BRIDGING EU'S DIGITAL DIVIDE: THE CASE OF BULGARIA

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Abstract

Since 2014, the European Commission uses the Digital Economy and Society Index (DESI) as an important tool for monitoring of the digital progress of the EU-Member States. It measures the progress of the Member States in divergent areas such as human capital, connectivity, integration of digital technology and digital public services.

According to the 2022 data provided by DESI, Bulgaria is again ranked on the 26th place among the 27 EU-Member States. While there is some progress in certain areas, the country is still lagging in its overall digital development in comparison to the rest of the Member States. In this sense, the paper will focus on what are the prospects of Bulgaria to develop further in this field. Furthermore, the analysis define how Bulgaria can be more digitally integrated with the rest of the EU Member States rather than divided from them.

Key words: euro area, enlargement, economic crises, *digital divide, Bulgaria*

1. Introduction

The new digital technologies are used more and more in the everyday life and business relations. Today, they are essential for the communication between people, for purchasing goods and services, for financial transactions, for information storing as well as for interaction with the government. Nowadays, we organise virtual meetings that save time and resources for travel; we perform our payments usually via online banking services and we may pay digitally even our taxes. Furthermore, the COVID-19 pandemic accelerated those processes that were already in development.

However, digital technologies are far from equally spread among different social and business groups, or even among different countries and regions. Socially excluded or vulnerable groups rarely use digital resources in their everyday life. The multinational companies have significantly better access to digital technologies than

[1] This is a joined paper from Assoc. Prof. Kaloyan Simeonov and Ralitsa Stoycheva, PhD Student, including the introductory and concluding sections. Assoc. Prof. Kaloyan Simeonov focused his research on section 2 and 3 and Ralitsa Stoycheva on section 4 and 5. The opinions expressed in this paper are personal opinions of the authors and they do not engage the institutions in which the authors currently work.

the majority of the small and medium-size companies. Big cities and economically developed regions have greater opportunities for profiting from the rapid digital development than small cities and rural areas. Even the Member States from the European Union do not have equal access to digital technologies. Member States from North and West Europe are more digitally developed than those from South and East Europe. These differences create a digital divide.

What is a digital divide? Generally, digital divide is characterised as the gap between people and regions that have access to new information and communication technologies and those that don't.[2] In some cases, this phenomenon is not tackled properly and it increases even further among people, business, and countries, it may create more profound economic, social, and even political divide between them.

One of the difficulties in tackling this problem is measuring the digital divide. During the years, different international and local organisations established various indicators and indexes to evaluate and assess it. Their main goal is to identify the areas of digital gaps and ultimately to tackle them. In the context of the European Union (EU), the Digital Economy and Society Index (DESI) is the tool that evaluates the digital development of the Member States.

As an EU Member State, Bulgaria is also included in the results and assessments that DESI provides. While there is some progress in bridging the digital divide with the more digitally developed Member States, there are still a lot of challenges for the authorities, businesses and different social groups in Bulgaria.

The main goal of this paper is to outline the digital divide in Bulgaria compared to other EU Member States as well as to highlight the main challenges the country is facing and therefore, to provide policy recommendations how to tackle them. The next section will present DESI and its main characteristics. The text will then focus on where Bulgaria stands according to the EU statistics and DESI results. The paper will then outline some possible prospects for the country to bridge the digital divide by providing some policy recommendations. In the last part, it will draw a conclusion.

2. DESI - establishment and main characteristics

The Digital Economy and Society Index is used for monitoring the digital progress of the Member States by the European Commission since 2014.[3] The methodology of collecting and assessing the data did not change substantially since then. The index provides the opportunity for the EU and its Member States to track the development and the progress of each individual country and of the EU as a whole. DESI is divided in four main sections (pillars) - each of them further divided in several sub-indicators. This allows a close monitoring of the progress as well as of the concrete challenges that each individual EU Member State faces. The concrete indicators and their assessment also allow to make targeted decisions by the EU and national authorities in order to further improve the digital performance of EU institutions, national authorities and business organisations.

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[2] Kiara Taylor (2022), „The Digital Divide: What It Is, and What's Being Done To Close It", Investopedia.

[3] Source: https://digital-strategy.ec.europa.eu/en/policies/desi

The four main pillars of the Digital Economy and Society Index of the European Union are:

1. Human capital;
2. Connectivity;
3. Integration of digital technology;
4. Digital public services.

The COVID-19 pandemic further intensified the necessity to boost the efforts in the field of digitalisation in the European Union. The need for physical distance between the people made the demand for digital investments and innovations even more prominent. The European Union approved a recovery and resilience framework that aims to overcome the effects from the pandemic. Under this framework, each Member State adopted national Recovery and Resilience Plan. In accordance with the rules of that framework, a total 127 billion euro are allocated for digital transformation in the Union. The share of digital reforms of each EU Member States is defined by the national authorities but digital investments shall be no less than 20% of the recovery and resilience framework.

On average, EU Member States devote 26% of their recovery and resilience investments for digital transformation after the beginning of the pandemic. In some countries, this percentage reaches more than 30%. Examples are Austria, Germany, Luxembourg, Ireland and Lithuania.[4]

The latest DESI results, issued in July 2022, present data that was collected in the course of the previous year. In accordance with the European Commission analysis on digital transformation, the main shortcomings at EU level are in the areas of artificial intelligence, big data and development of connectivity infrastructure, including 5G. The usage of digital technologies by small and medium sized enterprises also remains a challenge.[5]

3. Bulgaria and DESI – a digital divide rather than a digital unity

Although Bulgaria has made progress in the Digital Economy and Society Index (DESI) since its creation in 2014, the country's low starting point makes this improvement insufficient. Even though Bulgaria's score improved by an average of 9% per year over the last five years, the country consistently ranks lower than the EU average in DESI rankings. The latter indicates a digital divide rather than a digital unity between the country and the other EU Member States.

As seen in the table below, Bulgaria tends to score the last or one of the last results according to DESI scores in the four main pillars of the index. There are some exceptions related to the improvement of connectivity as well as some positive results for digital

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[4] Source: European Commission (2023), „Shaping Europe's digital future. The Digital Economy and Society Index", Brussels, last updated on 6 January 2023.

[5] Source: European Commission (2022), „Digital Economy and Society Index 2022: overall progress but digital skills, SMEs and 5G networks lag behind.", Press Release, Brussels, 28 July 2022.

public services. The following table represents the DESI results as a whole as well as separately for its four main pillars over the last three years. The data for Bulgaria is compared to the EU average. The ranking for 2020 includes 28 EU Member States (also United Kingdom) and those for 2021-2022 are in the context of EU-27.

Table: DESI and Bulgaria – general results (2020-2022 r.) [6]

Total DESI	**Bulgaria**		**EU**
	Rank	**Score**	**Score**
DESI - 2020[7]	**28**	**36.4**	**52.6**
DESI - 2021	**26**	**36.8**	**50.7**
DESI - 2022	**26**	**37.7**	**52.3**
1. Human capital	**Bulgaria**		**EU**
	Rank	**Score**	**Score**
DESI - 2020	26	33.9	49.3
DESI - 2021	27	32.7	47.1
DESI - 2022	26	32.6	45.7
2. Connectivity	**Bulgaria**		**EU**
	Rank	**Score**	**Score**
DESI - 2020	26	38.5	50.1
DESI - 2021	26	38.1	50.2
DESI - 2022	19	50.7	59.9
3. Integration of digital technology	**Bulgaria**		**EU**
	Rank	**Score**	**Score**
DESI - 2020	28	17.9	41.4
DESI - 2021	27	20.5	37.6
DESI - 2022	26	15.5	36.1
4. Digital public services	**Bulgaria**		**EU**
	Rank	**Score**	**Score**
DESI - 2020	23	61.8	72.0
DESI - 2021	21	56.0	68.1
DESI - 2022	25	51.9	67.3

[6] Sources: European Commission (2020), „Digital Economy and Society Index (DESI) 2020. Bulgaria", Brussels, Belgium; European Commission (2021), „Digital Economy and Society Index (DESI) 2021. Bulgaria", Brussels, Belgium; European Commission (2022), „Digital Economy and Society Index (DESI) 2022. Bulgaria", Brussels, Belgium.

[7] DESI 2020 within the EU still includes in its analysis the United Kingdom, therefore the average score of the EU comprises EU-28. DESI 2021 and DESI 2022 comprises EU-27, i.e. without the United Kingdom.

As a rule, Bulgaria ranks as one of the three worst performing EU Member States in the majority of indicators. The other two countries with similar results are Greece and Romania, the two neighbouring countries from the Southeast Europe. The fact that the region as a whole has the lowest digital results in the Union highlights a further problem. On the opposite side, the most digitally developed countries in the EU are Finland, Denmark, the Netherlands, Sweden and Ireland that are predominantly from the northern part of Europe.

In accordance with the European Commission assessment, some of the main challenges for Bulgaria in relation to its efforts for digital transformation are as follows:

- low basic digital skills among the main society groups;
- number of information and communication specialists in the workforce;
- percentage of the enterprises that use big data, cloud services and artificial intelligence;
- the number of e-government users.

These challenges are related to the four main pillars under the Digital Economy and Society Index. Another very important challenge is the fact that there is unequal distribution of digital competences and results among different regions in Bulgaria. The capital and some big cities perform digitally much better than the other regions in the country.

However, there are also some areas where Bulgaria performs relatively well in the recent years. Some of these areas are:

- female information and communication specialists, where Bulgaria scores a result that is higher from the EU average;
- percentage of households with fast broadband coverage;
- percentage of households with fibre to the premises coverage.

The challenges for Bulgaria in relation to the digital transformation for the moment are rather substantial. Some digital advancements of the country do not change substantially the overall picture. Therefore, Bulgaria shall intensify its efforts towards digital convergence, narrowing the gap with the rest of the EU.

4. The Road Ahead: Bulgaria's Digital Agenda

In order to evaluate the prospects for Bulgaria to bridge the digital divide, the country's digital agenda must come into focus first. As seen in the previous sections of this paper, there is progress in the digital development of Bulgaria in recent years. To a high extend, this is due to its membership in the European Union. This provides the opportunity for the country to benefit of the structural funds and programs of the Union, thus, receiving substantial investments for new technologies and digital progress.

Yet, in order to achieve substantial progress in the area, the impetus must come also from the national policies. Currently, the country has a well-defined digital agenda. The current priorities are prescribed in the National Program „Digital

Bulgaria 2025" and the Roadmap for its implementation.[8] This program was adopted in 2019 and it is a continuation from a previous 2015 strategic program. The program for Digital Bulgaria 2025 has six main priority areas:

1. Establishment of appropriate conditions for the development and accessibility of digital networks and services;
2. Developing a dynamic and innovative digital economy and increasing its growth potential;
3. Enhancement of digital competence and skills;
4. Ensuring effective and high-quality public e-services for business citizens and government;
5. Promoting a secure cyber ecosystem: addressing the challenges of cybersecurity;
6. Internet governance.

Some of its main objectives include but are not limited to new regulatory framework for electronic communications, overcoming regional disparities by stimulating investment in ICT infrastructures and technologies, digitalisation of Bulgarian industrial sectors and related services and development of a data-based economy, etc. Some positive development in recent years is the establishment of a special Ministry for e-Government that focuses on the digital policies as well as a digital government web portal (egov.bg portal). The strategic goals of the programme „Digital Bulgaria 2025" to a high extend are covered also by the national strategic document „Digital Transformation of Bulgaria for the period 2020-2030".[9]

Additionally, the latest version (from April 2022) of the National Recovery and Resilience Plan foresees the allocation of 23,6 % of the total investments planned for the digital transition[10]. This is divided in four main pillars:

1. Deployment of Broadband Infrastructure
2. Enhancing the Digital Skills of the Population
3. Accelerating the Deployment of Digital Technologies in Enterprises
4. Deployment of e-Government and e-Services

As seen, these pillars coincide with the main areas in which, according to DESI, Bulgaria is falling behind. The National Recovery and Resilience Plan foresees key reforms and actions in most of these areas. Some examples are the reform in pre-school and school education, which will be adapted to the rapid technological development - both in terms of development of digital literacy and skills and improvement of the school facilities; the development and implementation of effective

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[8] Council of Ministers (2019), „National Program „Digital Bulgaria 2025" and Road map for its implementation". These documents are adopted by Council of Ministers Decision №730/05-12-2019.

[9] Ministry of Transport and Communications (2020): „Digital Transformation of Bulgaria for the period 2020-2030". This document is adopted by Council of Ministers by decision № 493/21.07.2020. (https://www.mtc.government.bg/en/category/283/national-strategic-document-digital-transformation-bulgaria-period-2020-2030-0)

[10] National Recovery and Resilience Plan (https://www.nextgeneration.bg/14)

policy and regulatory framework in the field of digital infrastructure; building a mechanism to attract industrial investments and develop industrial ecosystems as well as the promotion and further development of e-Government and e-Services. There are further documents that cover the same issues and highlight the same areas of strategic action needed. All of them are clear signs for the recognition of the existing gaps in Bulgaria.

However, many of the existing challenges come from the complicated political situation in Bulgaria. Over the course of the past two years (April 2021 - April 2023), there were five parliamentary elections in the country. For the majority of this time, there was an interim government appointed by the President with regular government in power for less than 8 months (13th December 2021 - 02nd August 2022). Without a doubt, this political situation and constant changes of governments and members of Parliament influenced the institutional capacity to successfully implement the digital agenda of the country. Moreover, the country was facing the danger of not receiving the whole funding under the National Recovery and Resilience Plan whose submission by the Bulgarian government has been delayed several times and the plan itself has also been repeatedly revised. This would have inevitably also influenced the implementation of the Bulgarian digital agenda. In this context, the lack of continuation of the policies connected to the digital transformation of the country might result in even deeper digital divide of Bulgaria with the other Member States.

5. Policy recommendations for Bulgaria

In this context, the results by DESI provide the opportunity for the country to collect and compare data regarding its digital development in the EU context, thus, being able to identify the exact areas in which it lags behind. The results of the Index not only present a realistic view on where Bulgaria is standing but they also help to identify the specific areas that need appropriate decisions for further digital improvements.

One of the main areas, in which Bulgaria is falling behind in comparison not only to the EU average but to almost every Member State is digital literacy and skills.[11] All of the described in the previous section documents clearly show that the state authorities are recognising this as an existing issue and is willing to put efforts in overcoming it. To some extent, they put highlight in the field of incorporating the digital literacy and skills in the school system as well as providing the necessary for these purposes facilities. In terms of facilities, their advancement in response to the rapid technological development is foreseen. However, all strategies fail to address the issue of teachers' possibility to adapt to these changes and implement this into practice - both in terms of the insufficient young people oriented towards this profession and the digital literacy and skills that the older generation of teachers have. While the efforts are foreseen towards the students, the focus should be first put to the working staff at schools and pre-schools and how to advance their digital literacy and skills.

[11] Yurukova, M., Stoycheva, R. (2022), „Digital Literacy Gaps in Member States as a Barrier to Implementing the EU Digital Strategy", In: Collection of reports, Sofia, 2022.

It must be said that the National Recovery and Resilience Plan foresees providing digital skills training and creating adult learning platform. However, the total amount of people that will be included, is insufficient for „catching up" with rest of the EU - training of 500 000 and validation of basic and intermediate level digital skills and competencies to at least 100,000 individuals. Moreover, it must be ensured that all individuals have equal information and fair access to this programme - an issue that remains open. While the funding, both coming from the EU and the one from the state itself, will not be sufficient to cover the whole Bulgarian population, the government can partner and encourage the private sector for developing training programmes that are adapted to the needs of business.

Investments in the digital infrastructure are also crucial for bridging the digital divide. What is more, the country must ensure that the digital infrastructure is accessible to all, regardless to their location or income level. As of December 2022, 88.8% of the households in the cities have internet access with this number falling to 82.4% in rural areas.[12] In comparison, the EU average is 93% and the country with the highest level of internet access is Netherlands with 98%.[13] A special focus is also put on the broadband access. A positive trend is that the internal division - between the urban and rural areas in Bulgaria in terms of the existing digital infrastructure, are taken into consideration. However, there are two main issues that should be addressed in this field. First, improvements in digital infrastructure and connectivity should keep pace with current technological developments. In this sense, investments in outdated technologies should not be made. This has a close relationship with the second issue - funding procedures for projects in the area should be conducted under strict and fair conditions for those involved. Furthermore, encouraging innovation and entrepreneurship is also of high importance. In a sense, this could be an impulse for economic growth and job creation. In order to efficiently encourage the innovation and entrepreneurship, Bulgaria must create a supportive environment. This includes funding for startups and SMEs, the establishment of incubators and accelerators, and fostering a general culture of entrepreneurship.

Promotion and improvement of e-government services should also be continued in order to improve the efficiency and transparency of government operations. It is essential that there is a broad information campaign to make citizens aware of the benefits and opportunities that e-government will provide. This is of key importance especially for the older part of the population, for those with a lower level of education and also for the minorities.

Another key issue in ensuring the appropriate level of cybersecurity. This, however, should be implemented without turning the usage of e-government services into a slow and complicated for the general society procedure as in such case many will be discourages to use them. National digital documents of strategic importance shall be updated more frequently, considered how fast the digital environment is changing.

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[12] Source: National Statistical Institute (https://www.nsi.bg/bg/content/2808/достъп-на-домакинствата-до-интернет)

[13] Source: Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_households_and_individuals)

These strategic documents shall be amended and updated once in every three years rather than once in every five years. Regular exchanges of experience with countries such as the Baltic States, which are some of the best examples in the field of e-government services in Eastern Europe, will also provide useful perspectives for the Bulgarian policy makers.

As mentioned above, the digitalisation processes are developing at high pace and impact different fields of the economy and the society. Currently, the main focus in Bulgaria remains on the development of digital literacy and skills, improving the digital infrastructure and connectivity, embracing the e-government services and creating supporting environment for businesses. In the meanwhile, the issue of Artificial Intelligence (AI) is not included on national level. Official information about this topic can be found in the „Concept for the Development of Artificial Intelligence in Bulgaria by 2030" presented in 2020[14]. The topic is also briefly mentioned in the National Recovery and Resilience Plan, but it is not recognised as a separate field of interest. However, there were some significant developments in this area in the first months of 2023 which highlight the need for a clear vision and concrete policies. There are some Member States of the EU who already adopted national strategies regarding the development of AI. In this sense, Bulgaria must quickly adapt to these changes and take corresponding early measures in order to avoid falling behind again.

Yet, the most important thing remains the persistence and continuation in implementing the national digital agenda as well as the effective pursue of national interests at European level. The setting of the EU targets for the digital development and transformation of the Member States fails to consider the different starting points of the countries. This being said, it would be harder for Bulgaria to „catch up" compared to other Member States that are also bellow the EU average but still closer to the set targets. The rankings that DESI provides could be a useful tool for policy makers for identifying the areas in which more action is needed. The structural funds and programs provided by the EU are irreplaceable means for achieving digital progress. But only a well-functioning government and a working parliament with vision for the future can use and allocate these means to the proper areas, thus, ensuring the bridging of the digital divide with the rest of the EU.

6. Conclusion

The rapid digital development in the recent years, which was further accelerated by the COVID-19 pandemic, transformed the global economy. It opened up many new possibilities - higher connectivity, increased e-commerce, smart technology, fast financial services, e-government services, etc. However, digitalisation also highlighted many challenges as for example the access to digital infrastructure, digital skills and literacy, cybersecurity, etc.

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[14] Ministry of Transport and Communications (2020): „Concept for the Development of Artificial Intelligence in Bulgaria by 2030". This document is adopted by Council of Ministers with written statement №72/ 16.12.2020. (https://www.mtc.government.bg/en/category/157/concept-development-artificial-intelligence-bulgaria-until-2030)

In order to tackle these challenges, the EU identified the digital transformation as a priority in the development of the Union for next decade[15]. The targets and objectives of the Union are divided in four areas: skills, infrastructure, business and government. In order to monitor the progress of the Member States, the European Commission is using the Digital Economy and Society Index (DESI). DESI annually provides valuable information about the progress of the Member States in different areas. Furthermore, the index clearly draws a picture on the digital divide among the countries of the EU - with the gaps in some areas being enormous. Over the years, the Index proved itself to be a useful benchmark for assessment of the digital performance of the Member States.

While there is some progress in recent years, Bulgaria continues to be on the last positions in the majority of indicators. In some areas, the country even scores two times lower than the EU average. Yet, the country has a well-defined digital agenda which covers the main areas that will be developed in the future. Bulgaria will also be able to use EU structural funds and programs in order to accelerate the internal digital transformation.

However, the progress of the country as well as it is „catching up" with the rest of the Member States, thus, bridging the digital divide, to a high extend remains a complicated task. It can be argued that the key problems are recognized on a state level - as proven by several official documents. Key issues are yet to be tackled. Moreover, rapid technological developments require adaptation, flexibility and fast reaction from the policy makers - something that currently remains open for discussion. A lot also depends on the political will, the functional implementation of the national agenda and the effective allocation of the EU funds. DESI provides the base information needed by policy makers. In this sense, the political measures for overcoming the digital divide must be comprehensive, integrated and sustainable.

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[15] The period 2020-2030 is even called „Europe's Digital Decade". (Source: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en)

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