling online cross-border (% SMEs).

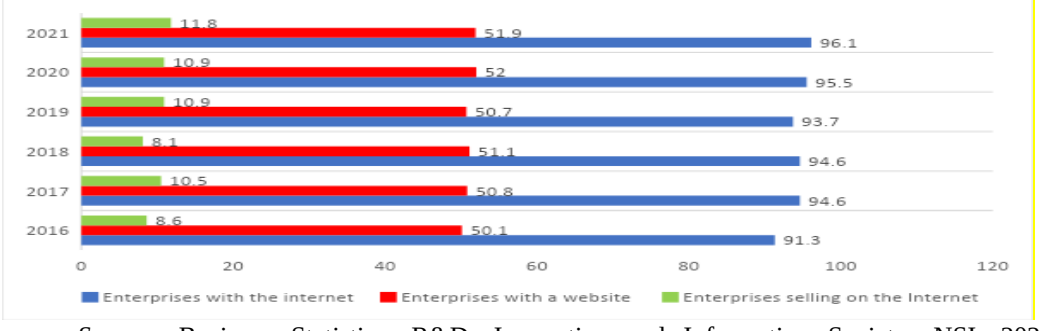
Against the background of the general backwardness of the country, a weak representation of Bulgarian enterprises in terms of digitalization is established. The results of the DESI index for 2020 for Bulgaria reveal that "the country is investing in research and digital infrastructure, but more enterprises" should be encouraged to use them.

It is a positive fact that the "use of artificial intelligence is more widespread than the EU average" - it is used by 31% of enterprises and is well above the EU average (DESI, Bulgaria, 2021, p. 3; 10). At the same time, however, according to data for 2020, there is a significant lag in regard to the integration of digital technology in enterprises. “Bulgaria ranks last among EU countries on this indicator:

- only 33% of SMEs have at least a basic level of digital intensity (while 60% do so in the EU on average);
- only 8% of Bulgarian SMEs sell online (below the EU average of 17%);
- only 3% of SMEs are selling across borders (versus 8% in the EU);
- only 3% of turnover comes from the online segment (against 12% in the EU);
- only 6% of enterprises use big data” (DESI), Bulgaria, 2021, p. 10).

The progress regarding the implementation of digitalization in Bulgarian enterprises, economy and society as a whole is established in detail on the basis of the observations of the National Statistical Institute (NSI) of the Republic of Bulgaria. The results represent the change for both small and medium and large enterprises for the period from 2016 to 2021 (Fig. 2).

Fig. 2. Total enterprises in Bulgaria with internet, website and online sales for the period 2016-2021, in percentages



Source: Business Statistics, R&D, Innovation and Information Society, NSI, 2021, https://nsi.bg

The statistical data of the NSI of Bulgaria show a very slow increase in the number of the three categories of enterprises according to their size (small, medium and large), which use the Internet, have a website and sell online. As can be seen from Table 2 of the indicator "enterprises with internet", the greatest progress is made by enterprises with 10 to 49 employees; while in the indicator “enterprises with a website” the medium-sized companies (with 50 to 249 employees) are significantly ahead of the other two groups, and in the indicator “enterprises with online sales” the largest progress is made by large companies (with 250 and more employees), followed by medium-sized companies.

Table 2. Comparative data on the availability of the Internet, website and Internet sales by categories of enterprises according to their size for 2021 compared to 2016, in percentage

Category: Enterprises by size	**Enterprises with internet by years**			**Enterprises with a website**			**Enterprises selling online**		
	2016	**2021**	**Variation**	**2016**	**2021**	**Variation**	**2016**	**2021**	**Variation**
Totally	91,3	96,1	+4,8	50,7	51,9	+1,2	8,6	11,8	+3,2
10-49 employed	89,7	95,4	+5,7	46,3	47,0	+0,7	7,9	10,7	+2,8
50-249 employed	98,4	99,3	+0,9	68,8	73,0	+4,2	11,2	15,8	+4,6
250 and more employed	99,8	100,0	+0,2	86,4	87,7	+1,3	17,4	23,3	+5,9

Source: Business Statistics, R&D, Innovation and Information Society, NSI, 2021, https://nsi.bg

Cloud services and social media are increasingly included in the tools of Bulgarian companies. Statistics show that the percentage of companies using cloud services and social media is growing much faster. The share of enterprises using cloud services in 2021 compared to 2016 increased by 6.1% (from 6.7% to 12.8%), while for small companies the increase is 4.5% (from 5.5 to 10.0%), for medium-sized companies it is 11.5% (from 11.1% to 22.6%), and for large companies it is most significant - 26.7% (from 17.9% to 44, 6%). The share of enterprises using social media in the same period increased by 7.2%. In terms of the size of enterprises, the situation is as follows: the share of small enterprises has an increase by 6.5% (from 22.8% in 2016 they reached 36.3% in 2021), medium-sized enterprises’ share increased by 9, 6% (from 39.4% to 49.0%), and for the large ones the increase is by 15.1% (respectively from 48.2% to 63.3%) (NSI, 2021).

Important features of the process of digitalization of entrepreneurial activity are also the analysis of big data, the use of electronic invoices, as well as customer information management software (CRM) and resource management software (ERP). Compared to 2016, in 2020 the trend is towards a decrease in enterprises performing big data analysis - in total for all enterprises, the absolute growth is negative (-0.9%). With regard to

enterprises, according to their size, it is also negative. The share of enterprises handling electronic invoices in total and the share by categories according to the size of enterprises also decreases (Table 3) (NSI, 2021).

Table 3. Comparative data for enterprises performing big data analysis and enterprises working with electronic invoices by categories of enterprises according to their size, in percentage

Category: Enterprises by size	Enterprises performing big data analysis by years			Enterprises working with electronic invoices		
	2016	2020	Variation	2018	2020	Variation
Totally	7,2	6,3	-0,9	12,5	10,0	-2,5
10-49 employed	5,8	5,0	-0,8	11,4	8,9	-2,5
50-249 employed	12,5	10,7	-1,8	16,7	13,8	-2,9
250 and more employed	23,1	21,4	-1,7	27,9	24,2	-3,7

Source: Business Statistics, R&D, Innovation and Information Society, NSI, 2021, https://nsi.bg

The digitalization of business processes is also related to the introduction of software for their management. In this regard, the idea of the introduction of digital technologies in enterprises is given by the observation of enterprises that use customer relationship management (CRM) software, as well as the use of resource management software (Enterprise resource planning - ERP). Statistics on both indicators reveal a downward trend for all enterprises after 2016 in the period from 2017 to 2021, which is due to the decrease in relation to small enterprises. Conversely, for medium and large companies during this period the value of these indicators increases (Table 4).

Table 4. Comparative data for enterprises that use information management software for customers and enterprises that use resource management software by categories of enterprises according to their size, in percentages

Category: Enterprises by size	Enterprises using CRM software by years			Enterprises using ERP software		
	2017	2020	Variation	2017	2020	Variation
Totally	18,6	16,9	-1,7	23,3	21,8	-1,5
10-49 employed	16,9	14,3	-2,6	20,0	17,1	-2,9
50-249 employed	25,7	27,9	+2,2	35,5	40,1	+4,6
250 and more employed	32,9	34,8	+1,9	59,2	65,2	+6,0

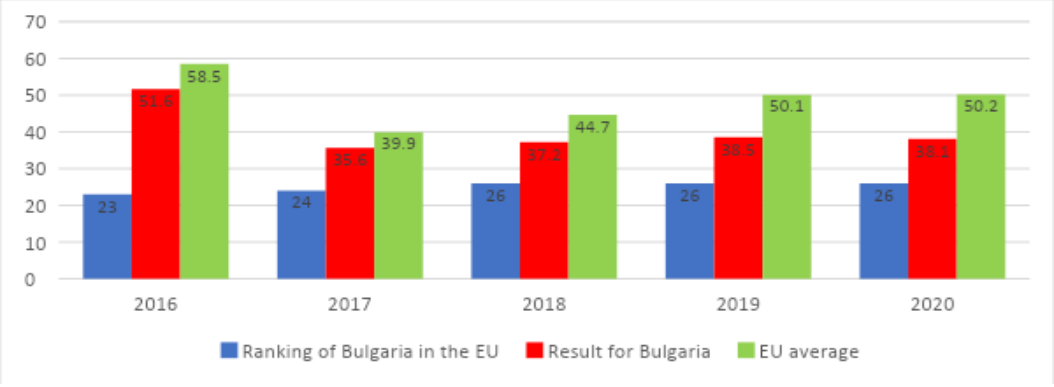
Source: Business Statistics, R&D, Innovation and Information Society, NSI, 2021, https://nsi.bg

Note: The NSI monitors the indicators from 2013. There are no data for 2016, as well as for 2018. For this reason, and in order to have some comparability with the information on the other indicators, we use the data after 2016.

The indicators "Connectivity", "Human capital" and "Digital public services" are of key importance for the successful implementation of digitalization processes.

According to the “Connectivity” indicator according to the Global Connectivity Index (GCI), which annually ranks 79 nations, in 2020 Bulgaria ranks 35th (Global Connectivity Index, 2020, p. 12), and within the EU according to the same indicator 2020, it ranks 26th out of a total of 27 member states (Fig. 2). According to the DESI connectivity index, it is observed in terms of fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices using the indicators "gigabit for everyone" (Fixed very high-capacity network coverage) and "5G coverage". For Bulgaria, the “connectivity” indicator for the period from 2016 to 2020 shows the following results (Fig. 3):

Fig. 3. Results for Bulgaria according to the "Connectivity" indicator of DESI for the period 2016-220.



Source: Digital Economy and Society Index (DESI). Thematic chapters, European Commission, 2021; Digital Economy and Society Index 2017 – Bulgaria; Digital Economy and Society Index (DESI) 2018 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2019 - Country Report Bulgaria; Digital Economy and Society Index (DESI) 2020 - Bulgaria; Digital Economy and Society Index (DESI) - Bulgaria, 2021

With regard to human capital, its training in the specific field of digital technologies and the availability of ICT specialists for the activities of enterprises must be taken into account. Compared to the average levels in the EU, Bulgaria lags behind in this indicator, firmly occupying the last position for the period from 2016 to 2020, except for 2017, when it is penultimate among the member states. Against the background of only 29% of people in Bulgaria aged 16 to 74 with at least basic digital skills (compared to the EU average of 56%), "enterprises still have difficulty finding skilled staff to innovate and grow", as ICT specialists and in 2020 are too few - 3.3% of individuals in employment aged 15-74, while for the EU they are on average 4.3%. Over the years, there has been a very slight increase in this percentage by 0.9% compared to the values in 2016. The reason for this low result

is that there are too few enterprises providing ICT training - for 2020 only 7% against 20% on average EU level. (DESI, Bulgaria, 2021, p. 3; 5)

The data of the NSI of the Republic of Bulgaria confirm and detail the results of DESI. Although the statistical survey shows a certain increase in the number of employees in enterprises that use computers and the Internet, the positive change is still slow. For example, the number of persons using computers for the period 2016-2019 (in this case the last year for which the NSI presents data is 2019) increased by 2.4%. The percentage of people using the Internet is ahead of schedule - for the same period (2016-2019) by 2.9%, and in 2021 its increase is 11% compared to 2016. The increase in this indicator applies equally to small and medium-sized enterprises and large ones while maintaining the leading position of Internet users (Table 5).

Table 5. Employees in enterprises in Bulgaria using computers and the Internet, in percentages

Category: Enterprises by size	**Employees in enterprises in Bulgaria using computers**				**Employees in enterprises in Bulgaria using the Internet**					
	2016	**2017**	**2018**	**2019**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
10-49 employed	30,8	32,0	33,3	32,3	27,7	29,0	30,6	29,9	35,2	38,0
50-249 employed	27,8	27,5	28,0	29,6	25,3	25,3	25,8	27,5	32,3	35,7
250 and more employed	30,3	30,7	32,8	34,2	24,5	25,7	27,6	28,7	33,6	36,8

Source: Business Statistics, R&D, Innovation and Information Society, NSI, https://nsi.bg
Note: The NSI presents data on employees in enterprises using computers until 2019.

The development of digitalized services in the public sector related to business activities is a very important condition for the growth of digitalization in enterprises. In 2020, "Bulgaria ranks 21st in the EU in Digital public services", as the "digital public services for businesses have a score of 87, slightly above the EU average of 84". (DESI, Bulgaria, 2021, p.12)

Conclusion and Recommendations

As it can be seen from the analysis of theoretical formulations and practical results, the digitalization of entrepreneurial business is a new way for its development. Comprehensive digital transformation outlines trends of radical change in business models and strategies, marketing management systems, the relationship between companies and customers, consumer behaviour, etc. and at the same time represents an effective model for crisis management (for example the crisis caused by COVID-19).

The digitalization of entrepreneurial activity can be considered in two ways - on the one hand, the introduction of modern digital technologies is an innovation that on the other hand causes a change in the type of business.

As a result of the wide application of digitalization in entrepreneurship, a number of positive effects are manifested, leading to increased opportunities for innovative business development. In general, in our opinion, some of them are related to: 1) the new digital technologies themselves; 2) the opportunities for increasing connectivity between organizations and between them and customers; 3) the ways of doing business; 4) the advantages for entrepreneurs in connection with the organization and management of business processes; 5) human resources. In particular, they are as follows:

1) The introduction of digitalization in entrepreneurship enriches the arsenal of technological innovations and improves the level of equipment with a new generation of digital technologies, such as cloud technologies, social networks, mobile applications, search engines, etc. which allow the activity to be carried out without its own IT infrastructure, tangible assets and software. It leads to the introduction of new business models (freemium, on-demand, crowdsourcing, crowdfunding). At the same time, it challenges the further development and improvement of digital technologies.

2) The ubiquitous introduction of digital technologies provides an opportunity for connection between entrepreneurs along with the entire value chain and between them and end-users of products and services through various platforms and networks and contributes to the development of a shared economy that facilitates: gathering and providing information; realization of economic relations between them; development of forms of cooperation; development of electronic services; overcoming territorial borders and entering foreign markets through online commerce, electronic trading and stock exchange systems; facilitating and simplifying the financial operations of companies through electronic payment systems, etc.

3) Digitalization creates an opportunity for new ways of doing business, concerning the relationship with the market and consumers, partners, all related organizations and institutions, as well as internal activities, their organization and management, coordination between units and associates. The introduction of new business models based on digitalization along with the traditional ones is essential to increase the competitiveness of companies, their sustainability and increase the potential for growth in a highly changing and unpredictable national, international and global environment. In these market conditions, those companies would remain that manage to completely replace or supplement the traditional ways of doing business with the introduction of digital forms. At the same time, start-ups based entirely on digitalization have a better chance of success.

4) The digitalization of business processes and their organization and management leads to the manifestation of such benefits for entrepreneurs as the creation of new types of products and services, transformation of existing and new industries, change in marketing management, improving business operations, reducing business time to carry out activities, reduce costs and costs, efficient use of resources, including human resources, increase productivity, develop new more effective strategies for future development of companies, increase profits and others and thus increase the useful value of business.

5) Digitalization as a new way of running an entrepreneurial business has an impact on human resources - requires high qualifications in this field, provides an opportunity to attract highly qualified professionals with the necessary skills to work in a digital environment to improve skills in this area and thus improves the intellectual potential of the enterprise. At the same time, it creates new jobs, changes working conditions, and more and more employers and employees prefer to work remotely, which supports the processes of increasing employment.

The presented statistical data and analyzes reveal the degree of penetration of modern digital technologies in the tools of entrepreneurial business in Bulgaria. Its extreme lag behind the average European level of digitalization shows that it is necessary to accelerate the process of digitalization in all indicators, including the preparation of human resources. To achieve this goal, it is important to develop a digital ecosystem, mindset and overall competitiveness, which according to the European Center for Digital Competitiveness are important components of the digital competitiveness of individual countries (Digital Riser Report, 2020, p. 8).

REFERENCES

Antonizzi, J., Smuts, H. (2020). *The Characteristics of Digital Entrepreneurship and Digital Transformation: A Systematic Literature Review*. In: Hattingh, M., Matthee, M., Smuts, H., Pappas, I., Dwivedi, Y., Mäntymäki, M. (eds) Responsible Design, Implementation and Use of Information and Communication Technology. I3E 2020. Lecture Notes in Computer Science, vol 12066. Springer, Cham. https://doi.org/10.1007/978-3-030-44999-5_20

Boyko I. P., Evnevich M. A., Kolyshkin A. V. (2017) Enterprise economy in the digital age, *Russian Journal of Entrepreneurship,* 18(7):1127-1136, https://doi.org/10.18334/rp.18.7.37769

Business Statistics, R&D, Innovation and Information Society, *NSI*, Retrieved March 9, 2022, from the National Statistical Institute Website: https://nsi.bg/bg/content/782/бизнес-статистика

Dashkov, L. P., O. A. Repushevskaya (2019**)** The impact of digital transformation on business, *Journal of the Russian University of Cooperatives, 4(38):*40-45,

https://cyberleninka.ru/article/n/vliyanie-tsifrovoy-transformatsii-ekonomiki-na-predprinimatelstvo

Davidson, E., E. Vaast, (2010). Digital Entrepreneurship and Its Sociomaterial Enactment, *43rd Hawaii International Conference on System Sciences*. *Honolulu, HI, USA* p. 1-10, https://doi.org/10.1109/HICSS.2010.150

Digital Economy and Society Index (DESI) 2021. Thematic chapters, *European Commission*, https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5481

Digital Economy and Society Index 2016 – 2021 Bulgaria, Retrieved March 9, 2022, from the European Commission Website: https://digital-strategy.ec.europa.eu/en/policies/desi-bulgaria

Digital Riser Report 2020, Berlin, Germany, 2020, European Center for Digital Competitiveness (Ed.), ESCP Business School, https://digital-competitiveness.eu/digitalriser/; https://digital-competitiveness.eu/wp-content/uploads/Digital_Riser_Report-2021.pdf

Dudin, M. N., Z. K. Omarova (2019) Digital entrepreneurship in the area of services and trade sector: essence, aims, tasks, evaluation of economic benefits, *CITISE 1(18)*, https://ma123.ru/wp-content/uploads/2019/03/Дудин-М.-Омарова-З.К.-Цифровое-предпринимательство.pdf

Giones, F., A. Brem, (2017). Digital Technology Entrepreneurship: A Definition and Research Agenda. *Technology Innovation Management Review, 7(5):44-51*, https://www.semanticscholar.org/paper/Digital-Technology-Entrepreneurship%3A-A-Definition-Giones-Brem/925c946bd53d472e1024755daeff39ceb7a5a59c

Global connectivity index 2020: Shaping the New Normal with Intelligent Connectivity. Mapping your transformation into a digital economy with GCI 2020, Huawei technologies Co., LTD., https://www.huawei.com/minisite/gci/assets/files/gci_2020_whitepaper_en.pdf?v=20201217v2

Hull, C.E., Hung, Y.-T.C., Hair, N., Perotti, V., DeMartino, R. (2007) Taking advantage of digital opportunities: A typology of digital entrepreneurship, *International Journal of Networking and Virtual Organizations, 4(3):290-303*, https://www.academia.edu/15460068/Taking_advantage_of_digital_opportunities_a_typology_of_digital_entrepreneurship

Kollmann, T., L. Kleine-Stegemann, K. de Cruppe, C. Then-Bergh, (2022). Eras of Digital Entrepreneurship. *Business & Information Systems Engineering 64:15–31*, https://doi.org/10.1007/s12599-021-00728-6

Kraus, S., C. Palmer, N. Kailer, F. L. Kallinger, J. Spitzer, (2019). Digital entrepreneurship. A research agenda on new business models for the twenty-first century, *International Journal of Entrepreneurial Behavior & Research 25(2):353-375*, https://doi.org/10.1108/IJEBR-06-2018-0425

Kuzmanova, M., A. Atanassov, (2021). Change management as an instrument in improving crisis sustainability of organisations in the information and communications technology sector:
the case of Bulgaria, *Economics and Management, 18(2):*63-87

Lobanova, Z. I., (2019). The development of the enterprise as a factor for increasing the competitiveness of the company. *Journal of Khabarovsk State University of Economics and Law 3(101)*:52–58, https://cyberleninka.ru/article/n/razvitie-tsifrovogo-predprinimatelstva-kak-faktor-povysheniya-konkurentosposobnosti-firmy/viewer

Nobanee, H., M. N. Dilshad (2020) Digital Entrepreneurship: Concepts, Applications, and Future Research Agenda, *Journal of Critical Reviews*, 7(19):4807-4817, http://dx.doi.org/10.2139/ssrn.3688271

Richter, K. K., N. V. Pakhomova, (2018) The digital economy as an innovation of the 21st century: Challenges and chances for sustainable development *Problems of modern economy 2 (66)*, 22-31. https://cyberleninka.ru/article/n/tsifrovaya-ekonomika-kak-innovatsiya-xxi-veka-vyzovy-i-shansy-dlya-ustoychivogo-razvitiya/viewer

Richter, C., S. Kraus, A. Brem, S. Durst, C. Giselbrecht, (2017). Digital entrepreneurship: Innovative business models for the sharing economy. *Creativity and Innovation Management. 26(3)*:300-310. https://am.booksc.org/book/66703630/3e5ba1

Santos, E. A., A. L. V. Torkomian, (2021, May/Aug.). Characteristics of the digital entrepreneur: a multicase study in startups. *International Journal of Innovation - IJI, São Paulo, 9(2):*219-238. https://doi.org/10.5585/iji.v9i2.18562

Satalkina, L., G. Steiner, (2020). Digital Entrepreneurship and its Role in Innovation Systems: A Systematic Literature Review as a Basis for Future Research Avenues for Sustainable Transitions, *Sustainability 12(7)*, 2764, https://www.mdpi.com/2071-1050/12/7/2764/htm

Schwab, K. (2016) *The Fourth Ingustrial Revolution*, World Economic Forum, Cologne, Switzerland

Soltanifar, M., E. Smailhodžić (2021) Developing a Digital Entrepreneurial Mindset for Data-Driven, Cloud-Enabled, and Platform-Centric Business Activities: Practical Implications and the Impact on Society, In: Digital Entrepreneurship. Impact on Business and Society. Springer Nature Switzerland AG, pp. 3-22, https://doi.org/10.1007/978-3-030-53914-6_1

Song, D., A. Wu, (2021). Pursuing International Opportunities in a Digitally Enabled World, In: Digital Entrepreneurship. Impact on Business and Society. Springer Nature Switzerland AG, pp. 265-281, https://doi.org/10.1007/978-3-030-53914-6_1

Soto-Acosta, P. (2020) COVID-19 Pandemic: Shifting Digital Transformation to a High-Speed Gear, *Information Systems Management*, *37(4):*260–266, https://doi.org/10.1080/10580530.2020.1814461;

Stavrova, E., D. Zlateva, L. Pinelova, (2021). Platform economy as an inevitable development of digital business, *Entrepreneurship, 9(1):87-95*

Ustinova N. G., (2019). Digital economy and entrepreneurship: problems of interaction. *SSSEU journal 3 (77)*, Saratov State Socio-Economic University

Zavrazhnyi, K., (2020). Areas for improvement of business models of industrial enterprises in the conditions of digital transformations, *Entrepreneurship, 8(1):74-82*