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Examining the potential benefits of the National Recovery and Resilience Plan on the socioeconomic systems of the Republic of Bulgaria

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

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Abstract

The Recovery and Resilience Facility, part of the temporary instrument Next Generation EU, is designed to stimulate the recovery process of the Member States in the European Union, caused by the COVID-19 pandemic. The crisis resulted in both social and economic systems, putting the world on hold. One of the least developed Member States, according to GNI per capita and Human Development Index, is Bulgaria. The National Recovery and Resilience Plan of the Republic of Bulgaria has the ambition to restart the country's economy, designing four main pillars in accordance with the specific recommendations of the European Commission. Digital connectivity, innovation, low-carbon economy, social inclusion, business environment, are some of the objectives outlined in the National Recovery and Resilience Plan, designed to develop the resilience of the socioeconomic systems of the country. Due to the newness of the Plan and limitations of data, a qualitative research approach has been chosen and for the aim of this study, four expert interviews have been conducted. Having a minimum amount of 20% for digital objectives, set by the EC, the findings show digital transformation will highly contribute to higher productivity and efficiency, booster for the economy, increase of competition and resilience of the economy, connectivity among people, transparency in governmental activities and new job opportunities in Bulgaria.

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List of Abbreviations

ASGS- Annual Sustainable Growth Strategy

COVID-19- Coronavirus disease 2019

DESI- Digital Economy and Society Index

EC- European Commission

EU- European Union

GDP- Gross Domestic Product

GNI- Gross National Income

HDI- Human Development Index

IMF- International Monetary Fund

MFF- Multiannual Financial Framework

MS- Member States

NGEU- NextGenerationEU

NRRPRB- National Recovery and Resilience Plan of the Republic of Bulgaria

QoL- Quality of Life

RQ- Research Question

RRF- Recovery and Resilience Facility

RRP- Recovery and Resilience Plan

SDGs- Sustainable Development Goals

SMEs- Small and Medium-sized Enterprises

UN- United Nations

UNDP- United Nations Development Program

GDPR- General Data Protection Regulation

CMRB- Council of Ministers of the Republic of Bulgaria

1 Introduction

1.1 Background information

Recovery and resilience are two different aspects of the same situation. Resilience is “the capability of a strained body to recover its size and shape after deformation caused especially by compressive stress” (Merriam-Webster; n.d.). Recently, the coronavirus disease caused disruption of both social and economic systems, as well as in the citizens comprehensive quality of life. To sustain the wellbeing of citizens, the economy was put on hold, by closing down businesses, borders, limiting social interactions between people and overall, the normal lifecycle of people was significantly harmed. In the past decade, most of the countries were striving for various objectives, related to sustainable development, but the COVID-19 pandemic significantly hindered their accomplishment and moreover, has accentuated their vulnerability (Ibn-Mohammed et al., 2020). The global pandemic seriously disturbed the strength of the socioeconomic systems, displaying the lack of resilience and unpreparedness to upcoming challenges (Tisdell, 2020; Ibn-Mohammed et al., 2020).

Europe was hit by the disease in the first half of 2020 and the International Monetary Fund (IMF) evaluated the upcoming negative economic impacts as more severe than the ones from the Great Depression of the 1930s (Ladi & Tsarouhas, 2020). Therefore, the Commission of the European Union was determined to take immediate action, in the name of sustaining the health sectors and socioeconomic systems of each Member State and limit the negative impacts as little as possible (European Commission, 2020a) Accordingly, various strategies and budgets, developed by the European Commission, have been adopted, with the main objectives of economic recovery, growth,

innovation and digital objectives, social coherence, industry, agriculture, border defense, migration, reduction of climate fluctuations (EU2020.de, 2020; Rodríguez, n.d.). A temporary recovery package, which was proposed in May 2020 and adopted few months later, called "NextGenerationEU", totaled 750 billion Euro and is designed to jump start the economies of the EUs MS. The centerpiece of this package is the Recovery and Resilience Facility, with the extraordinary €672.5 billion (European Commission, 2020c). The pandemic has raised questions, related to the efficiency of the socioeconomic systems, which has led to a pressured demand for transformation and development (Dokov et al., 2020). Therefore, the main objectives of the Recovery and Resilience Facility include mitigating the negative socioeconomic impact, the COVID-19 crisis has caused, in addition to restoring the potential for economic development and accomplishing competitive sustainability and resilience (EC, 2020c). Each Member State is obliged to develop a National Recovery and Resilience Plan, where two essential requirements are included- at least 37% of the total budget allocation of each country should be related to green transition (climate) and a minimum amount of 20% for digital objectives, to move towards digital transition and follow the path of sustainable and inclusive economy.

1.2 Purpose of research and research questions

One country in particular would be analyzed in more detail- Bulgaria. At of the time of writing this thesis, the outcomes of the National Recovery and Resilience Plan of the Republic of Bulgaria are unknown, because it has not been yet implemented and research due date has not been yet conducted. Therefore, the purpose of this thesis is to examine the potential benefits of the National Recovery and Resilience Plan on the socioeconomic systems of the country, with an emphasis on digital

transformation. Therefore, two research questions have been developed to guide this thesis:

RQ1: *How would the National Recovery and Resilience Plan improve the resilience of socioeconomic systems in Bulgaria?*

RQ2: *What is the expected impact of digitalization described in the National Recovery and Resilience Plan on the Bulgarian socioeconomic systems?*

With the focus on answering the research questions and evaluating the study effectively, gathering most relevant and comprehensive information is essential. Therefore, primary data would be collected by conducting four expert interviews, following a qualitative research approach. This method is chosen due to the newness of the topic and the limited available information; thus, it is essential to gain further understating the Recovery and Resilience Facility and the main objectives of digital transformation. Furthermore, a transformative worldview will guide the research method, due to the relation of the topic to politics and change in individuals lives.

The thesis is split into 6 parts:

The first section of this paper is the introduction, which is designed to introduce a brief background information about the topic, in addition to the purpose of the study. Secondly, a literature review is conducted, where secondary data is collected. The first part of the literature review explains few important systems theories and provides a greater overview of the COVID-19 impact on the socioeconomic systems. Furthermore, a discussion related to the adoption of strategies and budges, designed by the European Commission are discussed. This discussion is divided into

two parts: pre-COVID-19 and post-COVID-19. The reason for that is to gain further insight on whether the pandemic has changed the priorities of the EU or has followed the priorities before the outbreak of the pandemic. At the end of the first subsection of the literature review, a comprehensive analysis of digital objectives is conducted, giving a background information about the terms, related to digitalization and digital transformation. The second part of the literature review is fully dedicated to exploring Bulgaria, the level of development and digitalization of the country, in addition to the socioeconomic impact of the pandemic reported by the country. Furthermore, the National Recovery and Resilience Facility is analyzed and discussed, with a further emphasis on digital objectives. The third part of this research is the methodology, where a theoretical analysis is conducted. Furthermore, the research design, data collection, limitations and research ethics are addressed. The last part of the methodology is dedicated to analyzing the data collected and discussing the findings. Finally, a conclusion is drawn, in addition to outlining limitations of the study and providing recomendations for future research.

2 Literature review

The following section of this thesis is dedicated to explaining the theoretical background of the topic, using secondary data. The literature review is divided into several sections, beginning with systems theory, for the purpose of obtaining further knowledge about the main systems and components linked to the observed Recovery and Resilience Facility. Secondly, the next segment is dedicated to explaining the challenges the socioeconomic systems faced with the outbreak of the coronavirus pandemic, which began in 2019. Thirdly, discussing the various plans, strategies and funding programs of the European Union is an important

section of the literature review, with the intention of further understanding the RRF. Digitization, digitalization and digital transformation are different processes, which are defined and described. Furthermore, Bulgaria is introduced, and an overview of the country is discussed, as well as the level of development and digitalization compared to the other Member States is analyzed, using various development measures. The last part of the literature review has the aim to analyze the National Recovery and Resilience Plan of the Republic of Bulgaria and discuss the digital objectives outlined in the Plan.

2.1 Systems theory

This segment of the literature review has the aim to explain the socioeconomic systems theory, quality of life theory, as well as resilience theory. Systems theory, as described more than forty years ago by Leighninger (1978), refers to the study of uniting interconnected systems, into wider complex system. Socioeconomic systems are an example of systems theory (Burns & DeVillé, 2017), which would be further discussed.

Gibson (2016) describes social systems theory as part of social science, the examination of society as a complicated organization, formed from components, incorporating the individuals and their ideologies and convictions, as they come together as a whole. From an empirical point of view, social systems are perceived as open systems, involved in the complex process of exchange with systems, related to culture, behavior and personality in the physical environment (Parsons, 2007).

Another social science, according to Hayes (2020), is called “economics” and it is responsible for the manufacture, supply and utilization of goods/ services. The resource allocation, the different

stakeholders (individuals or organizations) make, is what this social science examines (Hayes, 2020). Bouchrika (2020) claims that the way the economy of each country functions, it can measure the achievement of the commonwealth and the life quality. Each country has a determined economic system, and it depends how would the resources be allocated (Agarwal, 2020). Traditional, command, market and mixed economic systems are the four main types (Bouchrika, 2020). The mixed economy system is the most popular and proven to be successful, as countries like the United States, China, Japan and Germany have (Bouchrika, 2020). This type of economic system is a mixture of market and command economy, where the socialist and capitalist approaches are integrated (Agarwal, 2020).

2.1.1 Socioeconomic systems

In IGI Global Publisher of Timely Knowledge (n.d.) socioeconomic systems are described as "a complex system that consists of social, economic, environmental, cultural, political, technological elements and relationship among them and with other systems". According to Omann and Spangenberg (2002), the social, environmental and economic systems are key aspects of sustainable development.

The socioeconomic systems are looked on as complicated, flexible and adaptive (Giampietro & Mayumi, 1997) and as Hellmich (2017) states, the meaning of the term "socioeconomic" can differ, depending on the field of study. However, the main concept refers to the additive of economics with the support of another social discipline (Hellmich, 2017). A system being practical, systematic, driven and organic, can be considered as efficient in short and long-term period (Moseiko et al., 2015). Moreover, Stroeva et al. (2015), states that the executive of inventive activities in socioeconomic system can be considered as

efficient, once it is recognized in the index of innovational evolution and the potential of the region.

2.1.2 Quality of life

The theory of Quality of Life (QoL) is indubitably important target, when talking about economy, environment and sociology (Pinto et al., 2017). However, different authors describe the concept variously, depending on the field of study. Pinto et al. (2017) states most of the authors associate the concept of QoL with the personal recognition of different circumstances, related to the individual's life, which can be on a physical, psychological or social level, as well as personal beliefs, culture and environment. According to Ventegodt et al. (2003), quality of life is tightly linked to having a life with high quality, which means good life. Skevington (2007) claims that the concept of QoL is often understood as standard of living, which term is commonly associated with wealth. However, the exitance of the connection between quality of life and standard of living can be argued, because it has been observed that countries with high standard of living do not increase the individual's quality of life (Skevington, 2007). Nonetheless, many theories incorporate well-being and health as part of QoL (Pinto et al., 2017).

Ventegodt et al. (2003) acknowledges that quality of life is not a single factor, but consistent of many and therefore divides the concept into three different groups and subgroups, which is represented in Figure 1.

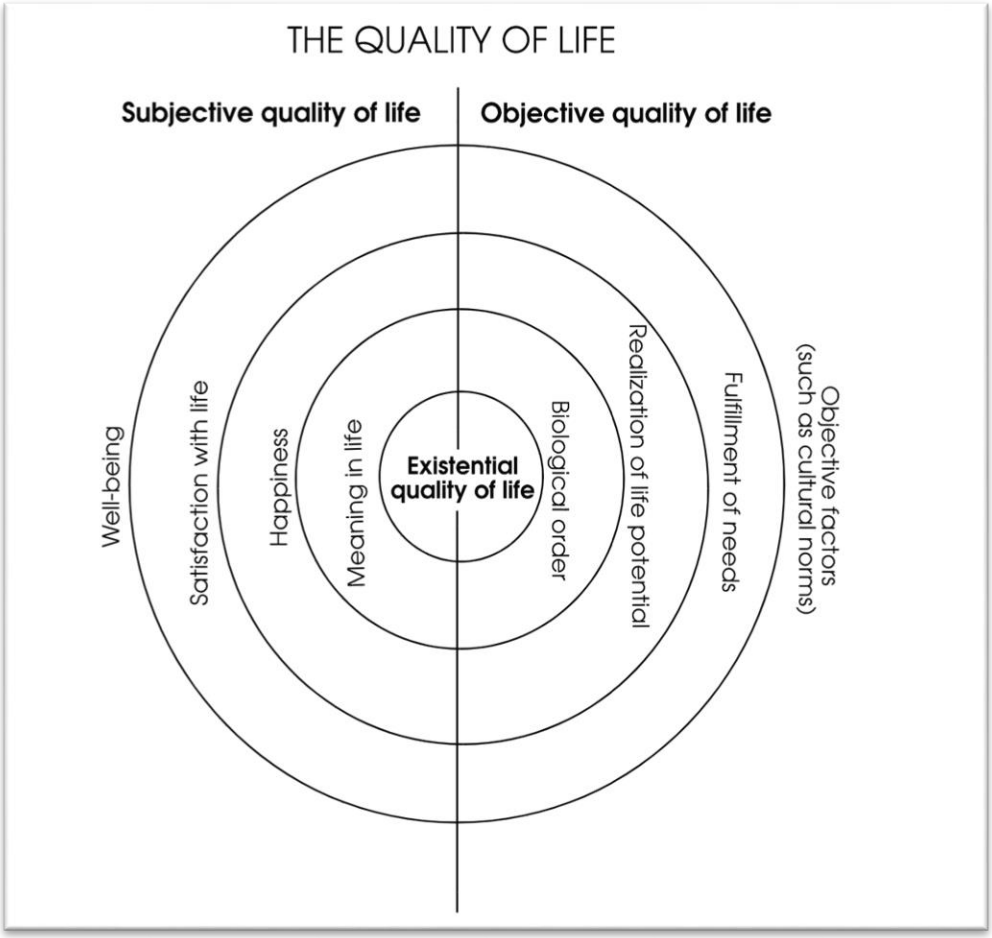


Figure 1.
(Ventegodt et al., 2003)

Subjective, objective and existential quality of life are the three groups that Ventegodt et al. (2003) outlines. The "subjective quality of life" is related to the feelings and satisfaction each individual experience in life (internal). Secondly, the "objective quality of life" suggests how the life of an individual is recognized externally, which is impacted by culture and values (Ventegodt et al., 2003). The third group includes subgroups,

which are on a religious and spiritual level, and therefore called the "existential quality of life", evaluating an individual's life on a deeper level (Ventegodt et al., 2003).

A study from Pardeller (2020) concludes, that in order to sustain a good quality of life, resilience is an essential part of the concept. Therefore, the next section has the aim to explore resilience theory and its importance.

2.1.3 Resilience theory

The terms "resilience" and "sustainability" are often confused to be complementary or the other extreme of having nothing in common. Therefore, Marchese et al. (2018) analyses both terms and evaluates their similarities and dissimilarities.

On the one hand, according to Marchese et al. (2018) and Redman (2014), sustainability science has the aim to pitch the main challenges society meets, with the objective of protecting the well-being of the biodiversity and natural cycle of life. On the other hand, resilience theory is described as the potential of a system to prepare for facing difficulties, experience disturbance, while remaining stable and undistorted (Redman, 2014; Marchese et al., 2018).

Van Breda (2001), Carlson (2012) and Marchese et al. (2018) agree, that different authors have various definitions of resilience theory, depending on the field of study. Van Breda (2001) has also reviewed resilience in many different aspects, such as individual and family resilience, resilient societies and others. Furthermore, Carlson (2012) states that the conducted research related to resilience is mainly focused on society, regions and "critical infrastructure", as well as different system components (social economy, governmental institutions etc.). Sherrieb et al. (2010) connects economic development and social capital as part

of the key factors leading to community resilience. The term has also various definitions, however, Sherrieb et al. (2010) interprets community resilience as the capability of a community/ society to soak up and recover from relentless stress, which was recently observed, consequently to the Coronavirus pandemic.

2.2 The COVID-19 impact on the socioeconomic systems

Coronaviruses are infectious RNA viruses, known for affecting humans and animals and they were first recognized in 1966 (Velavan & Meyer, 2020). The coronavirus disease 2019, SARS-Cov-2, also known as COVID-19, is an infectious disease, which can lead to permanent condition or death (World Health Organization, 2021). It was originally an animal virus, which made a transition, infected a human in China and by the beginning of 2020, an international health crisis was declared (Velavan & Meyer, 2020). The normal cycle of life began its disbalance with the eruption of the pandemic- not only the everyday life of people, both infected and non-infected, but also resulted in disturbance in the global economy and the physical social interactions (Mishra et al., 2020; Aristodemou et al., 2021).

With the aim of maintaining the sustainability and health, regulating the economic difficulties and supporting societies, governmental authorities and health care professionals were required to adamant action (Bhattacharya et al., 2021). Aristodemou et al. (2021) mentions that the governments of the Member States of the EU were compelled to apply serious measures, so as to limit the transmission of the virulent disease and avoid the overload of hospitalized citizens in the medical institutions. Dokov, et al. (2020) shares that at one point in time, the authorities were forced to choose whether saving the economy was more important than saving people and vice versa. The economic, social and financial

implications were reevaluated on many levels, such as governmental, national and private sectors, as a result of the emergence of the pandemic (Bhattacharya et al., 2021).

2.2.1 Healthcare impact

Tisdell (2020) claims that the health of people is indisputably affected by any infectious disease. The demand for healthcare providers was drastically increased by the outbreak of COVID-19 and the aggressive increase of infected citizens (Aristodemou et al., 2021). Lal et al. (2020) states that the pandemic has driven the health systems close to the edge of failure, bringing to light some major cracks in the health structures and governance, even in countries, which claimed to be prepared. Infections of medical personnel led to some gaps, such as lack of healthcare employees, causing the overload and inability of health institutions to operate effectively (Aristodemou et al., 2021). Begg (2020) mentions that the supply of vital equipment for the medical staff during the pandemic, such as gloves, masks, goggles etc. were limited and it could result in a fatal end, by putting many in danger.

2.2.2 Socioeconomic impact

Any epidemic results in seriously disturbing the strength of the social and economic systems, displaying the lack of resilience and unpreparedness to upcoming challenges (Tisdell, 2020; Ibn-Mohammed et al., 2020). Moreover, the instability of the global supply and manufacture chains and vulnerability of global economies were highlighted by the coronavirus pandemic (Ibn-Mohammed et al., 2020). Hitting Europe in the first quarter of 2020, the International Monetary Fund (IMF) evaluated the upcoming negative economic impacts as more severe than the ones from the Great Depression of the 1930s (Ladi & Tsarouhas, 2020). Eruptions like these, uncover the vulnerability of the global economy and

the inability of corporations and healthcare systems to function unproblematically (Ibn-Mohammed et al., 2020). The global safety and efficiency of the world structure was questioned, once the government authorities and other institutions displayed insecurity and weakness (Dokov et al., 2020). Moreover, the pandemic has raised questions, related to the efficiency of the socioeconomic systems, which has led to a pressured demand for transformation and development (Dokov et al., 2020).

A colossal short-term economic disturbance was reported, due to the escalation of the disease, describing a deeper recession than the World War II, compared by Aristodemou et al. (2021). The decrease in supply of essential goods, drop in domestic and foreign trade and income deficit in the international market, were only a few of the impacts on the economic systems worldwide (Mishra et al., 2020). Ibn-Mohammed et al. (2020) highlights that not only the developing countries with low and middle income suffered the economic challenges of the pandemic, but also the developed ones, standing on the top of the international manufacturing and supply chains. The reliance between the domestic and foreign economies was crucial during the global crisis (Aristodemou et al., 2021). FFP2 is a type of filtering mask, used for protection from viruses, which was one of the few goods that were extremely needed, thus, private, cargo and passenger planes were used to transport these goods faster, than the regular intermodal containers (Ibn-Mohammed et al., 2020).

All Member States of the European Union are foreseen to meet unfavorable socioeconomic outcomes, despite countries like Sweden and Luxembourg, which have a vast amount of financial reserve to deal with the socioeconomic impacts of the crisis (Aristodemou et al., 2021).

With the goal to protect the health of citizens, each country has regulated preventive measures, where some countries performed better than others, due to the differences in well-being and standards of living (Aristodemou et al., 2021; Bhattacharya et al., 2021). However, the preventive measures of the coronavirus disease led to severe socioeconomic consequences worldwide, including closed borders (inability for imports and exports of goods, travelling), quarantine of citizens, closed workplaces, schools and restaurants, cancellation of any type of social events etc. (Ibn-Mohammed et al., 2020). The main economic impacts, derived from the pandemic and the preventive measures, include decline in Gross Domestic Product (GDP), drop in wages, budget deficit, increase in unemployment, as well as disparity between the supply and demand of goods (Aristodemou et al., 2021; Ibn-Mohammed et al., 2020).

Socializing and physical face-to-face contact was highly limited or in many cases impossible, due to the social distancing measures to constrain the virus from expanding (Mućk & Hagemejer, 2019). Emotional and mental impacts were registered among people, due to the lack of physical social contact, job loss, liability etc. (Bhattacharya et al., 2021). Moreover, panic buying of vital goods was a major result of the lockdown and uncertainty of the situation, whether there would be enough resources to sustain the normal life and well-being of the citizens (Ibn-Mohammed et al., 2020; Bhattacharya et al., 2021).

Ladi and Tsarouhas (2020), as well as Ibn-Mohammed et al. (2020), compare the COVID-19 crisis to the previous EU economic emergencies, such as the Euro area crisis, and pandemics that have occurred in the last century, such as HIV/AIDS and the Spanish flu, stating the COVID-19 pandemic could result in much higher and uncertain destruction of

the global economy. Compared to previous pandemics, the COVID-19 pandemic affects everyone, all over the world, which from a socioeconomic perspective highly disturbs the supply chain, as a result of globalization, development of technologies and boost in medical science (Ibn-Mohammed et al., 2020).

Mućk and Hagemejer (2019) have reported that trades and exports have a dominant role in growth of economy. Thus, the recovery expectations from the COVID-19 pandemic point to be a gradual process (Tisdell, 2020). Ibn-Mohammed et al. (2020) reports that the socioeconomic consequences of the pandemic would not disappear soon.

2.2.3 Sustainable Development Goals

The conception of sustainable development has appeared back in the 80s, with the supporting objectives of economic growth, protection of natural resources and climate (Hák, 2016). Sustainable development is a priority since more than a decade and its implementation will be an ongoing process for many more to come (Omann & Spangenberg, 2002). Social, environmental and economic systems are vital components of an efficient sustainable development, in a relation with high quality of life (Omann & Spangenberg, 2002).

The United Nations is an international association, in which 193 countries participate and it is developed to promote peace between the nations, fight together different challenges along the way, such as poverty, hunger, climate changes etc. (United Nations, n.d.). Therefore, back in 2015, the United Nations have designed seventeen Sustainable Development Goals (SDGs) and 169 targets, with the goal in the next 15 years to advance the well-being of people, quality of life and protect the biodiversity in every aspect, aiming to achieve sustainable development

on an international level (United Nations, 2021). Some of the main objectives include constant economic improvement and globalization (United Nations, 2021). Not only has the COVID-19 pandemic significantly hindered the accomplishment of these objectives but has moreover highlighted the vulnerability of the SDGs (Ibn-Mohammed et al., 2020). Unfortunately, some of the main goals would not be reached by 2030, or could even be replaced or removed, due to having an opposite effect of the desired one (Ibn-Mohammed et al., 2020).

2.3 The packages, plans and strategies of the European Union/ pre- COVID-19

The UN and the EU are in partnership since 2003 (Biscop et al., 2005). Ten years before the joint, in the Netherlands, the European Union was created. Adding the last country in 2013, Croatia, the EU marked the creation of one of the strongest unions worldwide. All countries of the European Union are part of the United Nations. Having 28 Member States in 2020, the United Kingdom announced Brexit and exited the Union the same year. Developing sustainability, social equality and integrity, peace and freedom, encouraging well- being of the citizens and being economically united with having the same currency, the fundamental aims of the European Union have been set (Citizens Information, 2020).

The European Commission is the main contributor in developing different strategies, policies, plans and facilities, by setting budgets, in order to benefit and support the Member States on a regional level (EC, 2020b). As reported by the European Commission (2020a), all Member States of the European Union faced the challenges the coronavirus pandemic has brought up, however, some experienced higher consequences compared to others. The outbreak of the virus inevitably

turned not only into a health problem, but an economic crisis for the Union (Ladi & Tsarouhas, 2020).

In order to evaluate the changes in priorities the European Commission made, due to the outbreak of the coronavirus pandemic, a background of previous strategies would be revised.

2.3.1 6 Commission priorities for 2019-2024

In figure 2 the main priorities for the period 2019-2024, the European Commission has defined for the Member States of the European Union, are represented and further discussion will follow.

Figure 2.
(Von der Leyen, 2019; Author's illustration)

The first objective from the ambitious package is called the *"European Green Deal"*, where the central pillar is climate action (Von der Leyen, 2019). The priorities are reducing carbon emissions, protecting biodiversity, industry, cultivation, by improving the standards of food, quality of air and the condition of water (Von der Leyen, 2019, European Commission n.d.-a). Moreover, uniting regions, local societies, industries and faculties, defending and developing rural areas, are also important aspects of the European Green Deal (Von der Leyen, 2019). Lastly, this pillar has the goal of advancing the well-being of citizens, by achieving zero-pollution, circular economy and sustainability, which enables the

innovations, job opportunities and allows industries to be competitive on the global market (Von der Leyen, 2019).

The second pillar of the 6 Commission priorities for 2019-2024, is *"An economy that works for people"*, where the centerpiece is a social market economy, which reduces poverty and inequalities and allows social fairness and well-being (European Commission, n.d.-b). The toughness of the European economy comes from small and medium-sized enterprises (SMEs), and the aim is to strengthen and develop them additionally (Von der Leyen, 2019). The Monetary Union is a fact; however, the role of the currency (Euro) among most Member States needs to become stronger (EC, n.d.-b). Social rights, equality, fight against violence, as well as objective taxation, are also important aspects of this pillar of the Commissions priorities (Von der Leyen, 2019).

The lifestyle of people, the way they communicate and work, has been drastically changed by the development of technologies and artificial intelligence. Therefore, another part of the ambition for 2019-2024 is called *"A Europe fit for digital age"* and the main priorities it outlines are upgrading AI, advancing the digital skills of people, developing telecommunication infrastructures in "white areas"- places with no active internet connection and establishing fifth generation technology (5G) (Von der Leyen, 2019; European Commission, n.d.-c). 5G is of a great importance for digital transformation, due to the higher energy efficiency, reducing greenhouse gasses, advancing production and function of enterprises and upgrading connectivity (England, 2021).

"Protecting the European way of life"- another priority of the program, has the objectives of securing the well-being of citizens, by fighting for justice and defending the values of the European Union (Von der Leyen, 2019). Moreover, national security, secure borders and social integrity

are some of the goals the European Commission is striving for (EC, n.d.-d).

In order to attract businesses outside the Union, a lawful, powerful and open trade should be promoted by the EU, as well as building up the image of Europe as an international leader, by enhancing climate, ecological and industry protection (Von der Leyen, 2019). These are the ambitions of *"A stronger Europe in the world"*, thus, invigorating the partnerships with neighboring countries (European Commission, n.d.-e).

The last segment from the Commission's ambition for the period 2019-2024 is called *"A new push for European democracy"*, obtaining the following objectives: strengthening the democracy, in addition to the connection between the European Commission and European Parliament, more attention to the voice of Europeans and strong defense of the Union from external intrusion (Von der Leyen, 2019; EC, n.d.-f).

2.3.2 Annual Sustainable Growth Strategy 2020

The Annual Sustainable Growth Strategy (ASGS) is an annually planned package, designed to outline the main socioeconomic priorities and goals for the upcoming period of twelve to eighteen months, thus launches the upcoming European Semester cycle (European Commission, n.d.-g).

The ASGS 2020 is planned the year before, which is interesting to be analyzed and compared to the ASGS 2021, whether the appearance of the coronavirus has modified the priorities of the European Commission or has not.

The European Commission is aiming to accomplish sustainable welfare of the citizens of the Member States; therefore, four elements have been

connected, and namely “environmental sustainability, productivity gains, macro-economic stability, fairness” (European Commission, 2019). These priorities are also part of the 6 Commission Priorities, both explicitly and implicitly stated. Moreover, the SDGs, established by the UN, are also part of the EUs priorities, and in order to complete them, a sustainable economy must be achieved (SDG Knowledge Hub, 2019).

Beginning with the first pillar, the addressed points are related to climate and environmental challenges, energy and architecture efficiency, manufacturing and nonmanufacturing industries (SDG Knowledge Hub, 2019). From a financial perspective, green and digital financing (twin transition) is prioritized, and the InvestEU Programme (long-term budget) will subsidize climate more than ever (European Commission, 2019). Further, productivity gain is related to income and job growth, digital technologies and innovations (SDG Knowledge Hub, 2019), which should advance the establishment of new products, services and enterprise models, and will be funded by public and private financing (EC, 2019). Education and skills improvement is essential for achieving higher productivity, knowing that productivity growth in the European Union is insufficient compared other international competitors (EC, 2019). According to Jolles and Meyermans (2018), the source of economic resilience in the EU is the European Union Single Market, as it provides chances for job creation, growth promotion and trade expansion. Employees deserve decent and equal working conditions, thus, working towards gratification of social rights is a priority, having the risk implied by the increased social stratifications (European Commission, 2019). Lastly, in the last pillar of the ASGS 2020, climate neutrality and entirely digital economy are priorities, in order to achieve macro-economic stability, where carbon neutrality is a target, the Union aims to achieve by 2050 (EC, 2019). Sustainable growth, solidarity

economy and fulfilling the Sustainable Development Goals are also vital targets of the last pillar (SDG Knowledge Hub, 2019).

2.4 The packages, plans and strategies of the European Union/ post- COVID-19

All European Institutions have come together with the aim to develop different strategies and in accordance, design instruments, facilities and establish budgets to support the governments of each Member State (Ladi & Tsarouhas, 2020; European Commission, 2020b). The role of the European Commission is to coordinate a counter response to the generated EU crisis, by developing a comprehensive strategy and political guidance of the Union, which would contribute to achieving the goal of sustaining public health and reducing the negative socioeconomic impacts on the EU Member States (EC, 2020a). The outlined priorities include actions to stop the virus from spreading, assuring the supply of medical tools, supporting the healthcare systems, helping businesses and the overall economy to preserve (EC, 2020a).

The European Parliament and Council of the European Union govern the Union's budget and funding, proposed in various policies and strategies by the Commission (EC, 2020b). They are designed in accordance with benefiting each stakeholder of the EU- individuals, private businesses, industries etc. (EC, 2020b).

The following sections have the aim to explore and discuss the most recent EU strategies, facilities and budgets, after the outbreak of the related coronavirus disease.

2.4.1 NextGenerationEU

In the middle of July 2020, the European Council have concluded the decisions for the upcoming long-term budget and more importantly a recovery instrument to tackle the COVID-19 pandemic, for the period 2021-2027 (KPMG, 2020; European Council, 2020). For the first time in history, an amount of €1.8 trillion will be assimilated by the European Union, with the aim of overcoming the COVID-19 consequences and create a more resilient environment (European Commission, n.d.-h). Beginning with the first package of the recovery plan, the temporary package, NextGenerationEU, where explicitly stated, a total of €750 billion, from which €390 billion in grants and €360 in loans, has the priority to bring back the Union on the right track towards a sustainable and resilient recovery, job creation, the twin transition (green and digital), and mitigate the damages the coronavirus pandemic caused (European Council, 2020). The NGEU budget allocation and main pillars are presented in Table 1.

NextGenerationEU	In billion Euro	Pillars
Recovery and Resilience Facility	672.5	Cohesion, resilience and values
ReactEU	47.5	Cohesion, resilience and values
Just Transition Fund	10	Natural resources and environment
Rural Development	7.5	Natural resources and environment
InvestEU	5.6	Single market, Innovation and digital
Horizon Europe	5	Single market, Innovation and digital
RescEU	1.9	Cohesion, resilience and values
Total	**750**	

Table 1.
(European Council, 2020, KPMG, 2020; Author's illustration)

All individual instruments are created to assist the Member States recover from the pandemic and furthermore, implicitly stated they follow the Annual Sustainable Growth Strategy for 2020 (European Council, 2020). However, around 90% of the temporary instrument's budget has been assigned to the Recovery and Resilience Facility (RRF), the heart of the temporary instrument, where explicitly stated, around 54% are in loans (€360 billion) and the rest (€312.5 billion) in grants (European Council, 2020). The Facility is created not only to help the Member States defeat the COVID-19 crisis and the socioeconomic damages it caused, but moreover support the Member States into becoming more resilient

and prepared to possible upcoming threats (European Commission, n.d.-h). The RRF will be further discussed in section 2.4.2.

A multiannual financial framework (MFF) is set every seven years, determining the amount the EU can spend over this period on various plans and strategies and it is developed to follow the European Union's expenses and exercise control over the budget allocations (EU Affairs, 2020; EU2020.de, 2020). Moreover, it is designed to be in assistance of individuals, businesses, regions, and institutions (EU Affairs, 2020). The new Multiannual Financial Framework for the period 2021-2027 adopts the largest amount of €1,074.3 billion, determined to bolster the recovery process (European Council, 2020). The main objectives include growth promotion, innovation and social coherence, industry, agriculture, border defense, migration, reduction of climate fluctuations etc. (EU2020.de, 2020; Rodríguez, n.d.). Table 2 represents the pillars of the MFF 2021-2027 and the budget allocation in various sectors.

Table 2.
(European Council, 2020; Author's illustration)

Pillars of the Multiannual Financial Framework 2021-2027	In billion Euro
Cohesion, Resilience and Values	377.8
Natural Resources and Environment	356.4
Single Market, Innovation and Digital	132.8
Neighbourhood and the World	98.4
European Public Administration	73.1
Migration and Border Management	22.7
Security and Defence	13.2
Total	**1 074.3**

Some pillars coincide with the ones from the NextGenerationEU but will be individually funded through different programs. According to the European Council (2020), the COVID-19 assistance package is developed to prioritize the European Green Deal, digital transformation and resilience.

2.4.2 The Recovery and Resilience Facility

As stated by Rodríguez (n.d.), the Annual Sustainable Growth Strategy for 2021 was designed to be fully compatible with the one prior, having the same four elements ("environmental sustainability, productivity, fairness and macroeconomic stability"), constructing the base for the twin transition and sustainable recovery.

The ASGS21 was developed in September 2020 (Ceep, 2020), which is after the release of the long-range budget and the recovery instrument NextGenerationEU. The centerpiece of the ASGS2021 is the Recovery

and Resilience Facility, with the extraordinary €672.5 billion, intended for the jump start of the economy, post crisis (European Commission, 2020c). The remaining four dimensions of the ASGS2020 will guide and set the ambitions for the recovery of the Member States and furthermore, strengthen their economic and social resilience (Rodríguez, n.d.). If no adequate action is undertaken, the socioeconomic systems will suffer a long-term damage, with no outlook towards recovery (European Commission, 2020c).

The RRF has the objective, in line with the European Green Deal, outlined in the previous ASGS, to help mitigate the COVID-19 consequences, and moreover, accomplish competitive sustainability and resilience, which demands an open and stable Single Market (EC, 2020c). Moreover, a successful execution of the RRF can be achieved with the contribution of private stakeholders (EC, 2021a).

Each Member State should develop and individual plan, aligned with specific recommendations accepted by the European Council (EC, 2020d). Moreover, each plan should include the four leading objectives, defined by the Annual Sustainable Growth Strategy 2021, in addition to the challenges the Member States have experienced concerning the twin transition (EC, 2020d; EC, 2020e). According to European Commission (2021a), the MS may send a draft of their National Recovery and Resilience Plan by October and submit their official plans latest by April 30th.

Europe has the potential to become a leader in green and digital transformation, as long as the path of sustainable and inclusive economy is followed, in accordance with the United Nations SDGs (EC, 2020c).

The Facility has the aim to organize the economies and societies of the Member States to be more well-prepared and resilient to future shocks or disruptions (European Commission, 2021a). However, it is of an important to acknowledge that in some parts of the European Union the socioeconomic and territorial cohesion is disturbed by the disparity in resilience; thus, cohesion and convergence should be encouraged (EC, 2020c). The COVID-19 pandemic has highlighted various flaws in some essential supply chains, and therefore the RRF will address the logistics chains, which were most affected during the crisis (EC, 2021a).

The first objective, underpinned by the Recovery and Resilience Facility, is the green transition (EC, 2020c; EC, 2021a). The economic comeback of the crisis is given a great opportunity to implement the objectives of the green transition (EC, 2020c). In the Annual Sustainable Growth Strategy 2020, the European Green Deal is described as a development strategy, aiming to reconstruct the European Union into a fair and thriving society, as well as competitive economy, and will also contribute to the RRF (EC, 2020c). The green transition associated with improvements in climate and environment, in order to achieve the goal set for 2050, scilicet “climate neutrality” and increase the quality of life of citizens (EC, 2021a). Moreover, it sets an opportunity for modern industries to strive for innovative technologies and digital infrastructures, which will highly contribute to the sustainability and resilience of Europe (European Commission, 2020c). It can be seen that the green transition is a superiority, therefore the European Commission (2021a) explicitly demands at least 37% of the total budget of each country’s national plan to be allocated for this objective.

The second pillar, part of the Recovery and Resilience Facility, is digital transformation, which as presented from the European Commission

(2020c) “is a key to strengthen the social and economic resilience of the EU and the Member States, their sustainable growth potential and job creation”. The pandemic has highlighted the importance of digital infrastructure, online learning and digitalized businesses and therefore, explicitly stated, an amount of at least 20% of the total budget of each Member State’s national plan must be allocated for this objective (EC, 2021a). Promoting the digital transformation of all socioeconomic sectors, along with public sectors, development of very high-capacity and 5G networks, as well as connectivity between rural and non-rural households are few of the elements, included in the target of digital transformation, aiming to reduce the digital divide (EC, 2020c). In order to assure that all citizens of the Member States can be engaged in society and make use of the digital transformation, the digital skills at all stages should be improved (EC, 2020c). Closing the digital gap among demographics and regions is a priority, consequently everyone should have equal access to digital skills, tools and infrastructure (EC, 2020c). Administrative procedures and online connection between individuals and enterprises have the potential to be improved, by digitally transforming the public administration (EC, 2021a). Other important aspects in the digital transformation are AI, (which according to the European Commission (2019) is driver for innovation), cybersecurity, protected connectivity, telecommunication infrastructure, and all these objectives are supported by the RRF (EC, 2020c).

As mentioned in section 2.3.2 green and digital transition are considered to be twin transition and alliance between them should be observed.

The lack of fairness in society in some cases, was spotlighted by the coronavirus pandemic, medical care, for instance, which is accessible by all citizens (EC, 2020c). The challenges obtain the fields of employment,

education, wellness, learning, as well as the groups that have been exposed the most (EC, 2021a). The pandemic has also highlighted the possibility of creating fair-minded and sustainable working environment and readjust business conditions in several areas (EC, 2020c). The prolonged period of restrictions, related to stores and restaurants, has drastically increased e-Services, where several large companies are dominant, and they harm the opportunities of SMEs to expand across the Single Market (EC, 2020c). It is necessary to ensure equal chances for all citizens and businesses (EC, 2020c).

After the financial and economic crisis of 2008, the European Economic and Monetary union became far more resilient to crises (Jolles & Meyermans, 2018). However, new challenges arose, because unlike the 2008 crisis, the pandemic has a direct negative impact on the macroeconomic stability, and it must be eliminated through decisive action (EC, 2020c).

The existing risk of imbalances worsens with the emergence of new ones, which requires encouragement of resilient recovery, as well as adjustments leading to increase in the resilience of economy and society (EC, 2020c). In a statement of the European Commission (2021a), the Recovery and Resilience Facility will provide the funds for supporting the Member States tackle these economic and social challenges. The coronavirus pandemic is putting a considerable pressure on the economic movement, with adverse effects on public and private liability (European Commission, 2020c).

To wrap up, the Recovery and Resilience Facility has the aim to help each Member State overcome the COVID-19 challenges, which are coordinated with the priorities of the European Union (in accordance with Annual Sustainable Growth Strategy 2020/2021), the 6 European

Commission priorities and the SDGs). The national plans, each Member State creates, should be striving to achieve economic growth, employment generation, resilient healthcare systems, socioeconomic resilience and territorial cohesion (EC, 2021a).

2.5 Digital objectives

As described in the Recovery and Resilience Facility, an amount of 20% of the individual plans must be assigned to digital objectives. Therefore, this section has the aim to analyze the terminology, related with the term "digital", data protection and main pillars of the plan "Europe's Digital Decade".

2.5.1 Terminology and background

The conceptual terms "digitization" and "digitalization" are often confused and used as substitutes, which is theoretically wrong (Brennen & Kreiss, 2016). The physical process of converting analog data to digital is digitization, and digitalization as the way the realm of society changes in accordance with digital communication and infrastructures (Brennen & Kreiss, 2016). Businesses use digitization, because it results in the productivity being more efficient and effective (Parviainen et al., 2017; Mergel et al., 2019). Digitization carries potential prosperity, such as expansion in productivity, innovation, adding higher value, better connection with consumers etc. and consequently complete enterprise models can be adjusted and transformed (Matt et.al, 2015).

According to Parviainen et al. (2017), the change in society and enterprises comes from digitalization, as a result of the adoption of advanced technologies. Digitalization goes hand in hand with economic development, cutting costs and risks, new job opportunities, higher living standards and improving the resident's accessibility to general services,

as well as assisting authorities and administrations to function more efficiently (Parviainen et al., 2017). Automation of routine tasks is beneficial for every employee and bring additional satisfaction and opportunity to develop extra skills (Parviainen et al., 2017). This technological application is a good example of digitalization, while digital transformation impacts entire organizations and their business activities, mechanisms, productions, methods and the way they provide their services, in accordance with digital technologies (Hapon, 2020). This transformation of advanced technologies gives multiple possibilities for accessing new markets, attracting new customers, creating new ways of delivering services and establishing new forms of connections (Mergel et al., 2019). Some particular sectors, finance and insurance for instance, espouse digital processes quicker than other areas, in order to boost their productivity and deliver more comfort to their customers (Friedrich et al., 2011). However, the high value, potentiality and positive effects of digitalization and digital transformation is often neglected by businesses (Parviainen et al., 2017).

2.5.2 Data protection

For all the processes of abovementioned, data is a key resource for their accomplishment and functioning. Sharing data between the countries is highly important for the global economy, individuals and enterprises (BSA, 2017). For businesses, data is vital, in order to attract new customers, improve marketing and limit costs (Grow, 2020). People need to have access to data and services everywhere when needed, thus the free movement of data is of an importance. The transfer of data (personal and nonpersonal) between webservers of countries is known as “cross-border data flows”. Handling large amounts of data, laws and regulations are highly required. The General Data Protection Regulation controls the

processing of person-related data within the European Union (GDPR EU, n.d.). Although it has been prepared and adopted by the EU it enforces responsibility to organizations, which either direct or collected data related to the citizens of the Member States. The Regulation has entered into force in 2018. GDPR will impose strict fines against those violating the established laws and regulations (GDPR EU, n.d.).

2.5.3 COVID-19 and digitalization

The pandemic has forced governments imply preventive measures, to contain the virus from spreading (Ibn-Mohammed et al., 2020), including lockdown periods, involving close down of all services and stores, except of the essential ones (Agostino et al., 2021).Thus, the pandemic has indisputably speeded up the digitalization process in numerous areas and has highlighted the importance of obtaining digital tools (Meiler, 2020; Agostino et al., 2021). Some of the sectors, which had to rapidly transform digitally, included businesses (remote working), public service delivery, education (remote teaching) etc. (Indriastuti & Fuad, 2020; Iivari et al., 2020; Agostino et al., 2021). Through digital technology, many businesses survived these lockdown periods, by being able to deliver their products or services remotely online (Meiler, 2020). As reported by the European Commission (2021b), digital tools were the main contributor to sustaining the socioeconomic life, as much as possible, throughout the COVID-19 crisis. Thus, digital technologies are proven to be a benefactor to resilience (Meiler, 2020).

It is undebatable that the coronavirus crisis resulted in many people changing their consumer behavior and interaction preferences to digital (Baig et al., 2020). Some companies have partly or fully transformed digitally, employees are doing their work distantly, without having the need to go to the office, and artificial intelligence (AI) has been

introduced in many enterprises (Baig et al., 2020). Moreover, SMEs have a great opportunity to digitally transform, introduce their businesses through digital advertising, enhance their product or service quality and adopt new digital skills, which will boost their sales, make them more competitive and help them attract new customers (Indriastuti & Fuad, 2020).

2.5.4 Europe's Digital Decade

The European Commission (2021b) has set an ambition strategy for the period 2021-2030, called "Europe's Digital Compass", including the following four dimensions: "skills, government, business and infrastructures" (European Commission, n.d.-i). These factors are essential for a successful shift to a resilient economy and society after the COVID-19 pandemic (EC, 2021b).

In more detail, the ambition includes having approximately twenty million information and communication technology specialists, with emphasis on women employees, in addition to at least eight tens of the population obtaining fundamental digital skills (EC, 2021b). Secondly, major public services should be able to deliver fully online, personal electronic health records should be accessible for every resident and at least eighty percent of them should be able to use a digital identity document (European Commission, n.d.-i). The third pillar is about digital transformation of the private sector and businesses, seventy five percent should be using cloud data and AI; at a minimum of ninety percent of the small and medium enterprises should have reached a fundamental level of adopting digital (EC, 2021b). Lastly, pillar four has the aim to provide digital connectivity for everyone, by developing telecommunication infrastructures with very high-capacity networks and fifth generation

mobile network (5G), as well as infrastructures related to computing and data development (European Commission, n.d.-i).

The European Union can become a global leader by approaching the digital transformation path and all of the objectives set in Europe's Digital Compass are feasible for all Member States, with the funding support from the Recovery and Resilience Facility and additional EU funding (EC, n.d.-i; EC, 2021b).

2.6 Bulgaria

The aim of this study is to explore how could the Recovery and Resilience Facility benefit the socioeconomic systems of Bulgaria. Therefore, the following sections have the aim to explore the country itself, how it is economically and digitally positioned among the other Member States of the European Union and the level of development. Moreover, the COVID-19 impact on the socioeconomic systems of the country would be discussed, which would lead to the analysis of the National Recovery and Resilience Plan of the country and the digital objectives described in the Plan.

2.6.1 Overview

Bulgaria, a country located on the Balkan Peninsula in Southeast Europe, is founded in 681 AD and is considered to be the oldest country in Europe, that has not changed the name since its formation (Angoloinfo Bulgaria, n.d.). The country obtains a strategic position, being in the middle of Europe and Asia (PWC, 2021a). From a historic perspective, Bulgaria used to be a kingdom, until 1946, when the country became a Republic (Nations online, n.d.) and in 1955 the country joined the association of the United Nations (United Nations, 2006). Until 1990, Bulgaria was dominated by communist type of leadership, and in that

time, few socioeconomic crises have been observed, however, a year later the country was striving to achieve democracy and market economy, which led to Bulgaria adopting a new constitution and becoming a parliamentary republic (Britannica, n.d.; Council of Ministers of the Republic Bulgaria, n.d.). In 2004, Bulgaria joined NATO and three years later, the country became part of the European Union (Nations online, n.d.). Despite the accession of Bulgaria in the EU, the country has not joined the euro area yet, but kept the local currency of Lev (BGN) and has not been yet accepted to the Schengen area (Schengen visa info, n.d.). However, in 2020, Bulgaria has been accepted to the ERM II, which is the European Union Exchange Mechanism, and has moreover entered the Banking Union and the waiting room for the eurozone (European Commission, 2020f; The World Bank, 2021b). The ERM is a series of procedures accustomed to control a county's currency exchange rate with respect to other currencies (Hayes, 2021). Bulgaria's entry in the ERM II is a step towards joining the Euro area, which is also a step closer to economic stability and development (EC, 2020f).

2.6.2 Level of development and digitalization of Bulgaria compared to the other Member States of the EU

Positive evolution, improvement, growth, in the context of economy, sociology, environment and demography, are all components of development (SID, 2021). Each country of the European Union has a different level of development, depending on the country's economic, social and environmental factors. The wellbeing of the citizens should be comprehensively analyzed, therefore, the Quality of Life index of Bulgaria would be addressed and compared to the other MS of the EU. There are few different indicators, which measure a country's development and performance- Gross Domestic Product (GDP), Gross National Income

(GNI) and Human Development Index (HDI). All of them would be compared as individual indices, and the most suitable ones would be selected as a measurement for development of Bulgaria and for comparison with the other MS. Moreover, digital performance is another important aspect of development, thus it is included in the development analysis. All of the measurements should present a broad overview of the socioeconomic development in Bulgaria, in addition to the level of digitalization in the country's socioeconomic systems.

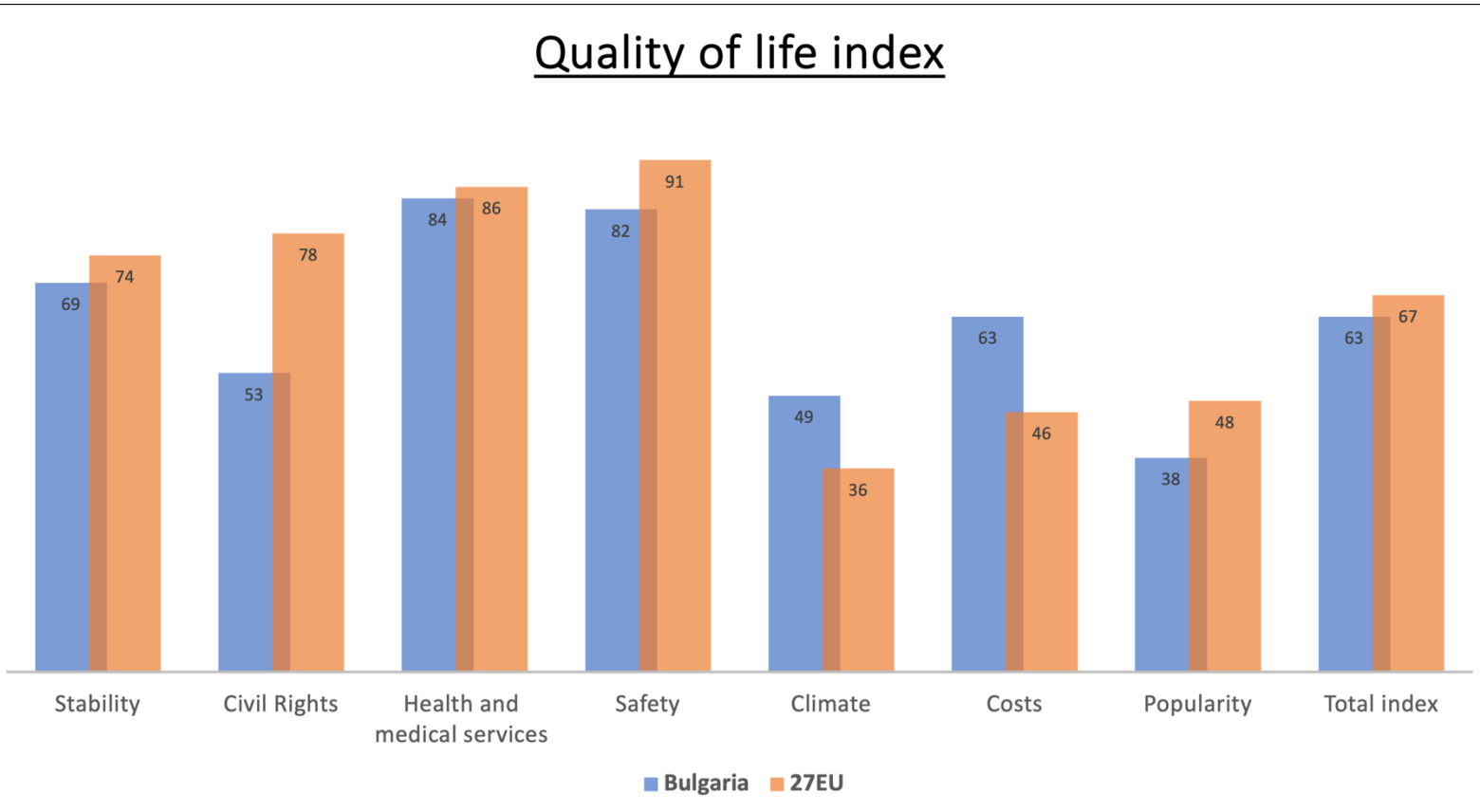
2.6.2.1 Quality of life

When discoursing about economic, environmental or sociological development, the concept of Quality of Life is significant to be included and discussed (Pinto et al., 2017). World Data Info (2020) provides information about the quality of life for 141 countries all over the world, gathering statistics from sources, such as CIA Factbook, OECD, The World Bank Group etc. A total of 36 elements contribute to the overall quality of life index, which are divided into 7 different categories (World Data Info, 2020). Figure 3 provides statistical information for the quality of life in Bulgaria, relative to the average of the other 27 EU countries. The World Data Info (2020) gives information for the latest available statistics, which are from 2020, however, when information related to

some of the segments was not yet available, the last accessible one was applied.

Figure 3.
(World Data Info, 2020; Author's calculations and illustration)

In figure 3, seven key areas, constructed from 36 factors, have been defined as essential components of the overall quality of life and the last column presents the total index of QoL (World Data Info, 2020). Each of the seven objectives has a different weight on the overall index of quality



of life- stability and civil rights are 17% of the total index, medical service and costs are 15%, climate is one percent less (14%), and with lowest contribution to the overall index are safety (12%) and popularity (10%) (World Data Info, 2020). The highest achievable score of the 7

components and the total index is 100 (World Data Info, 2020). The data for "stability" incorporates two key factors- economic and political stability and the objective for "popularity" indicates the willingness for migration to a certain country, because of its popularity (World Data Info, 2020).

Bulgaria ranks 41 out of 141 countries, which are included in the Word Data Info (2020). When comparing to the other EU Member States, it can be seen that Bulgaria has a relatively good performance. The quality of life index of Bulgaria is 63, with an average of 67 for the 27 EU Member States. The legal system and "civil rights" are a key area, where Bulgaria performs well below average, which is a significant contributor to the overall QoL index (World Data Info, 2020). However, "climate" and "costs" are the two subject areas, where Bulgaria performs well above the 27 EU average. In the "costs" segment domestic costs of living, annual earnings and taxes are included (World Data Info, 2020). A reason for the good performance in the "costs" section could be the fact, that Bulgaria has a flat tax rate of 10% and relatively low costs of living (PWC, 2021b; Montiglio, n.d.). In comparison with other Member States, (Latvia, Romania, Slovakia, Lithuania, Hungary and Ireland) they rank after Bulgaria and either have a lower, or equal total index for quality of life (World Data Info, 2020).

2.6.2.2 GNI versus GDP (theoretical analysis)

Gross Domestic Product and Gross National Income are two of the most commonly used indices for measurement of development. On the one hand, GDP denotes the amount of goods and services, that a nation has produced for a one year period, and on the other hand, GNI measurement includes GDP, in addition to the amount of income the country has generated over the year, not only in the country, but foreign

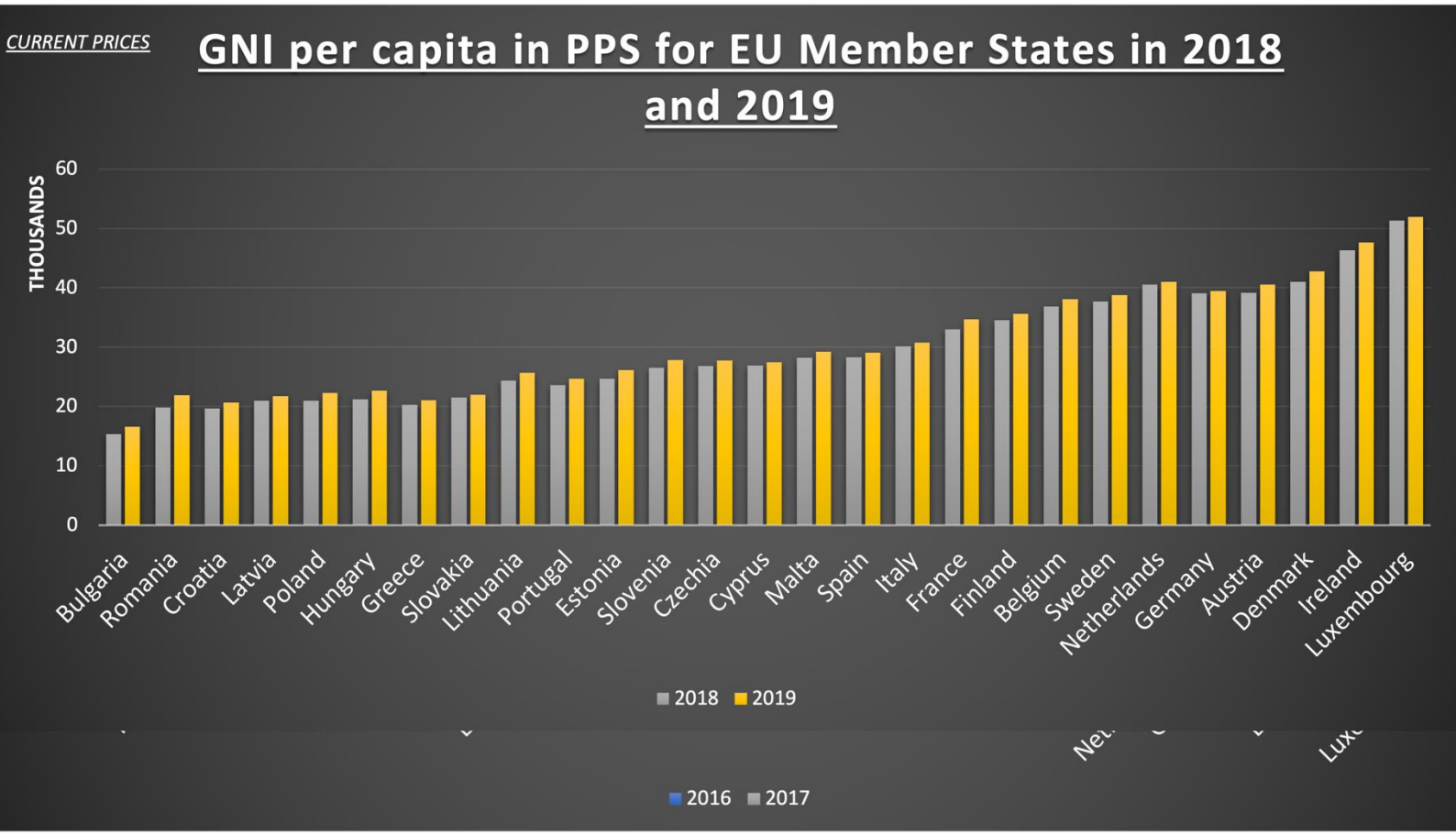
investments as well (Amadeo, 2020; Investopedia staff, 2021). “Per capita” is a term, frequently used when talking about GDP and GNI, and the meaning is “average per person” (Banton, 2020). For instance, GNI per capita is an evaluation of income, generated by one citizen for a period of one year (Amadeo, 2020). Another term, often used when comparing the economic performance of countries, is the Purchasing Power Standard (PPS), which is a common currency used in the EU, modified for different price levels, in order to most accurately compare the economic performance of each country (Eurostat, 2014).

2.6.2.3 GNI per capita and HDI

In order to evaluate Bulgaria’s performance and compare it to the other Member States of the European Union, two measures for social and economic development have been selected. The first one is GNI per capita in PPS, for the purpose of estimating the economic performance of the country, and secondly, HDI, which as mentioned, incorporates not only GNI per capita, but quality of life indicators.

Figure 4 and Figure 5 visually represent the GNI per capita in PPS of all 27 Member States (excluding United Kingdom, which since 2020 is no longer a Member of the European Union). Figure 4 presents the period of 2016-2017 and figure 5- 2018-2019.

Figure 4.



(Eurostat, 2020; Author's illustration)

In Figure 4 it can be viewed that most Member States tend to increase their GNI per capita between 2016 and 2017. However, Bulgaria clearly has the lowest gross national income per capita in comparison with the other 26 Member States. The GNI per capita of Bulgaria for 2016 is almost 14 thousand in purchasing power standard, and more than 14,600 for 2017, which is half as Italy's GNI per capita for the year, and more than three times less then Luxembourg's, which has the highest GNI per capita for 2016 and 2017.

Figure 5.
(Eurostat, 2020; Author's illustration)

Compared to Figure 4 and the years of 2016 and 2017, the situation in figure 5 and the years of 2018 and 2019, is similar. However, it can be seen, that all Member States report increase in the gross national income per capita. Although, Bulgaria is the country with the lowest GNI per capita and reports GNI per capita twice as less compared to France and three times lower than Luxembourg in 2018 and 2019, Bulgaria has increased the gross national income per capita of the period of 2018-2019, with an increase of nearly 3 thousand from 2017 to 2019. Moreover, compared to Italy or Luxembourg, Bulgaria has a higher increase over the period represented in figure 4 and figure 5. Luxembourg has increased with less than 2 thousand, and Italy- slight above 2 thousand.

To obtain a better overview of a country's overall performance, HDI is also an important indicator of development, since it includes not only economic factors, but social ones as well (BBC, n.d.). The Human Development Index has been designed by the United Nations Development Program in the early 90s, with the mission to oust GDP as a measure of progress, since social aspects are not included in the gross domestic product indicator (Sherrieb et al., 2010). HDI is frequently used to measure development, since it not only includes economic growth, but quality of life, from which life expectancy and education, which makes it more accurate as a measure for development (Human Development Reports, n.d.). Figure 6 represents the dimensions, indicators and dimension indices, used to calculate the HDI for every country.

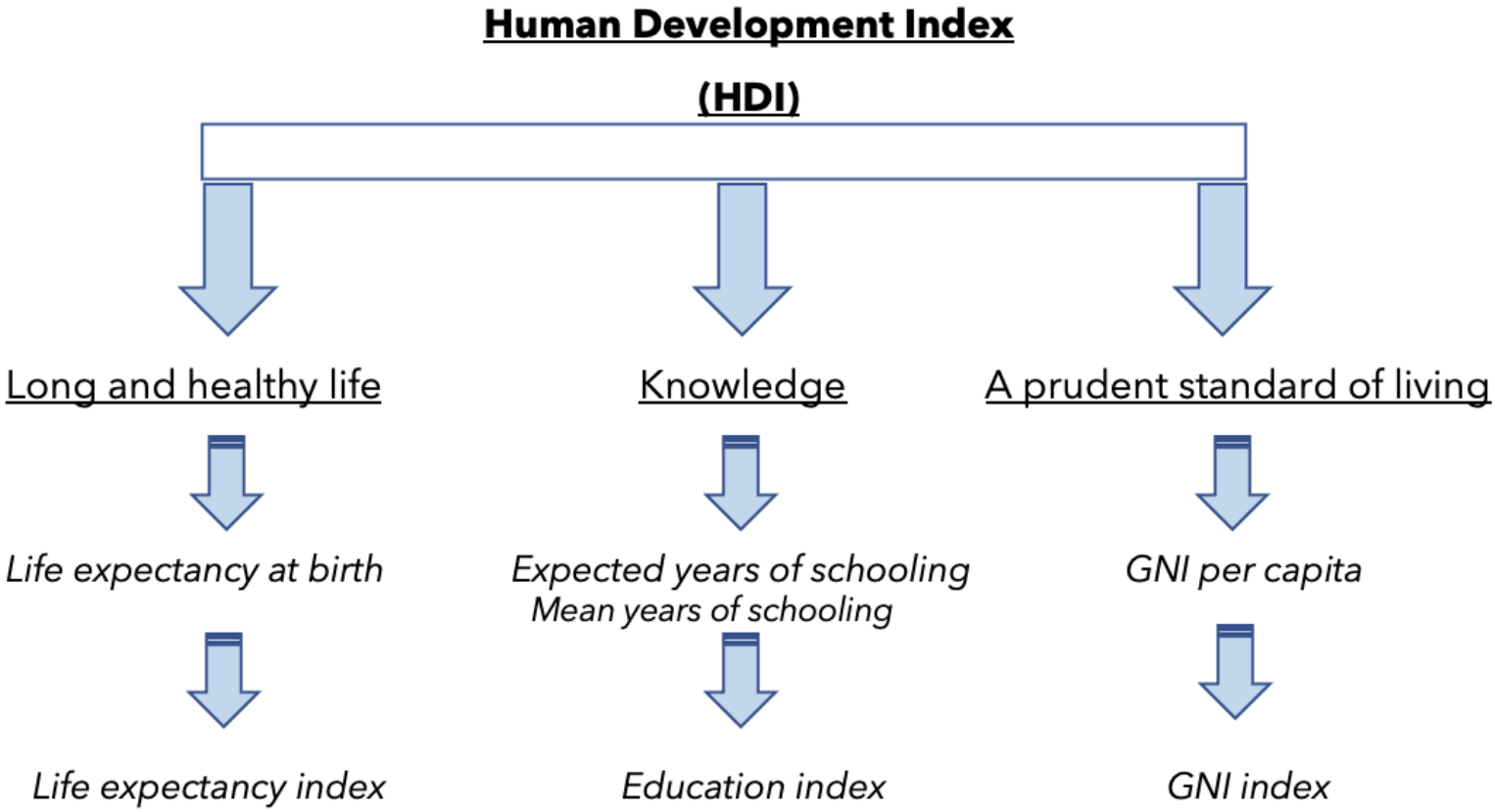


Figure 6.
(Human Developments Report, n.d.; Author's illustration)

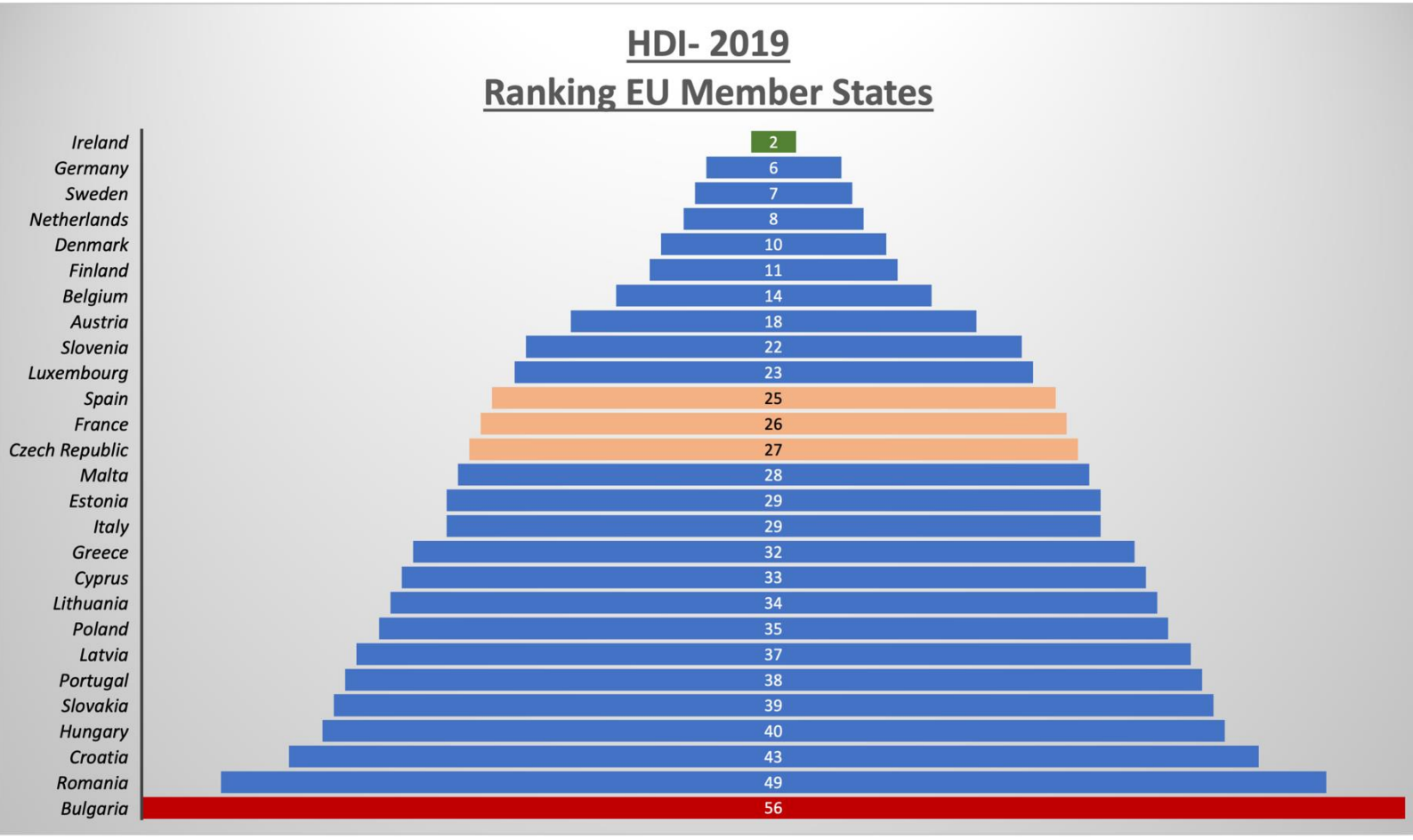
All of the objectives, included in the Human Development Report (n.d.)

SDG 3	SDG 4.3	SDG 4.4	SDG 8.5
life expectancy of birth	expected years of schooling	mean years of schooling	GNI per capita

are also in relation to some SDGs (UNDP, 2020):

Table 3.
(UNDP, 2020; Author's illustration)

The nations are ranked out of 189 countries that are included in the HDI



(Human Developments Reports Office, 2020). Figure 7 portrays only the 27 EU Member States.

Figure 7.
(Human Development Reports Office, 2020; Author's illustration)

It is important to acknowledge, that the HDI gives score between 0 and 1 for each country, with 1 being the highest possible (BBC, n.d.) Evidently, Bulgaria has and index of 0.816 and ranks 56th out of 189 countries. (Human Development Reports Office, 2020). According to

Low	Medium	High	Very high
less than 0.55	0.55-0.69	0.7-0.79	0.800 and 1.0

UNDP (2018), there are four types of classification for the values of the HDI:

Table 4.
(UNDP, 2018; Author's illustration)

In accordance, Bulgaria may have the lowest rank among the EU Member States but overall has very high index. The average index for the Member States is 0.900, which are reported by Spain, France and the Czech Republic (Human Development Reports Office, 2020). The highest index among the 27 EU Member States is scored by Ireland- 0.955 and ranks 2nd out of 189 countries worldwide (Human Development Reports Office, 2020).

To conclude, from both figure 4 and figure 5, despite Bulgaria being the country with the lowest GNI per capita in PPS, the country reports an increase annually, which growth is relatively higher than countries with greater GNI per capita. Figure 7 presents Bulgaria as the Member State with the lowest HDI, although the country scores a very high index. A reason for that could be the low GNI per capita. However, it can be concluded that Bulgaria has a potential for development, and according to Eurostat (2020), is steadily increasing its gross national income per capita, which will further improve the county's HDI.

2.6.3 Level of digitalization in Bulgaria

Digitalization is part of the main economy booster after the coronavirus pandemic and with horizontal economic impact over all sectors and

society (European Commission, 2021a). Digital Economy and Society Index (DESI) is a measurement accustomed to describe the digital progress of the Member States, related to economy and society

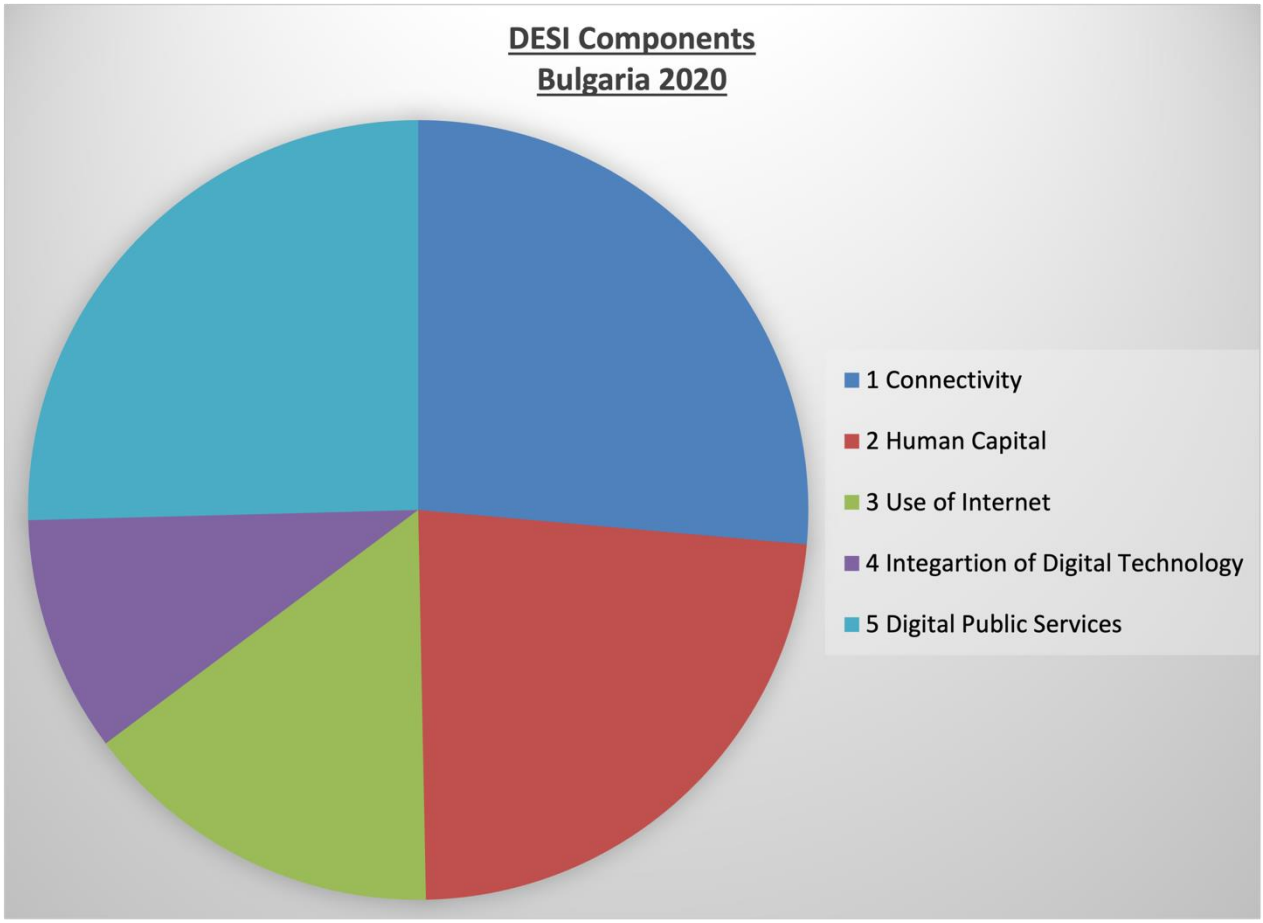
Dimension	Weight
1 Connectivity	25%
2 Human capital	25%
3 Use of internet services	15%
4 Integration of digital technology	20%
5 Digital public services	15%

(Stavytskyy et al., 2019). The DESI components, each of them having different weight to the overall index, are visually represented in table 5.

Table 5.
(European Commission, 2020g)

Connectivity and human capital have the greatest weight on the overall DESI, and moreover they obtain important subcomponents, such as broadband coverage and internet user competence (EC, 2020g). Furthermore, integration of digital technology is calculated as one-fifth of DESI, with subcomponents of business digitalization and e-commerce (EC, 2020g). With 15% of the overall index, are use of internet services

and digital public services, with subdimensions of internet usage, activities online and e-government (EC, 2020g).



According to the DESI 2020 report from the European Commission (2020h), Bulgaria ranks last out of 28th countries (including United Kingdom, because the 2020 report measures the 2019 performance). Bulgaria scores over 36, which is well below the average for the European Union- 52.6 (EC, 2020h). It is important to acknowledge that Bulgaria has increased the overall DESI score, but kept the last position from the previous year (EC, 2020h). Figure 8 is visually displaying the components, favourable for the Digital Economy and Society Index of Bulgaria from the 2020 report.

Figure 8.
(European Commission, 2020h; Author's calculation and illustration)

In Figure 8, it can be seen that digital public services, connectivity and human capital are the components, having better performance, compared to the other components and furthermore having greater weight for the overall DESI score of Bulgaria. In the report of the European Commission (2020h), the country shows good performance in connectivity, with respect to the widely available extremely fast broadband networks, as well as mobile ones.

Bulgaria has the potential to develop the Digital Economy and Society Index, and the COVID -19 pandemic has speed up the action towards achieving digital transformation and improvement of all digital objectives. Unfortunately, the coronavirus crisis and its consequences heavily impacted the development of the country in 2020. However, due to limitations of data for GNI per capita in PPS, HDI rankings and DESI for 2020, statistical analysis could not be represented. Therefore, the next section has the aim to provide theoretical analysis of the consequences from the COVID-19 crisis in Bulgaria.

2.6.4 Bulgaria and the COVID-19 impact on the socioeconomic systems

Bulgaria suffered no less than other countries and is an interesting case to be looked at, being not only part of the European Union, but also a Balkan country (BBC, 2018). On the one hand, the Eastern-European Member State is bounded with the neighboring Balkan countries on a social, economic and political level, and on the other hand has the support of the European Union and the Member States (Dokov et al., 2020).

Emerging Europe (2021) and Nordea (2021) report that the Bulgarian economy was functioning efficiently before the outbreak of the pandemic. Some of the features included the prosperous incorporation of Bulgarian manufacturing companies into global production networks, continual increase in wages and flat unemployment rates (Nordea, 2021).

Bulgaria has an open economy, set to export production, which was considered to be a vast accomplishment, and even though the public finance were carefully managed, the economy system of the country was undefended to disturbance (Dokov et al., 2020; Emerging Europe, 2021).

In a report from EBRD (2020), the negative effects on the economy of the Balkan country are described, claiming recession in 2020, with the goal to sustain jobs, help exposed groups and help companies avoid bankruptcy, by supporting them with the needed funding. Back in 2019, Bulgaria has reported a GDP growth of 3.7%, which in 2020 has dropped by 7.7% (EBRD, 2020 Nordea, 2021).

The negative impacts of the coronavirus pandemic cover all areas of the Bulgarian economy, with an emphasis on the tourism sector (Nordea, 2021). Bulgaria founded an internal crisis management board of experts in 2020, with the main task of monitoring the movement of the virus and establish preventive measures to limit the expand of the virus (Dokov et al., 2020). This was highly appropriate and demanded, given the vulnerability of the healthcare infrastructure in the particular Member State. Dokov et al. (2020) describes that the hardest months were the end of the months between the ending of the first quarter and beginning of the second of 2020, continuing with a tendency of slow recovery the upcoming months.

However, negative socioeconomic consequences were inevitably witnessed. Job losses, decline in minimal wage rate and bankruptcy in many businesses are just a few examples which led the poverty in Bulgaria to undeniably increase (The World Bank, 2021a; Nordea, 2021).

The negative socioeconomic impact, caused by the pandemic, includes the increase in the unemployment rate, rise in the income inequality (Nordea, 2021). The automotive industry in the country was steadily developing before the crisis, which, unfortunately, did not secure stability and as another consequence of the crisis, a drop in the sector's efficiency was witnessed (Dokov et al., 2020). Moreover, convergent regions, rural and sparsely populated areas in Bulgaria have undiversified economies, which will lead to difficulties with overcoming the socioeconomic crisis (Dokov et al., 2020).

Most importantly, the health of the Bulgarian citizens was even more endangered, when medical institutions announced the boom of medical staff getting infected and the existence of hospital beds deficit, specialized for patients with coronavirus (Rohova, 2020). The impoverished citizens have limited savings and less access to medical care, and there is also a higher chance that they experience income fall, due to the disbalance in the economic movement (The World Bank, 2021a).

The preventive measures, initiated to limit the spread of the coronavirus disease, were adequately operated in Bulgaria, however, different strategies in relation to reliving the socioeconomic consequences, derived from the implied measures, were prioritized at a certain point in time (Dokov et al., 2020). These actions (the preventive measures) inevitably harmed the economy worldwide, thus the Member States of the European Union have united powers to sustain their economies

(Aristodemou et al., 2021). Moreover, as analyzed in section 2.4.2, the European Commission has come up with a plan to support the economies of all Member States, with the aim of reducing the COVID-19 impact on the socioeconomic systems and develop the systems of the countries become more resilient to potential further shocks.

2.6.5 National Recovery and Resilience Plan

As mentioned in section 2.4.2, the Member States should have submitted their plans by April 30th. Three versions of the National Recovery and Resilience Plan of Bulgaria have been provided: from October 30th (Version 1.0), February 8th (Version 1.1) and April 16th (Version 1.2) (NextGenerationBG, 2021). However, no information is available, whether the last version is a draft or final plan. Therefore, the document, which will be analyzed, will be the latest available version.

The main objective of the Recovery and Resilience Facility is mitigating the negative socioeconomic impact, the COVID-19 crisis has caused. Through the path of achieving this goal, two main objectives are outlined- restoring the potential for economic development and furthermore develop and improve it. Simultaneously, the Plan sets the foundation for the twin transition (Green and Digital), as part of one of the 6 European Commission Priorities for 2019-2024- the European Green Deal.

The National Recovery and Resilience Plan of the Republic of Bulgaria is constructed on 4 pillars, each of them having 3 main objectives, which are represented in figure 9 (Council of Ministers of the Republic of Bulgaria, 2021).

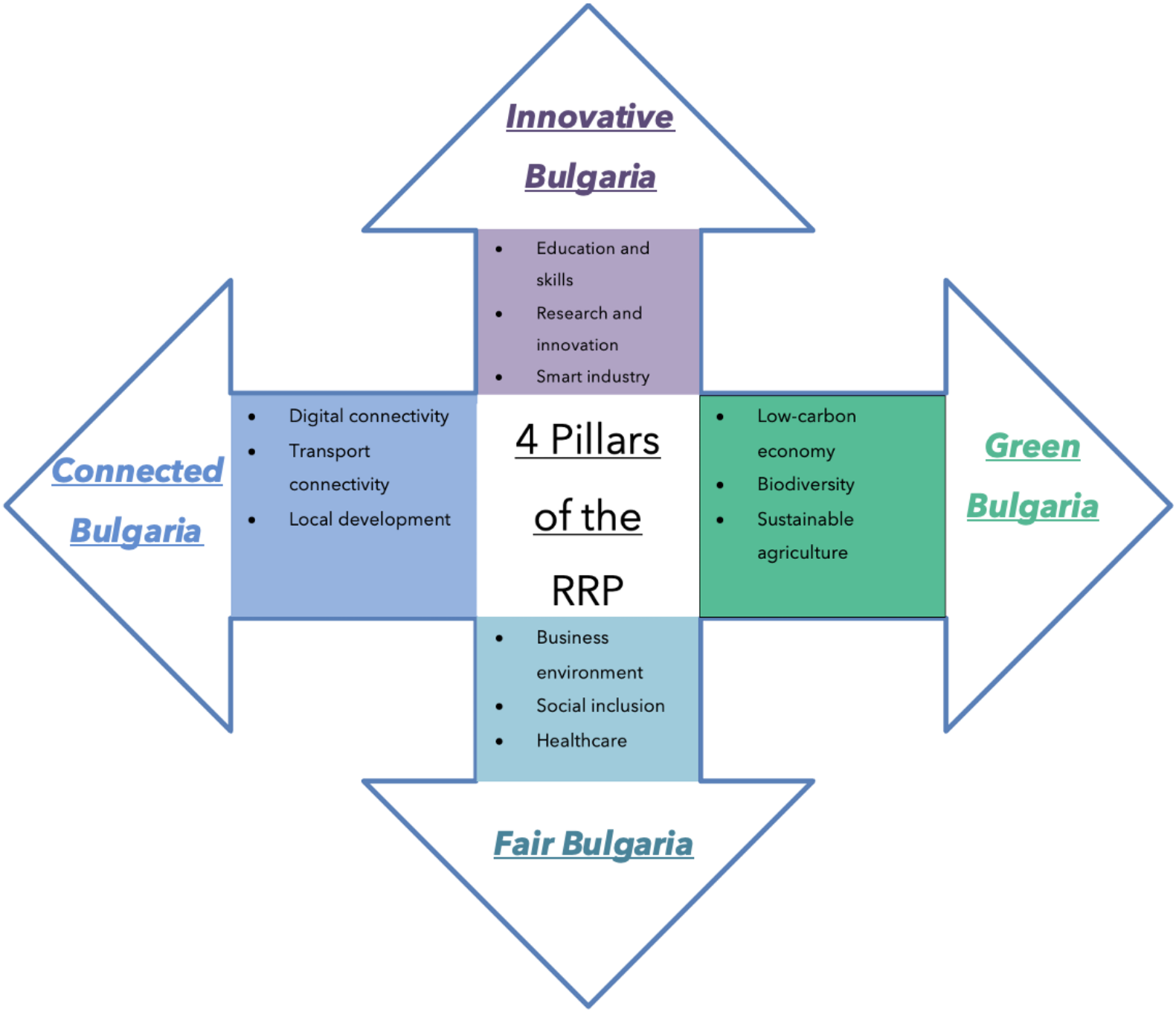

Innovative Bulgaria
Education and skills
Research and innovation
Smart industry
Connected Bulgaria
Digital connectivity
Transport connectivity
Local development
4 Pillars of the RRP
Low-carbon economy
Biodiversity
Sustainable agriculture
Green Bulgaria
Business environment
Social inclusion
Healthcare
Fair Bulgaria

Figure 9.
(Council of Ministers of the Republic of Bulgaria, 2021; Author's illustration)

The total budget for the implementation of the National Recovery and Resilience Plan of the Republic of Bulgaria amounts 6 450.6 million Euro (CMRB, 2021). The following sections aim to analyze the individual pillars, their components and how could they improve the socioeconomic systems of Bulgaria.

2.6.5.1 Innovative Bulgaria

According to the Council of Ministers of the Republic of Bulgaria (2021) the target of the first pillar "Innovative Bulgaria" is to advance the economy's competitiveness, with the objectives of an economy based on awareness, expertise, and smart expansion, where 26% of the total budget is allocated.

The first component of the pillar, "Education and skills" has few objectives. The aim of the policy is to increase the standard and scope of learning and training with an emphasis on the acquisition of analytical abilities and the development of creativeness, improving people's ability to opportune adjust to digital transformation and the corresponding changes in the workforce (CMRB, 2021). Moreover, the innovation and digitalization of educational methods and routines should be accelerated, in addition to enhancing the digital skills among the individuals in the workforce. These actions arose from the COVID-19 pandemic and the need for distant learning, and its implementation will support the resilience of the educational institutions (CMRB, 2021). The urgent conclusion is that the challenges of the crisis, together with structural problems, demographic trends and the growing skills gap related to digital and green transformation, including a weaker focus on adult

literacy and retraining measures, require higher and effective investment in the qualifications and skills of the current and future workforce in Bulgaria.

The second component of the pillar "Innovative Bulgaria" has the objective to establish a high-tech industrial foundation, in order to secure a favorable environment for the execution of new goods, processes and advancement of innovative businesses, which will highly advance the economy growth (CMRB, 2021). Furthermore, the education in scientific activity must be stimulated, in accordance with the overall advancement of the research base and ability to advance critical mass and skills to handle the twin transition. This component has the ability to grow into being a driver of the county's economic development for a long period of time, as well as expanding the competitiveness and economic resilience (CMRB, 2021). In addition, the planned interventions have a lasting impact, i.e., their effect will not disappear after the completion of the relevant measures. This component of pillar 1 has a specific focus on the green and digital transition, thus promoting the achievement of the respective national goals.

The last element of the first pillar from the National Recovery and Resilience Plan of the Republic of Bulgaria seeks to assist the industry in the twin transition and deliver a beneficial condition for the awareness of new investments (Council of Ministers of the Republic of Bulgaria, 2021). This has the capability to contribute to the productivity of the enterprises in the country and lead to accelerated economic growth, greater employment rates and incomes. Supporting SMEs explicitly in the digital and green transitions, decarbonization of the economy, attracting investments in the industry and therefore advancing the ecosystem of

the industry, are part of the main targets this component obtains, with regards to increasing economic recovery and resilience (CMRB, 2021).

2.6.5.2 Green Bulgaria

35.6% from the total RRP are allocated to the second pillar of the National Recovery and Resilience Plan of the Republic of Bulgaria, with the objectives of laying down the foundation for sustainable supervision of natural reserves, for the purpose of reacting to the economy and social demands, which will continue in the future (Council of Ministers of the Republic of Bulgaria, 2021).

The first component of pillar 2 has the aim to reduce the greenhouse gasses and energy inefficiency of the economy and promote the green transition by taking measures to eliminate energy waste and promote the production of energy from renewable sources. Furthermore, the modernization of the activities for organizing, managing and preserving the country's electricity transmission network will be of key importance (CMRB, 2021). The reforms and projects in this component have a direct contribution to the application of one of the flagships- “Scale-up”. Some of the potential positive impacts, this component can have, include employment in the carbon economy and enhancement in the life quality (QoL level) of current and future generations. The measures envisaged in the component will have a macroeconomic impact in the short term (CMRB, 2021).

The purpose of the second component from “Green Bulgaria” is to assure efficient governance of the National Ecological Network and to protect and stop the harm of biodiversity in the country, which will further

contribute to the decarbonization (CMRB, 2021). The protection of the biodiversity in Bulgaria will lead to boost in quality of life, livelihood of local residents, in addition to economic development. This component highly contributes to the green transition. The measures envisaged in the component will have an extremely modest macroeconomic impact, which stems in part from the amount of the anticipated funding but is also partly due to the capabilities of the tool used to assess the expected effects (CMRB, 2021).

The third component of pillar 2, according to the (Council of Ministers of the Republic of Bulgaria (2021), is related to sustainable agriculture, with the objectives of enhancing the sustainable water consumption and increase in the sector's competitiveness. Moreover, it will highly contribute to the improvement of the resilience of the economy, in regard to climate emergencies. Simultaneously, some investments anticipated for this component will be allocated to digital transformation for the agriculture sector (e-services) and will contribute to diminish the inequalities between the urban and rural areas, knowing the high level of reliance the population has on the agricultural sector (CMRB, 2021). The measures envisaged in the component is expected to have a macroeconomic impact in the short term.

2.6.5.3 Connected Bulgaria

The third pillar, "Connected Bulgaria", where 21.9% of the financing is assigned, is focused on providing prerequisites for advancing the competitive capacity and sustainable economic growth of the regions in Bulgaria, in particular the improvement of transport and digital connectivity, in addition to the promotion of local development (CMRB, 2021).

The first element of the third pillar, digital connectivity, has the potential to develop a contemporary and stable digital infrastructure and to defeat the disparity between various regions, linked to the distribution of broadband access. The investments can be implicit or explicit and the potential reforms have the goal to enhance financing in high-capacity digital infrastructure, for the purpose of providing access to services, enabled by broadband networks, equal to all citizens (CMRB, 2021). Furthermore, this will advance the opportunity of distant learning and working, contribute for reducing the social exclusion, establish e-Government and improve the function of public administration. 5G connectivity is also an element, important for digitalizing the Bulgarian economy and infrastructure (CMRB, 2021). The economic recovery can be supported in the mid-term by implementing the reforms of the component, while encouraging job creation and reinforcing economic and social resilience. Moreover, this component corresponds with one of the European Flagships, namely "Connect" and Bulgaria has the potential to exceed the ambition set by the European Commission, if delivers the objectives in the component successfully (CMRB, 2021).

"Transport connectivity" is the second element, outlined in the second pillar. The main objectives include reducing greenhouse gases, produced by the transport sector, which can be achieved through financing for developing a more modern and digitalized railway sector (CMRB, 2021). Green and digital transition, increment in security and national equality of growth can be assisted by implementing the elements from this component. The investments can be explicit or implicit and the given reforms seek to improve the resilience of the transport industry, through diminishing the greenhouse gases, and is essential for the achievement of successful green transition (CMRB, 2021). Transportation carries out its risks and therefore, the safety is also an

objective, which is important to be addressed, and will increase the sustainability and development of the sector. Improvement of population's mobility, thus supporting trade and exchange of goods between different areas, are part of the goals of this component and will promote economic growth (CMRB, 2021).

The last component of "Connected Bulgaria", as reported by the Council of Ministers of the Republic of Bulgaria (2021) has the aim to deliver prerequisites for raising competitiveness and sustainable development of Bulgaria's regions, along with encouraging local development. The suggested reforms look forward to delivering a more effective regional policy, thus addressing regional imbalances ,while contributing to the effective operation of public administration (CMRB, 2021). These measures will have a macroeconomic impact in the short term and will lead to social sustainability.

2.6.5.4 Fair Bulgaria

In the last pillar, where least percentage of the overall funding is planned to be allocated (16.5%), the main goals include a particular emphasis on underprivileged communities and individuals to accomplish an incorporating and sustainable development, in accordance with collective wellbeing for all (CMRB, 2021). Moreover, creating productive and reliable public institutions, conscientious with the business and social needs (CMRB, 2021).

"Business environment" is outlined as one of the three elements of the fourth pillar "Fair Bulgaria". The leading target is to efficiently bolster the possibility for sustainable development and advance the country's economic resilience, by tackling deterrent in the working conditions and upgrading the e-Governance (CMRB, 2021). However, their timely and

prosperous implementation is important for reinforcing the Bulgarian economy's competitiveness and advance its resilience. As stated by the Council of Ministers of the Republic of Bulgaria (2021), overcoming the difficulties of digital transition will be helped by the digital dimensions, and namely e-Justice, e-Government and digitalization of the construction industry. All reforms correspond with the Flagship "Modernize".

The second component of the fourth pillar aims to promote the social inclusion of disadvantaged groups and to increase the quality and scope of social services provided (CMRB, 2021). By improving the overall social support system aims to address the structural challenge of the ineffectiveness of social policy in terms of its targets of decreasing poverty and inequality. According to the Council of Ministers of the Republic of Bulgaria (2021), the execution of the proposed interventions and reforms planned in the objective will be of a great importance to overcome the COVID-19 consequences, related to social exclusion and furthermore increase the social resilience. In terms of strengthening social stability, the reforms will also promote the economic revival, given the enabled chances for individuals from some disadvantaged societies to enter the workforce (CMRB, 2021).

The last element from pillar 4 has set the target of increasing the healthcare system resilience, additionally to expanding the quality the citizens receive from the system (CMRB, 2021). Other reforms aim to tackle the issues, associated with the allocation of health personnel, modernization of equipment, adoption of new technologies for the medical care. However, as reported by the Council of Ministers of the Republic of Bulgaria (2021), all reforms have the objective to increase the social resilience.

2.6.6 Digital objectives, outlined in the National Recovery and Resilience Plan of the Republic of Bulgaria

The pandemic has highlighted the importance of digital infrastructure, online learning and digitalized businesses and therefore, explicitly stated, the European Commission has set an amount of at least 20% of the total budget of each Member State's individual plan to be allocated for this objective (European Commission, 2021a). This section aims to explore how and where Bulgaria has allocated the 20% assigned to digital.

As described in section 2.6.4, the National Recovery and Resilience Plan of the Republic of Bulgaria is divided into 4 components, each having 3 subcomponents. In the Plan, it is explicitly stated that 32% of the overall budget will be invested in digital objectives, and namely 2 062.7 million Euro (CMRB, 2021).In the National Plan of the country, all 12 subcomponents include targets and estimated budget, that will go for digital objectives, except for 1, which is "Biodiversity". However, as stated by the Council of Ministers of the Republic of Bulgaria (2021), this subcomponent indirectly contributes to the digital transformation, due to the integration of databases, despite of the component allocating 0% for digital objectives. Two components are fully dedicated to digital transition, namely "Digital connectivity" from pillar 3 and "Business environment" from pillar 4 (CMRB, 2021). Over 350 million Euro are planned to be allocated for "Large-scale deployment of digital infrastructure" from "Digital connectivity" and 283.3 million Euro for few objectives from "Business environment". The objectives include establishment of e-Justice, national electronic system for electronic identification in Bulgarian IDs, as well as advancing the quality of anti-corruption policies and others (CMRB, 2021). Other subcomponent, which has allocated over 488 million Euro for digital objectives is

"Education and skills". It aims to build the digital skills needed to overcome the digital transition difficulties (CMRB, 2021). This is particularly urgent given the country's serious backwardness compared to other EU Member States. The percentage of people with a rudimentary ability in the area of digital technologies is about 29% of the Bulgarian population of young adults (16 years old) to elderly (74 years old) , while the EU average is a bit less than sixty percent (CMRB, 2021). The third subcomponent from pillar 1 "Smart industry" allocates 43.8% (294.8 million Euro) for digital objectives (CMRB, 2021). Some of the objectives include technological transformation, digitalization, digital innovation hubs and cybersecurity. Nearly the same amount is allocated for "Transport connectivity" (283.3 million Euro/ 42.4%) for development and digitalization of Trans-European Transport Network (TEN-T) and expanding the subway in the capital of Bulgaria (CMRB, 2021). 37% of the subcomponent "Local development" from pillar 3, will be allocated for digital objectives- digitization of integrated water management. Furthermore, 88.9 million Euro from "Research and innovation" will be distributed for training digital skills. Moreover, part of this budget allocation will be assigned for higher quality environment for education, namely the relevant institutions will be modernized (CMRB, 2021). An overall of nearly 173 million Euro are planned for digital objectives from the subcomponents "Low-carbon economy", "Sustainable agriculture", "Social inclusion" and "Healthcare". The ambitions of these subcomponents, related to digital, include energy efficiency, digitalization of farm-to-table processes, sustainable and competitive ecosystem, digitalization of archives and libraries and others.

3 Methodology

The following section of this thesis has the purpose to present the Methodology. An overview of existing research designs, methods and worldviews would be discussed, with support of secondary data. Exploring them in more detail will be of use when explaining the methods, the researcher has chosen, in order to collect primary data. The goal of obtaining primary data is to gain further knowledge about the two developed research questions:

RQ1: *How would the Recovery and Resilience Facility improve the resilience of socioeconomic systems in Bulgaria?*

RQ2: *What is the expected impact of digitalization described in the RRF on the Bulgarian socioeconomic systems?*

3.1 Theoretical analysis of research approach and main components

Primary data is the type of information, which is collected directly by the researcher himself. Obtaining primary data is essential for a study, because it will assist the researcher with answering the research questions, provide reliable and accurate data, since it is collected firsthand. In order to collect primary data, a suitable research approach and method must be selected, depending on the field and aims of the particular study. Three different research approaches are developed- quantitative, qualitative and mixed methods research. Beginning with qualitative research method, it is an approach, designed to understand the importance individuals or organizations impute to a social/ human problem (Creswell, 2014). The research methods for qualitative approach include data, which is not numerical, such as conducting interviews, surveys, questionnaires or society discussions etc. The

collected data therefore can be presented as text or also put in charts or tables. The second research approach- quantitative, comes from "quanti"- "how many" and refers to numerical data. The design of this type of research approach is related to testing hypotheses, theories and the relationship between variables, by applying statistical analysis. Research methods for quantitative research approach can be experiments, polls or questionnaires, that include numerical data. Then, the information gathered can be delivered in charts, graphs, or other types of nontextual representation. Lastly, mixed methods approach refers to using both qualitative and quantitative approach, by collecting both numerical and non-numerical data. This type of data collection provides a more comprehensive insight of the defined research problem. However, it is essential to acknowledge that the suitable and most appropriate research approach is relative for different research, depending on the field of study, research problem, research questions and the purpose of the study. An important aspect to be considered when choosing a research approach are philosophical assumptions, in particular philosophical worldviews- "a basic set of beliefs that guide action" (Petersen & Gencel, 2013). Postpositivist, constructivist, transformative and pragmatic are the four types of philosophical worldviews (Creswell, 2014). Verification of theories, observation of scientific methods are the highlights of the postpositivist worldview, and it is more applied in quantitative approach, rather than qualitative. Constructivist worldview is applied mainly in qualitative research and seeks to not indifferently accept information, but 'constructing' observations and upgrading the existing knowledge about the world with new ones, gained through experience. Transformative worldview twines together politics and political reforms and addresses fairness in society and is oriented towards change and impact on individuals and their lives

(Creswell, 2014). This worldview can be used for both qualitative and quantitative research approach. A worldview, that is mainly used in mixed methods research, is pragmatism. The main concept of the pragmatic worldview is to make use of the existing approaches and have the research problem as a centerpiece, with the aim to understand the issue (Petersen & Gencel, 2013).

3.2 Research design

The purpose of this thesis is to examine the potential outcomes of the National Recovery and Resilience Plan on the Bulgarian socioeconomic systems, as well as the potential digitalization socioeconomic impact, outlined in the Plan. The study is related to politics and change in individuals lives. Therefore, the most suitable worldview would be transformative. As mentioned, this worldview is suitable for all types of research approaches. However, the National Recovery and Resilience Plan is not yet applied, and real outcomes are unknown. Furthermore, limitations of data and studies exist, as well as statistical analysis. Thus, the convenient research approach is qualitative. In order to fill the gaps in data and most accurately answer and discuss the research questions, expert interviews have been chosen, as a source for primary data collection.

3.2.1 Data collection

The interviews were designed with the aim to get further insight and information, related to the study, and answer the research questions. Therefore, three interview sets of 10 questions were developed, each of them designed depending on the field of the expert. The structure of the interviews could be defined as semi structured, because the prepared questions differ from one another, depending on the field of the interviewee. Moreover, some questions included a follow-up question.

The questions were mostly related to digitalization of sectors, digital

Ray Pinto	***Andreana Atanasova***	***Michaela Kalaijieva***	***Gergana Passy***
⇒ Expert in the field of digital transformation ⇒ Director of Digital Transformation in DigitalEurope ⇒ Over 20 years of government affairs and communications experience	⇒ Governmental representative ⇒ Deputy Minister of Transport, IT and Communications of Bulgaria ⇒ Over 20 years of experience in the field of communications and European affairs	⇒ Private sector ⇒ Chief Corporate Affairs Officer of Telenor in Bulgaria ⇒ Over 20 years of experience in the spheres of law, regulations and telecommunications sector in Bulgaria	⇒ Non-governmental organization ⇒ Founder of Digital National Alliance (DNA) ⇒ Digital champion of Bulgaria since 2012, founder of DNA in 2013, President of PanEuropa Bulgaria

transformation and digital as an important objective, described in the Recovery and Resilience Facility. Topics, related to the digitalization of Bulgaria, such as the low DESI of Bulgaria and foreseen socioeconomic impact of the digital transformation of Bulgaria, were also discussed. Furthermore, funding allocation for the development of the Bulgarian telecommunication infrastructure and levels of cooperation between the stakeholders, are also topics of interest and were included in the interview questions. Moreover, positive and negative impacts of automation and AI on the socioeconomic systems of Bulgaria were also topics, that were raised.

The interviews have been conducted with four experts in different fields, associated with the research. They have been selected with the aim of obtaining most accurate and relevant information, and moreover, getting diverse views and expertise.

Table 6.
(Experts overview; Author's illustration)

The first expert is the Director for Digital Transformation in the European organization "DigitalEurope"- Ray Pinto. After a video discussion for "The Economist" on the topic "EU Recovery and Resilience Fund for Bulgaria's transition: Innovation-Green Agenda- Digital Transformation", where Ray Pinto participated, the interest towards his knowledge and the field of his expertise arose. The second expert is the Deputy Minister of Transport, IT and Communications of Bulgaria, responsible for information technology and communications, Andreana Atanasova. Her field of expertise is essential for obtaining primary data, because she is directly engaged with the digitalization transformation of Bulgaria. Thirdly, a non-governmental organization has been chosen to deliver additional important aspect of the digital transformation and its socioeconomic impact. Therefore, the digital champion of Bulgaria since 2012 and founder of Digital National Alliance in 2013, Gergana Passy, is the third expert, has been chosen to be interviewed. The digital transformation is dependent on other stakeholders, such as the private sectors. Therefore, a leading telecommunication company was selected to contribute to the primary data collection process. The company's name is Telenor and the expert, which participated in the interview, is Telenor Bulgaria's Chief Corporate Affairs Officer, Michaela Kalaijieva. She leads the teams, which are in charge of political affairs, privacy and regulations, and supervises the relations with the main stakeholders.

Unfortunately, due the coronavirus pandemic, the interviews could not be conducted face to face. Moreover, some of the experts did not have the ability to conduct the interview via video communication. Thus, the

most suitable and chosen approach was to send each one of them the interview questions via email. The interview questions were conducted between 24th of March 2021 and 14th of April 2021. However, one of the interviewees proposed an online video meeting, which took place on the 6th of April 2021. The meeting was recorded and then transcribed into text.

The collected data, which will be presented in section 4.1, was extremely useful for the purpose of the study and despite the current situation, it was exciting to conduct the interviews, especially the video conference.

3.2.1.1 Limitations

Limitations in research constitutes a threat to giving a reliable answer to the research questions. However, these limitations exist and are inevitable. To begin, the difficulty to reach out to experts from the European Commission or other experts from a high rank, resulted in the limited sample size, of conducting only four interviews. Furthermore, as mentioned, due to the coronavirus pandemic, conducting the interviews face-to-face was impossible. Another obstacle that exists, is that the conducted interviews via email can be somehow biased, because the interviewees had the time to think through the questions and not answering instinctively. However, the interview with one of the experts was conducted via video conference and a great discussion was formed. Understandably, Ray Pinto had forty minutes for the interview, and unfortunately two out of ten questions were left unanswered.

3.2.2 Data analysis

When gathering primary data, regardless of the research approach, the data collected must be analyzed. Data analysis is an essential section of the research course, because it helps describe, examine and asses the

findings of the data, which will further answer the research questions and conclusions can be drawn. Matthews and Ross (2010) suggest that the collected data from a semi-structured interview is called “raw” data- the own words of the participants, which has to be analyzed in relation to the research questions. As already stated, three out of four interviews were conducted via email, in a written form. Only one of the interviews was recorded and it was transcribed with a software, which transforms speech to text (Otter.ai). The transcribed text was afterwards checked for accuracy in the translation process.

Subsequently, the findings from the analyzed data will then be examined for a correlation with the theory analyzed in the literature review. This can be referred to as identifying semantic association, defined by Jabeen et al. (2019) as “quantifying the strength of a semantic connection between two textual units, based on different types of semantic relations”.

3.3 Research ethics

The interview attendees were informed about the intention of the interview, in the email description, where the interview questions were attached. They were assured that their responses will be used solely for the purpose of this research and the information gathered will not be communicated with any other individual or entity. Moreover, the interviewees shared their personal opinions and views for the discussed topics, even if they are in contrast with the theory findings. No personal information was asked, despite their names, field of expertise and job position, which upon their agreement, is included in the data analysis. Identifying the experts will contribute to the reliability of the information provided.

4 Results

The results section is divided into two parts- data analysis and findings and discussion. The first subsection will provide the analysis of the interviews, where the responses of each expert will be analyzed individually. The second subsection will draw the semantic association between the theory discussed in the literature review (secondary data) and the information drawn from the data analysis, which is the collected primary data.

4.1 Data analysis

4.1.1 Ray Pinto (DigitalEurope) interview analysis

As a director of digital transformation in DigitalEurope, Ray Pinto outlines three essential areas of digital transformation- infrastructure, basic digital skills and data. The non-personal data is rich and valuable, as well as of a great importance for innovation of products and creation of startups, however, as stated by Pinto, the Single Market should clarify the rules for the cross-border data flow. European Data Protection Board are data protection authorities, which are responsible for the data protection, as reported by Pinto. However, he claimed that AI can do essential functions for the healthcare systems, without having the strongest data protection.

Pinto states, that connecting remote areas is of a great importance for their development and a minimum amount of data speeds should be available everywhere across Europe. Moreover, he declared that the internet connection is meaningful for economic, welfare, health and education reasons. However, he was not familiar whether the governments of the Member States should provide the funding for the digital transformation, or other stakeholders, such as the private sector, should be also involved.

According to Pinto, the foreseen impact of digital transformation and automation on the socioeconomic systems will be mostly positive. He stated that the digital tools can be used for good and for bad. However, the fast development of the COVID-19 vaccine was with regards to Artificial Intelligence and data. These tools can further cut down costs for development and application of other activities. It goes hand in hand with climate change, energy efficiency, as well as reduction in waste and greenhouse gases. Other positive aspects of digital transformation, according to Pinto, include transparency in governmental activities and connectivity among people, and in his opinion, the benefits will always outweigh the costs and risks. A temporary adverse effect on the socioeconomic systems would be job loss- around 12%. Thus, many new job opportunities will arise. Pinto acknowledged, that Bulgaria is strong in the life science sectors, solid programming and coding community, and the government should support and invest in these sectors, to lift the country.

Pinto recognizes that digital has quickly become a huge priority, probably because of the COVID-19 crisis. As he recognized, 20% of every National Recovery and Resilience Plan must go for digital. The cooperation between the stakeholders, especially the ones in the health sectors, has been at a very good level, as stated by Pinto. However, his opinion is that the governments have to accept that they do not have the needed expertise to conduct the digital transformation and they should cooperate with the experts.

For Pinto, a successful digital transformation is when it is reducing greenhouse gases, finding solution for sustainability and climate change, improving the social connections and helping competitiveness and

growth. In his opinion, the digitalization transformation is an endless process.

4.1.2 Andreana Atanasova (Deputy Minister) interview analysis

The interview questions for the Deputy Minister of Transport, IT and Communications of Bulgaria were similar to the ones of Ray Pinto, however there were some differences. Some questions were addressed specifically in relation to Bulgaria, since it is related to Atanasova's field of expertise.

According to Andreana Atanasova, the National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014-2020 has fulfilled 60% of the objectives, which were set. The unrealized objectives included the creation, advancement and extension of broadband infrastructure in rural areas. However, the deputy minister claims that one of the pillars in the National Recovery and Resilience Plan, has addressed targets of building a modern and safe digital infrastructure. A great focus is to fight the digital divide, specifically in the rural areas, and the pandemic has highlighted the importance of e-Government and e-Health. According to Atanasova, there is no particular funding allocation for the development of telecommunication infrastructure. The intended investment under the RRF will be used for the passive infrastructure, and it will be established and operated by private operators. However, the telecommunication operators are unwilling to invest in the passive infrastructure, mostly in rural and sparsely populated areas, because of the high deployment costs and vile income from the consumers in the areas, due to their low purchasing power.

The Digital Economy and Society Index of Bulgaria classifies last among the Member States for the past two years, due to the poor policy coordination, as stated by Atanasova. It is needed for the promotion of the development of very fast broadband networks and the acceptance of digital technologies in the economic and social sectors. Moreover, Atanasova is on the opinion that Bulgaria is procrastinating the digitalization in the country's economy and some of the main aspects that contribute to the low DESI include low levels of digital skills, lack of Information and Communications Technology experts, in addition to poor investments in digital infrastructure. Digital growth can be achieved, if modern broadband infrastructure is deployed and the digital skills of the citizens is increased. As stated by Atanasova, the Recovery and Resilience Facility and its defined components can contribute to the improvement of the DESI, due to the commitment made to intensify the digital transition. More than 28% of the total budget of the National Recovery and Resilience Plan of the Republic of Bulgaria will be assigned for the advancement of the Bulgarian digital transition, which include the infrastructure, digital skills, e-Government and e-Services. Furthermore, new opportunities, such as distance education, remote working and advanced digital skills, are outcomes, which can be achieved by the provision of high-speed broadband network and thus contribute to the increase in the performance of Bulgaria in the DESI. The deputy minister claimed that the realization of digital growth will result in higher productivity and efficiency, thus support the economic development of Bulgaria. Other priorities stated by Atanasova include demographic growth and lowering social disparities. Bulgaria has the potential to digitally transform all important industries and can realize it by creating an efficient and secure environment. The national ambition instrument "Digital Transformation of Bulgaria for the period 2020-2030" includes

strategies, aiming to improve the current infrastructure, in regard to enabling very high-capacity networks, including 5G, achieving low-carbon economy, through digitalization, as well as enhancing the efficiency of public administration and public services and releasing data potential. These elements are crucial for laying the foundation of reaching digital economy and society. Moreover, e-Health, e-Government, research, establishment of innovative model of business and technology enhanced learning can be developed by upgrading connectivity. If every citizen of the country has sufficient digital connectivity, enabled by high-capacity networks, the economy will be developing, by providing modern tech digital services. According to Atanasova, all these elements will contribute to the better performance of the country's DESI.

The next generation of mobile communications (5G) is also an important technology for the successful accomplishment of digital transformation. Atanasova acknowledges the fifth generation technology will be highly beneficial for innovation, by developing new ICT infrastructures, and furthermore beneficial for the quality of life, because of the availability of intelligent health services, limitless access to data, connected mobility and e-Government and telemedicine. Furthermore, it gives a possibility to citizens to overcome the socioeconomic isolation.

Socioeconomic resilience can be reinforced by achieving a successful digital transformation, as stated by the deputy minister. However, digital tools can be used for good or bad depending on how the user uses them. Automation may replace manual work at some sectors and will lead to less need of employees, which will expand the rate of unemployment, disruption to local economies, and may result in rise in inequalities. Cybercrime can also increase, due to rise in the usage of internet

banking. A solution Atanasova states, is that people should be in the center of digitalization. Furthermore, she claims data protection is also a solution for online fraud. According to Atanasova, the personal and non-personal data is stored, transferred, refined and further destroyed securely and it is an obligation of the administration is to protect personal data. She claims the data is a vital asset for the Bulgarian government and cross-border data flows relation with the European Union Member States should be developed.

Automation is highly beneficial because it will increase industrial production, which will result in economic growth and increase in incomes, as well as increase in living standards. For that to be realized, digital skills and knowledge among the citizens of Bulgaria should be developed. The above mentioned negative impacts of automation can be prevented, if investments in education, training and workplace benefits are made. The deputy minister defines as vital the coordination between all stakeholders for the successful accomplishment of the digital transformation. This group of stakeholders include the public institutions, which have the obligation the establish legal and regulatory environment, fostering the innovation through investments, which include attracting financing and investments from the EU funds. Another stakeholder in the process is the private sector, which can take advantage of the new environment and create efficient supply chains, establishing new markets and new business models, which should be in accordance with the objectives of digital transition. Atanasova states, the COVID-19 socioeconomic crisis requires a stable, collective and critical measures for the recovery of the Bulgarian economy and promote sustainable and comprehensive growth.

4.1.3 Michaela Kalaijieva (Telenor) interview analysis

The set of questions, which was addressed to the private sector, namely the telecommunication company Telenor, was equivalent as the one, addressed to the deputy minister. The interview was conducted with Telenor Bulgaria's Chief Corporate Affairs Officer, Mihaela Kalaijieva.

Sustaining competitiveness and ability for digitalization were the main priorities of the National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014-2020, as stated by Kalaijieva. As a representative of a private sector, she declared that the areas, where the objectives of the Plan were not implemented, were related to the telecommunication infrastructures in remote areas and their development is significantly lagging. A reason is the lack of private investments. However, Kalaijieva claimed, that the National Recovery and Resilience Plan has the purpose to leverage private investments, in order to reduce the digital division among areas and accomplish the new standards of society connectivity, established by the EU. It can be achieved by enabling broadband connectivity, especially in the areas, which are lagging behind. Moreover, Kalaijieva declared this will provide resilience to the COVID-19 crisis and overcome future potential disruptions faster. As a representative of telecommunication company, Kalaijieva states they could not achieve the goals set by the European Union by themselves and when implementing the funds provided by the Recovery and Resilience Facility, the government have to be cautious not to push away potential private investments in essential areas for the society. Furthermore, the funding for the development of telecommunication infrastructure can be provided by private sectors in the field of telecommunication services or the State funds- public investment. Kalaijieva declares that these stakeholders should cooperate

in the process with the support of the funding, provided by the RRF, in order to achieve the targets of digital connectivity and conquer the digital divide.

According to Kalaijieva, Bulgaria has a poor performance in three out of five components from the Digital Economy and Society Index and namely "human capital", "use of internet services" and "integration of digital technology". However, the Chief Corporate Affairs Officer of Telenor in Bulgaria claims that the National Recovery and Resilience Plan can promote the improvement of these areas and the overall DESI, by the solid funding, which has set requirements for the projects related to digital. Moreover, Kalaijieva states that the RRF funds will lead to successful digital transformation, and this will lead to the overall improvement of DESI of Bulgaria. Some of the objectives supported by Telenor include distribution of 5G coverage along the highways, ultra-high-speed communication networks, especially in sparsely inhabited and rural communities, with the priority of consumers to benefit from the developed infrastructure. For Kalaijieva, the priority areas for digitalization include healthcare, agriculture, energy, digital governance, education and training, as well as cybersecurity. However, she sets latest generation digital infrastructure as a priority, in order to achieve digital transformation in the outlined areas, to sustain the modern socioeconomic life. Thus, innovation and productivity can be expanded by enhanced connectivity and all citizens should benefit from the involvement in the digital economy. Kalaijieva's opinion related to data protection is that it can be insured by various measures and regulations, in addition to decent collection, processing and destruction.

Kalaijieva outlined few potential positive and negative impacts of digital transformation and automation in Bulgaria. The positive aspects include

booster for the economy, increase of competition and resilience of the economy, opportunities for new jobs creation, higher incomes. The inverse aspect included disappearing of working positions and possible digital inequity, due to the difference in the digitalization levels among separate areas. The digitalization in the outlined areas is possible by the deployment of 5G and advanced digital technologies can be implemented. Furthermore, this can make Bulgaria competitive on an international level, according to Kalaijieva. When wide deployment of very high-capacity networks is established, the social and economic benefits of digital transformation will be accomplished. The viewpoint of Telenor's representative regarding successful digital transformation is when the goals for digitalization of the priority areas are fulfilled and all stakeholders take action to achieve these goals. In her opinion the government and relative authorities strongly support the digitalization process.

4.1.4 Gergana Passy (Digital National Alliance) interview analysis

The perspective of a non-governmental organization is essential for a better overview and a greater comparison between the responses. The founder of Digital National Alliance, Gergana Passy, was the fourth expert, with which an interview was conducted. The set of questions was similar to the other two ones, however there were differences, in order to fit her field of expertise.

Modern infrastructure lays down the possibilities for sustainable growth and innovation of digital services based on the exchange of large amounts of data, as stated by Passy. The infrastructure is needed to respond to the needs of the contemporary life of the citizens. The rise in innovation and production can be reached by improving connectivity, thus all individuals have the ability to fully utilize digital services and take

advantage from being involved in the digital economy. Passy declares that rural and sparsely populated areas need most funding for connectivity, for the purpose of economic growth and society wellbeing. Regarding the funding for telecommunication infrastructure, Passy stated that State funds should be used only for areas where private investment is not possible from economical perspective and it should be provided from the private sector, in the field of telecommunication services. She defines the level of cooperation and interaction between the stakeholders as “sufficient”.

The leading advantages from digital transformation include capability of automated services and more collaboration possibilities, in Passy’s opinion. Moreover, organizations can use data, related to their performance, whether they are efficient or need improvement, and this is enabled by the digital transformation. It can also highly benefit employees, with routine tasks which are manual to become automated. Complex technologies, such as artificial intelligence, will be enabled along the digital transformation process. As a founder of a non-governmental organization, Passy informs that the goal of their company is to promote new technologies to a larger scale of individuals, reach a more effective use of digital capacity and support the growth of information and communications technology sector in Bulgaria. Therefore, digital transformation is essential for the accomplishment of their goals.

However, Passy admits that the insufficient degree of digital skills among the society of Bulgaria, the limited number of women in the digital workforce, along with the prejudice of Bulgarians on technologies, are concerns which exist in the digital transformation process in Bulgaria. In

her opinion, a successful digital transformation is the one that meet the needs and benefits the society and economy of the country.

4.2 Findings and discussion

All of the interviewed experts agree that the deployment of latest generation digital infrastructure lays the ground for sustainable digital growth. The theoretical analysis also states the infrastructure as an essential part of digital transformation and is outlined in one of the 6 Commission priorities for the period 2019-2024- *"A Europe fit for digital age".* Kalaijieva and Atanasova agree, that the deployment of these innovative infrastructures was not realized in the "National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014- 2020". Thus, all stakeholders agree that many rural and sparsely populated areas in Bulgaria lack broadband connections and investments in these areas is of a great importance for their development and the connection is meaningful for economic, welfare, health and education reasons. In the section of the National Recovery and Resilience Facility *"Connected Bulgaria",* local development is represented as a target. Part of the funding will be allocated for the deployment of modern infrastructures, to reduce the digital gap among the population of the country. The deputy minister, NGO and Telenor's Chief Corporate Affairs Officer are in agreement that both State funds and private investments should be used for the telecommunication infrastructure, in order to achieve the targets of digital connectivity. However, Passy has the argument that State funds should be used solely for areas, where private investment is not possible. In the section *"Digital connectivity"* over 350 million Euro are planned to be allocated for *"Large-scale deployment of digital infrastructure"* and private investments are also encouraged. Atanasova stated that the

telecommunication operators are unwilling to invest in the passive infrastructure, mostly in rural and sparsely populated areas, because of the high deployment costs and vile income from the consumers in the area. However, the representative of telecommunication operator Kalaijieva claimed they will cooperate in the process with the support of the funding provided by the RRF.

Atanasova and Kalaijieva claimed that the reasons for the low Digital Economy and Society Index involves low levels of digital skills, lack of Information and Communications Technology experts, in addition to poor investments in digital infrastructure.

The interviewees outline similar positive aspects of digital transformation and automation- higher productivity and efficiency, booster for the economy, increase of competition and resilience of the economy, connectivity among people, transparency in governmental activities, new job opportunities, development of e-Government and e-Health (increase in quality of life), e-Services, increase in digital skills, distance education, remote working. Their statements are supported by the theory analyzed, stated by Mergel et al. (2019), European Commission (2020c) and England (2021). Upgrading broadband connectivity will support the establishment of innovative model of business and technology enhanced learning, in addition to increase in innovation and productivity. Furthermore, it will provide resilience to the COVID-19 crisis and overcome future potential disruptions faster. These statements are supported by the theory provided by England (2021) and are outlined in the National Recovery and Resilience Plan of the Republic of Bulgaria (2021).

Both Pinto and Atanasova mention, that digital tools can be used for both bad and good. These tools can be used for cutting down costs, climate

change, energy efficiency, reduction in waste. As a disadvantage of digital transformation, Pinto, Atanasova and Kalaijieva have given the same response- job loss and will result in increase in the unemployment rate. However, investments for educating and training the citizens can help to mitigate the negative effects. Furthermore, they all mention that digital transformation will bring new job opportunities.

Digital skills and knowledge among the citizens of Bulgaria should be developed, in order to increase industrial production, which will lead increase in incomes, thus economic growth. As stated by Von der Leyen (2019), the SMEs are the main contributors to the toughness of the economy. Some of the interviewees mention that the SMEs have the potential to be digitally transformed and can be realized by creating an efficient and secure environment, thus digital transformation will enable data and it will help the functions of SMEs. These claims are also found in the research of Indriastuti and Fuad (2020) and supporting the SMEs in the green and digital transition is take part in the targets outlined in the National Recovery and Resilience Plan of the Republic of Bulgaria (Council of Ministers of the Republic of Bulgaria, 2021).

Atanasova states that 28% from the National Recovery and Resilience Plan of the Republic of Bulgaria will go for digital objectives, but in the Plan, it is calculated to be 32%. However, both are more than the requirement set from the European Commission and the more funding there is allocated for digital objectives, the more successful the digital transition will be.

To reach a digital economy and society, low-carbon economy should be established, enhancing the efficiency of public administration and public services, as well as releasing data potential. Furthermore, Atanasova

claims that socioeconomic resilience can be reinforced by achieving a successful digital transformation and adopting digital tools and this statement is backed up by the document of the European Commission (2021b). The interviewees agree that data is essential for digital transformational and is vital for innovation of products and startups. Pinto and Atanasova mention the importance of laws and regulations for the cross-border data flows. Pinto states that the General Data Protection Regulation are the authorities responsible for the protection of data and the GDPR EU (n.d.) claims to control the processing of personal data of individuals within the European Union, which is in accordance with Pinto's statement.

The level of stakeholder cooperation was defined from some as vital for the successful accomplishment of the digital transformation, others responded that it is on a good level or sufficient.

The interviewees define successful digital transformation identical- when the objectives of digitalization are fulfilled and when it meets the needs and benefits the society and economy of the country (reducing greenhouse gases, finding solution for sustainability and climate change, improving social connections and supporting competitiveness and growth).

5 Conclusion

The National Recovery and Resilience Plan of the Republic of Bulgaria include investments in the sectors of innovation, connectivity, fairness and sustainability. The potential benefits of the Plan on the socioeconomic systems of the country include advancing the competitiveness of the economy, improving education and skills,

supporting research and innovation and develop smart industries, which will promote the productivity of the enterprises in the country and lead to accelerated economic growth, greater employment rates and incomes. Furthermore, aspects of sustainable supervision of natural reserves, in order to respond to the economy and social needs is also addressed in the Plan and will highly promote the life quality (QoL level) of Bulgaria. Providing prerequisites for advancing the competitive capacity and sustainable growth of the regions in Bulgaria, in particular the improvement of transport and digital connectivity, in addition to the promotion of local development, are other targets which will have a favorable effect on the socioeconomic systems of Bulgaria. Lastly, a special focus on underprivileged communities and persons, in order to accomplish a more incorporating and sustainable development, in accordance with shared wellbeing for all, is vital for the successful development of the socioeconomic systems of the country. All reforms outlined in the National Recovery and Resilience Plan of the Republic of Bulgaria will contribute to the economic resilience. The digital transformation plays a key role to the socioeconomic resilience of each country. To sum up, outcomes include higher productivity and efficiency, booster for the economy, increase of competition and resilience of the economy, connectivity among people, transparency in governmental activities, new job opportunities, development of e-Services, increase in digital skills, distance education, remote working. Bulgaria may be among the least developed countries, according to the Human Development Index and Gross National Income per capita, but the country is steadily developing, having a good quality of life index performance. Moreover, Bulgaria has a great opportunity to digitally transform and become more competitive, with the support of the Recovery and Resilience Facility. The coronavirus disease highlighted

the gaps in each country and therefore, the European Union has prioritized several areas, including sustainable digital economy. The future of Europe lies on the capability to transform in order to be competitive and to face the expectations of the European citizens. The path is in the development of competitive economy and industry, which is impossible without digital transformation. It is not an end in itself but is a tool for the accomplishment of higher productivity and value added in all sectors of the economic development. In times like the coronavirus crisis, digital proved to be a priority for both social and economic needs. The RRF is the focused investment, which will support the Member States of the European Union synchronized and coherent, for the purpose of achieving the targets set by the Union of digitally transformed resilient economies.

5.1 Limitations

The limitation in this research includes several aspects. Firstly, the thesis was initiated in the beginning of February and the deadline for submitting the National Recovery and Resilience Plans has been set for April 30th. However, in the beginning of April, the elections for government in Bulgaria were held. Thus, the country did not submit the official Plan was not submitted before, nor after the deadline and has received the approval of the European Commission to submit later on. Furthermore, the Plan was editing three times, which led to some inconvenience. Therefore, the National Recovery and Resilience Plan of the Republic of Bulgaria, which was analyzed in this research may not be the final version and changes in some of the objectives may occur.

5.2 Future research

Future research is highly recommended. An additional research after the official submission of the Plan can be conducted, in order to evaluate whether changes were made. Furthermore, the outcomes of the National Recovery and Resilience Plan of the Republic of Bulgaria are unknown and a research after the implementation of the main pillars and objectives would be highly appropriate.

Bibliography

Agarwal, P. (2020, April 20). *Economic Systems. Type of economic systems.* Intelligent Economist. https://www.intelligenteconomist.com/economic-systems/

Agostino, D., Arnaboldi, M., & Lema, M. D. (2021). New development: COVID-19 as an accelerator of digital transformation in public service delivery. *Public Money & Management*, *41*(1), 69-72.

Amadeo, K. (2020, July 31). *Gross National Income: What it says about a country?* The balance. https://www.thebalance.com/gross-national-income-4020738

Angoloinfo Bulgaria. (n.d.). *Bulgaria - A Country Overview.* Angoloinfo Bulgaria. https://www.angloinfo.com/how-to/bulgaria/moving/country-file/country-overview

Aristodemou, K., Buchhass, L., & Claringbould, D. (2021). The COVID-19 crisis in the EU: the resilience of healthcare systems, government

responses and their socio-economic effects. *Eurasian Economic Review*, 1-31.

Baig, A., Jenkins, P., Lamarre, E., McCarthy, B. and Hall, B. (2020). *The COVID-19 recovery will be digital: A plan for the first 90 days*. McKinsey & Company. https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-covid-19-recovery-will-be-digital-a-plan-for-the-first-90-days

BBC. (2018, May 22). *Bulgaria country profile.* BBC. https://www.bbc.com/news/world-europe-17202996

BBC. (n.d.). *Contrasts in development between different countries.* BBC. https://www.bbc.co.uk/bitesize/guides/z838xsg/revision/2

Begg, R. (2020, March 4). *Medical design: Global Medical Equipment Shortage as COVID-19 Spreads.* Machine Design. https://www.machinedesign.com/medical-design/article/21125385/global-medical-equipment-shortage-as-covid19-spreads

Bhattacharya, S., Smark, C., & Mir, M. (2021). Covid 19: Social, Financial and Economic Implications. *Australasian Accounting, Business and Finance Journal*, *15*(1), 1-4.

Biscop, S., Francioni, F., & Graham, K. (2005). *The European Union and the United Nations: partners in effective multilateralism (*Chaillot paper No.78). Institute for Security Studies.

Bouchrika, I. (2020, December 4). *4 Types of Economic Systems: Which is Used by the World's Biggest Economies?* Guide2Research. https://www.guide2research.com/research/types-of-economic-systems

Brennen, J.S. and Kreiss, D. (2016). Digitalization. *The International Encyclopedia of Communication Theory and Philosophy*, 1–11.

Britannica. (n.d.). *Government and society.* Britannica. https://www.britannica.com/place/Bulgaria/Government-and-society

BSA. (2017, November 12). *Cross-border data flows.* BSA. https://www.bsa.org/policy-filings/cross-border-data-flows

Burns, T., & DeVille, P. (2017). Socio-economics: the approach of social systems theory in a forty year perspective. *Economics & Sociology*, *10*(2), 11-20.

Carlson, L., Haffenden, B., Bassett, G., Buehring, W., Collins, M., Folga, S., Petit, F., Philips, J., Verner, D., & Whitfield, R. (2012). Resilience: Theory and Application. *Argonne National Laboratory (ANL).*

Ceep. (2020, September 25). *Publication on the 2021 Annual Sustainable Growth Strategy.* Ceep. https://www.ceep.eu/publication-of-the-2021-annual-sustainable-growth-strategy/

Citizens Information (2020, March 5). *European Union: The aims and values of the European Union.* Citizens Information. https://www.citizensinformation.ie/en/government_in_ireland/european_government/european_union/european_union.html

Council of Ministers of the Republic Bulgaria. (n.d.). *Form of government.* Council of Ministers of the Republic Bulgaria. https://www.gov.bg/en/About-Bulgaria/FORM-OF-GOVERNMENT/Form-of-government

Council of Ministers of the Republic of Bulgaria. (2021, April 16). *National Recovery and Resilience Plan of the Republic of Bulgaria.* Council of Ministers of the Republic of Bulgaria. https://nextgeneration.bg/14

Creswell, J. (2016). *Research Design.: Qualitative, Quantitative, Mixed Methods Approaches*. University of Nebraska-Lincoln.

Dokov, H., Milkova, K., & Stamenkov, I. (2020). Socio-economic Effects of COVID-19 in Bulgaria: A Spatial Analysis. *TERRITORIAL GOVERNANCE*, *2*, 96-117.

EBRD. (2020). *Transition Report 2020-21 Bulgaria.* European Bank. https://2020.tr-ebrd.com/countries/

Emerging Europe. (2021, January 29). *Bulgaria's economy is holding up well, but there's room for improvement.* Emerging Europe. https://emerging-europe.com/news/bulgarias-economy-is-holding-up-well-but-theres-room-for-improvement/

England, J. (2021, February 18). *5G in digital transformation.* Technology. https://technologymagazine.com/digital-transformation/5g-digital-transformation

EU affairs. (2020, September 30). *Video: what is the multiannual financial framework?* News European Parliament. https://www.europarl.europa.eu/news/en/headlines/eu-affairs/20200924STO87805/video-what-is-the-multiannual-financial-framework

EU2020.de. (2020, December 12). *EU budget and Next Generation EU recovery fund: What happens now?* EU2020.de. https://www.eu2020.de/eu2020-en/news/article/faq-mff-eu2020-maas/2416420

European Commission. (2019, December 17). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. Annual Sustainable Growth Strategy 2020(*COM/2019/650 final). European Commission.

European Commission. (2020a). *Coronavirus response.* European Commission. https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response_en

European Commission. (2020b). *What the European Commission does in strategy and policy.* European Commission. https://ec.europa.eu/info/about-european-commission/what-european-commission-does/strategy-and-policy_en

European Commission. (2020c, December 17). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. Annual Sustainable Growth Strategy 2021(*COM/2020/575 final). European Commission.

European Commission. (2020d, September 17). *Questions and answers: Commission presents next steps for €672.5 billion Recovery and Resilience Facility in 2021 Annual Sustainable Growth Strategy.* European Commission. https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_1659

European Commission. (2020e, September 17). *NextGenerationEU: Commission presents next steps for €672.5 billion Recovery and Resilience Facility in 2021 Annual Sustainable Growth Strategy.*

European Commission. https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1658

European Commission. (2020f). *ERM II – the EU's Exchange Rate Mechanism.* European Commission. https://ec.europa.eu/info/business-economy-euro/euro-area/introducing-euro/adoption-fixed-euro-conversion-rate/erm-ii-eus-exchange-rate-mechanism_en

European Commission. (2020g). *Digital Economy and Society Index (DESI) 2020 Methodological note. https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2020*

European Commission. (2020h). *Digital Economy and Society Index (DESI) 2020 Bulgaria.* https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2020

European Commission. (2021a). *Commission staff working document. Guidance to Member States. Recovery and Resilience Plans* (SWD/2021/12 final/part 1/2). European Commission.

European Commission. (2021b, April 6). *Shaping Europe's digital future: The Digital Compass*. European Commission. https://digital-strategy.ec.europa.eu/en/policies/digital-compass

European Commission. (n.d.-a). *A European Green Deal: Striving to be the first climate-neutral continent.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

European Commission. (n.d.-b). *An economy that works for people: Working for social fairness and prosperity.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people_en

European Commission. (n.d.-c). *A Europe fit for digital age: Empowering people with a new generation of technologies.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_en

European Commission. (n.d.-d). *Promoting our European way of life: Protecting our citizens and our values.* European Commission.

https://ec.europa.eu/info/strategy/priorities-2019-2024/promoting-our-european-way-life_en

European Commission. (n.d.-e). *A stronger Europe in the world: Reinforcing our responsible global leadership.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world_en

European Commission. (n.d.-f). *A new push for European democracy: Nurturing, protecting and strengthening our democracy.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy_en

European Commission. (n.d.-g). *Autumn Package.* European Commission. https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/european-semester-timeline/autumn-package_en

European Commission. (n.d.-h). *Recovery plan for Europe.* European Commission. https://ec.europa.eu/info/strategy/recovery-plan-europe_en

European Commission. (n.d.-i). *Europe's Digital Decade: digital targets for 2030.* European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

European Council. (2020). *Special meeting of the European Council (17, 18, 19, 20 and 21 July 2020): Conclusions* (EUCO/10/20/CO EUR 8/ CONCL 4). European Council.

Eurostat (2014, December 11). *Glossary: Purchasing power standard (PPS).* Eurostat Statistics explained. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Purchasing_power_standard_(PPS)

Eurostat (2020,February 2, 2021). GNI (gross national income) per capita in PPS. *Database by themes; Economy and finance; Auxiliary indicators (population, GDP per capita and productivity) (nama_10_aux); GNI (gross national income) per capita in PPS (nama_10_pp).* Eurostat. https://ec.europa.eu/eurostat/web/main/data/database

Friedrich, R., F. Gröne, A. Koster, and M. Le Merle. (2011, December 13). *Measuring Industry Digitization: Leaders and Laggards in the Digital Economy.* Strategy&. https://www.strategyand.pwc.com/gx/en/insights/2011-2014/measuring-industry-digitization-leaders-laggards.html

GDPR EU. (n.d.). *What is GDPR, the EU's new data protection law?* GDPR.EU. https://gdpr.eu/what-is-gdpr/

Giampietro, M., & Mayumi, K. (1997). A dynamic model of socioeconomic systems based on hierarchy theory and its application to sustainability. *Structural Change and Economic Dynamics*, *8*(4), 453-469.

Gibson, B. (2016, November 11). *Systems theory.* Britannica. https://www.britannica.com/topic/systems-theory/additional-info#history

Grow. (2020, March 9). *Why is data important for your business?* Grow. https://www.grow.com/blog/data-important-business

Hák, T., Janoušková, S., & Moldan, B. (2016). Sustainable Development Goals: A need for relevant indicators. *Ecological indicators*, *60*, 565-573.

Hapon, M. (2020, September 28). *What Is the Difference Between Digitization, Digitalization and Digital Transformation [Updated].* Netguru. https://www.netguru.com/blog/digitization-and-digitalization

Hayes, A. (2020, December 29). *Guide to economics.* Investopedia. https://www.investopedia.com/terms/e/economics.asp

Hellmich, S. N. (2017, January). What is socioeconomics? An overview of theories, methods, and themes in the field. In *Forum for Social Economics* , *46,*(1), 3-25. Routledge.

Human Development Reports Office. (2020). *Human Development Data Center.* Human Development Reports. http://hdr.undp.org/en/data

Human Development Reports. (n.d.). *Human Development Index (HDI).* Human Development Reports. http://hdr.undp.org/en/content/human-development-index-hdi

Ibn-Mohammed, T., Mustapha, K. B., Godsell, J. M., Adamu, Z., Babatunde, K. A., Akintade, D.D., Acquaye, A., Fujii, H., Ndiaye, M. M., Yamoah, F. A., & Koh, S. C. L. (2020). A critical review of the impacts of

COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies. *Resources, Conservation and Recycling*, 105169.

IGI Global Publisher of Timely Knowledge. (n.d.). What is Socio-Economic System. In *IGI Global.com dictionary*. Retrieved March 16, 2021, from https://www.igi-global.com/dictionary/socio-economic-system/38740

Iivari, N., Sharma, S. and Ventä-Olkkonen, L. (2020). Digital transformation of everyday life – How COVID-19 pandemic transformed the basic education of the young generation and why information management research should care? *International Journal of Information Management*, 102183.

Indriastuti, M., & Fuad, K. (2020, July). Impact of covid-19 on digital transformation and sustainability in small and medium enterprises (smes): A conceptual framework. In *Conference on Complex, Intelligent, and Software Intensive Systems*, 471-476.

Investopedia staff (2021, April 27). Gross National Income (GNI). *Investopedia. https://www.investopedia.com/terms/g/gross-national-income-gni.asp*

Jolles, M., & Meyermans, E. (2018). Economic resilience, the Single Market and EMU: a selfreinforcing interaction. *Quarterly Report on the Euro Area (QREA)*, *17*(1), 7-22.

KPMG. (2020, November 18). *European Union: Government and institution measures in response to COVID-19.* KPMG. https://home.kpmg/xx/en/home/insights/2020/04/european-union-government-and-institution-measures-in-response-to-covid.html

Ladi, S., & Tsarouhas, D. (2020). EU economic governance and Covid-19: policy learning and windows of opportunity. *Journal of European Integration*, *42*(8), 1041-1056.

Lal, A., Erondu, N. A., Heymann, D. L., Gitahi, G., & Yates, R. (2020). Fragmented health systems in COVID-19: rectifying the misalignment between global health security and universal health coverage. *The Lancet*.

Leighninger, R. D. Jr. (1978). Systems Theory. *The Journal of Sociology & Social Welfare*, *5(*4), 446-466.

Marchese, D., Reynolds, E., Bates, M. E., Morgan, H., Clark, S. S., & Linkov, I. (2018). Resilience and sustainability: Similarities and differences in environmental management applications. *Science of the total environment*, *613*, 1275-1283.

Matt, C., Hess, T. and Benlian, A. (2015). Digital Transformation Strategies. *Business & Information Systems Engineering*, 57(5), 339–343.

Meiler, Y. (2020). Digital transformation, covid-19 crisis, digital transformation. *Managing a Postcovid19 Era. ESCP Impact Papers. eBook. Paris: ESCP Research Institute of Management (ERIM)*, 171-178.

Mergel, I., Edelmann, N. and Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, 36(4), 101385.

Merriam-Webster. (n.d.). Resilience. *In Merriam-Webster.com dictionary*. Retrieved March 3, 2020, from https://www.merriam-webster.com/dictionary/resilience

Mishra, N. P., Das, S. S., Yadav, S., Khan, W., Afzal, M., Alarifi, A., Kenawy, E., Ansari, M. T., Hasnain, M. S., & Nayak, A. K. (2020). Global impacts of pre-and post-COVID-19 pandemic: Focus on socio-economic consequences. *Sensors International*, 100042.

Montiglio, D. (n.d.). *Cost of Living In The 3 Biggest Bulgarian Cities in 2020.* Foreigner.bg. https://www.foreigner.bg/cost-of-living-in-bulgaria-2018/

Moseiko, V. O., Korobov, S. A., & Frolov, D. P. (2015). Socio-economic systems' competitiveness assessment method. *Asian Social Science*, *11*(20), 1.

Mućk, J., & Hagemejer, J. (2019, May 6). Exports are the main driver of economic growth in CSE. *Obserwator finansowy.pl.* https://www.obserwatorfinansowy.pl/in-english/macroeconomics/exports-are-the-main-driver-of-economic-growth-in-cse/

Nations online. (n.d.). *Bulgaria.* Nations online. https://www.nationsonline.org/oneworld/bulgaria.htm

NextGenerationBG. (2021). *National Recovery and Resilience Plan.* NextGenerationBG. https://nextgeneration.bg/14

Nordea. (2021). *Country profile Bulgaria.* Nordea. https://www.nordeatrade.com/en/explore-new-market/bulgaria/travel-information

Omann, I., & Spangenberg, J. H. (2002). Assessing Social Sustainability: The Social Dimension of Sustainability in a Socio-Economic Scenario.

Pardeller, S., Kemmler, G., Hoertnagl, C. M., & Hofer, A. (2020). Associations between resilience and quality of life in patients experiencing a depressive episode. *Psychiatry Research*, *292*, 113353.

Parsons T. (1961). An Outline of the Social System. *Theories of Society,* 421-440.

Parsons, T. (2007). *An outline of the social system [1961]*. na.

Parviainen, P., Kääriäinen, J., Tihinen, M., & Teppola, S. (2017). Tackling the digitalization challenge: How to benefit from digitalization in practice. *International Journal of Information Systems and Project Management*, 5(1), 63–77.

Petersen, K., & Gencel, C. (2013, October). Worldviews, research methods, and their relationship to validity in empirical software engineering research. In *2013 joint conference of the 23rd international workshop on software measurement and the 8th international conference on software process and product measurement*, 81-89.

Pinto, S., Fumincelli, L., Mazzo, A., Caldeira, S., & Martins, J. C. (2017). Comfort, well-being and quality of life: Discussion of the differences and similarities among the concepts. *Porto Biomedical Journal*, *2*(1), 6-12.

PWC. (2021, January 4). *Bulgaria: Overview.* PWC. https://taxsummaries.pwc.com/bulgaria

Redman, C. L. (2014). Should sustainability and resilience be combined or remain distinct pursuits?. *Ecology and Society*, *19*(2).

Rodríguez, P. M. (n.d.). 7. THE EU BUDGET: THE NEW MFF AND THE RECOVERY INSTRUMENT: NEXT GENERATION EU. *Instituto Español de Analistas Financieros,* 169-181.

Rohova, M. (2020, December 12). *Bulgaria: Workforce.* COVID-19 Health system response monitor. https://www.covid19healthsystem.org/countries/bulgaria/livinghit.aspx?Section=2.2%20Workforce&Type=Chapter

Schengen visa info. (n.d.). *The European Union and Countries in the EU.* Schengen visa info. https://www.schengenvisainfo.com/eu-countries/

SDG Knowledge Hub. (2019, December 19). *EC Releases Economic Strategy for People and Planet.* SDG Knowledge Hub. http://sdg.iisd.org/news/ec-releases-economic-strategy-for-people-and-planet/

Sherrieb, K., Norris, F. H., & Galea, S. (2010). Measuring capacities for community resilience. *Social indicators research*, *99*(2), 227-247.

SID. (2021, February 17). *What is development.* SID. https://sid-israel.org/en/what-is-development/

Skevington, S. M. (2007). Quality of Life.*Encyclopedia of Stress.* Elsevier, 317-319.

Stavytskyy A., Kharlamova G. & Stoica E. A. (2019). The analysis of the Digital Economy and Society Index in the EU. *Baltic Journal of European Studies, 9*(3), 245-261.

Stroeva, O., Lyapina, I. R., Konobeeva, E. E., & Konobeeva, O. E. (2015). Effectiveness of management of innovative activities in regional socio-economic systems.*European Research Studies Journal, 18*(3), 63-76.

The World Bank. (2021a, April 8). *Overview: Context.* The World Bank. https://www.worldbank.org/en/country/bulgaria/overview

The World Bank. (2021b, April 8). *Overview: Economy.* The World Bank. https://www.worldbank.org/en/country/bulgaria/overview#3

Tisdell, C. A. (2020). Economic, social and political issues raised by the COVID-19 pandemic. *Economic analysis and policy*, *68*, 17-28.

Tisdell, C. A. (2020). Economic, social and political issues raised by the COVID-19 pandemic. *Economic analysis and policy*, *68*, 17-28.

UNDP. (2020). Human Development Report 2020. *The next frontier: Human development and the Anthropocene.* New York. http://www.hdr.undp.org/en/content/human-development-report-2020

United Nations. (2006, July 3). *United Nations Member States.* United Nations. https://www.un.org/press/en/2006/org1469.doc.htm

United Nations. (2021). *The 17 Goals.* Department of Economic and Social Affairs: Sustainable Development. United Nations. https://sdgs.un.org/goals

United Nations. (n.d.). *About us.* Peace, dignity and equality on a healthy planet. United Nations. https://www.un.org/en/about-us

VanBreda, A. D. (2001). Resilience theory: A literature review: With special chapters on deployment resilience in military families & resilience theory in social work. *South African Military Health Service, Military Psychological Institute, Social Work Research & Development.*

Velavan, T. P., & Meyer, C. G. (2020). The COVID-19 epidemic. *Tropical medicine & international health*, *25*(3), 278.

Ventegodt, S., Merrick, J., & Andersen, N. J. (2003). Quality of life theory I. The IQOL theory: an integrative theory of the global quality of life concept. *The Scientific World Journal*, *3*, 1030-1040.

Von der Leyen, U. (2019). Political guidelines for the next European Commission 2019-2024. *European Commission, Brussels. PE*, *658*, 2020-54.

World Data Info. (2020). *Comparison of quality of life worldwide.* WorldData.info. https://www.worlddata.info/quality-of-life.php

World Health Organization. (2021). *Health topics: Coronavirus.* World Health Organization. https://www.who.int/health-topics/coronavirus#tab=tab_1

Appendices

Appendix 1 Interview with Ray Pinto

1. What are the priority areas for digitalization (private sector; human capital; institutions and policies)?

Well, look, this, these all these comments are from my own personal views. So, they don't reflect directly what the trade association has as an official position. But if I attach to this question, I think there is a technical side of digitalization. And then kind of what it needs to achieve. You need primarily, the infrastructure. We can't do that call if we don't have, decent internet. And the faster internet that people have access to, the faster there is digitalization. I think the infrastructure is one key area to these skills. So, the general population, they need to know how to use those skills, those digital tools, basic digital skills is very low in the EU, it has improved somewhat in the past couple of years. And then you have to make sure that there is funding. And then I think the other part for digitalization to succeed is you need lots of data. And that means that the rules in the internal market have to be clarified, there's still a lot of question marks on how non personal data can flow over borders, how to get member states to put that non personal data to be available. And then how do you get personal data to be exchanged or viewed or accessed. What is the role of the private sector in that, which should be, they should have access to this data? Because that's how you create startups. That is how you innovate with products. And that's how generally Europe can provide a maximum amount of value. If you look at a marketplace that is close to 500 million people. It is really the marketplaces that have data and the most interesting is the diversity. But the EU has different

languages and people and views, which makes that data extremely rich and extremely valuable.

2. Which stakeholder groups should provide the funding for the development of telecommunication infrastructure for the digital transformation?
    1. <u>If there is funding allocation, what is the share of each of the stakeholder of such a fundraising?</u>

You need to make sure that no remote region is kind of left behind, it will not be able to develop. The Internet, and it's not just for economic reasons, it is for welfare reasons, for health reasons, for education purposes. So, I think you need a minimum amount of data speeds across everywhere in Europe. How that should be done. That's a difficult, very difficult question. Should it just be for Member States governments to pay for it. Should the private sector also be involved? Or other stakeholders be involved? Very complicated question. I can't say I have that answer.

3. What are the foreseen positive and negative impacts of digital transformation on the socio-economic systems within a 10-year period?

I think over 10 years, right? That's very generous. I think in 10 years, you will see mostly benefits. You will see massive transformation of what today is extremely complicated. But for example, rolling out vaccines, getting emergency material to be delivered on site in areas that we saw, and COVID having the communications needed to share important data that would create a vaccine, this was done very fast, faster than probably any vaccine in the history of humankind was ever created. A lot of it had to do with AI. A lot of it had to do with having access to data. The more you have those two things, the faster you'll be able to not only create

vaccines but to create cures, treatments, help people with disabilities, help people, who are suffering, from cancer or immune deficient diseases or rare diseases. It brings the cost down, right with normally will be treatment for rare diseases is just not manageable or affordable. The more data, the more AI, the more digital. Those costs drop predictions in, in diseases on sets of cancer, for example. I think it's literally a short period where an AI can conspire cancer, way better than, than a human eye. That's going to be in 10 years. So I think I think when you look at climate change, when you look at energy efficiency, when you look at the reductions of resources, that's all going to be digital, when you do buildings, they will no longer have to make buildings, based on old systems, it will all be digitized in advance, they'll have the right amount of spacing or remove the errors, they will cut the waste, and everything will be done a lot more efficiently. Digitalization, really the number one word is efficiencies and efficiencies always mean reduction in waste, reduction in greenhouse gases. So, I think you'll see that quite dramatically. People will be better connected, and intelligent systems will be more operational to prevent traffic jams and to allow people to communicate, it should create more transparency in government, with technologies like blockchain, everything's visible, everything's recorded. Those are all the positives; I can literally go on and on and on about the positives. And if you look at the benefits versus cost versus risk, as a triangle, you will always see that the benefits will outweigh the cost and risks. Will there be no costs? Will there be no risk? I'd be an idiot, if I said that would be the case. I think in the short term, before the 10 years, we are going to see a digitalization or automation, leading to job loss. Right, I think the numbers are most likely grossly exaggerated. I think it'll be closer to 12%. But when you look at the number of new jobs that will be created, and we've seen this time, and time and time again, even from

the 1800s where automation of dependence on agriculture, and a move to urbanization there leads to a massive job explosion and job increase. The benefits economically will be felt in a more of a positive way than in the shorter term. Yes, I think we have to definitely make sure, and I think this is, again, digital tools, they're tools, and they can be used for good and for bad. I don't think it's going to move as fast as people think it will. If you look at the kind of the beginnings of AI, the creation of a certain test, called "The Imitation Game" by Alan Turing, the speed of innovation and change, computers are going to be so powerful, that they will beat what he created and called "The Imitation Game", and how that works is you have a person who is getting readouts from two different boxes and that person can type in questions and the readouts will try to fool that person, which is the AI and Turing said that, by the 70s, maybe the 80s internet, our processing speeds and capabilities will be able to fool humans. It is 2021 and a human has never been fooled. I don't think considering how faulty my Kindle does in recommending books. I really think we're far away from AI to becoming any kind of threat.

4. How would automation impact the socioeconomic systems (positive and negative aspects)?

I think we covered the automation aspect in the previous question.

5. How could the administrative/ personal data be secured during and following the digital transformation?

We've got to make sure we're not mixing up privacy, data protection and cybersecurity. Data protection is very much the GDPR. It's the laws, it's the rules. And here we are, where we have the most robust rules ever created in the history of humankind, but this system is not perfect. I think there are issues that have to be dealt with, but the very good news is, is that it is being dealt with. It's taken very seriously. You have very smart

professional people under resource in the European Data Protection Board, so these are data protection authorities, who are excellent, and trying to solve these important questions. And also, in questions of how we get data to be shared internationally, because if you imagine linking up the EU, to the US, for example, you probably have the cure to cancer in there somewhere. These things have to be dealt with, they are being dealt with seriously, as a consumer, you don't trust something, don't use it. Caveat emptor, right? Buyer beware, do not use something, if you don't trust it. And that's something that all social media understand. That's why they're bending over backwards to try to solve these issues, asking for regulation, putting in new systems in place to try to ensure that people's policies are being accepted. For AI in healthcare, you look at how some things probably don't need the strongest rules. Some of them are very simple like AI ordering toilet paper for a hospital. Do we need the strongest data protection rules and AI rules for that? No. The AI should figure out how much toilet paper hospitals need and order it and it should go to someone that has a real name, and they're identified and so it can be delivered properly. And we got to understand we have to apply these rules, where it becomes a danger, and where we want to preempt these dangers from happening. So, ex post and ex ante, these new rules before and after the fact. There are probably some areas where you want to approach with caution, for example, an AI diagnosing and prescribing drugs to people. That will never happen. Never, ever happen. I don't think there's ever been a risk of this happening. But yes, we should make sure it doesn't happen. Not until we have robust systems that can be tested, and we're decades away from that.

6. How could the digital transformation foster the cohesion process between the Member States?

I think it is where it can give your country particularly industries a competitive advantage. It's not always about who has the most data. This is where people keep getting confused about. It's how you approach these things with the expertise and the knowledge base, and Bulgaria has a very strong amount of that in the life sciences sector. There are going to be pockets, where Bulgaria I think is going to leave are exposed to life sciences. You have a very strong programming and coding community, as well, in Bulgaria, all of these have to be nurtured. If you want to kind of lift the country by its bootstraps, then it really means an investment and nurturing of these industries, to break Bulgaria outside of its kind of traditional industrial basis, and create massive new revenue streams, that it can trade and exchange with, and I think in digital services you have a lot of smart people. They can create these technologies, it's your race to lose, I really do think so. You just need government with political courage to not be killing. It's entrepreneurs with red tape, they should have access to funds, they should have access to data, I understand the corporate tax in Bulgaria is like 10%. So that should help in creating our tracking businesses. I think I think in all those areas, it will help.

7. What is the role of digital transformation for the inclusion or exclusion of vulnerable groups of the population?

Question not answered.

8. How do you perceive digitalization would impact the lives of people in the short-term, as well as in the long-term?

Question not answered.

9. How would you define a successful digital transformation?

I think the thing where it becomes successful is that the disruption is causing no harm or not, I should say too much harm. Disruption causes harm, transformation will create disruption. People will lose jobs. But disruption causes massive change. And that change should always be for the better. And if that it's successful, if it's driving down, greenhouse gases, finding answers for sustainability and climate change, improving our social fabric, helping competitiveness and growth, then I think it's been very successful. If it's doing the opposite, it's not successful. And I think it'd be very hard for it to be opposite. In business to business, it can be only upwards and no matter how much waste or pollution the tech sector creates, which is always being addressed. It's always being looked at; it's always being reduced. It's always about efficiencies, if you want to make a data center that cost a billion, your CEO wants you to do the same in two years, that costs half that amount. Otherwise, that's not a successful CEO. The industry is definitely creating its own efficiencies, but the efficiencies that these technologies put on other industries.

10. How would you define the level of cooperation and interaction that exists between the stakeholders in the digitalization process?

I don't know if it was COVID, but definitely digital has moved from the back of the class to running the school. I've never seen such a prioritization, such a massive shift in gears in a government in my 20 plus years, that I've been doing this job. In every ministry, digital probably never went across the desk, except in the last year. Now it is everywhere.

Everyone needs to get on to it. It's 20% of the of the money that's going to go for recovery and resilience, plus another for the smart countries, another 20 odd percent, where they're using it for sustainability reasons and improving their industries and that type of thing. This is all very new for everybody, including us in the digital sector. I think the cooperation has been very good, particularly in the area of health. Everyone is rowing in the same direction. I think that's good. I still think that that Europe is way too hung up on consumer. It's still there still there still seems to be this kind of quiet desire to create the next French Google or Facebook. I don't think that's going to happen, or the best thing to invest in money, especially on French brand of a French citizen, I'd rather see them spending 100% of the money into areas where France is extremely strong in, which is manufacturing, transportation, pharmaceuticals. This is clearly where France could be the next global leader. Don't go into that consumer technology area, the Asian than the Americans beat us. We have to accept that we have to move forward. And I think your business to business, we will clearly be leaders and that has to be our number one focus. I think all the stakeholders stuff is good. I think when it comes to investment, the incentives need to be created. But there's still a long road ahead. I think that that that, where governments have to admit, we do not have this expertise, we need to work with the experts. Otherwise, we'll just have countries putting 6 billion into public administration.

Appendix 2 Interview with Andreana Atanasova

1. What were the socio-economic outcomes of the National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014-2020?

By the beginning of 2020, the Bulgarian National Broadband Plan for 2014-2020 reached an implementation rate of 60%.

- In which areas was it successful and in which was it not?

The basis of the priorities set out in the Plan were the construction of a new broadband infrastructure for next generation access, the efficient use of the radio spectrum and soft measures for facilitating these aims. The Plan focuses on to achievement of the objectives set out in the Digital Agenda for Europe.

The only measure from the Plan that was not realized in the timeframe is an intervention under the Rural Development Programme for creation, improvement and expansion of broadband infrastructure and measures for access to digital solutions. The measure was carefully analyzed in order to achieve results with a significant impact. The planed financial resources of 30 million EUR are increased to 42 million EUR. The preparatory phase is underway, and it is envisaged that the project will provide connectivity in 59 "white" areas. These areas were chosen on the basis of the data on next generation broadband, which includes information on the availability and geographical location of the regional operators' infrastructure.

- How could the RRF support socioeconomic development in the areas where the Plan was not successful?

Before the establishment of the RRF Bulgaria adopted an Updated National Plan for Next-Generation Broadband Infrastructure called "Connected Bulgaria". The Plan outlines national goals and priorities and

is linked to the goals at the European level until and after 2025. This document is more ambitious and sets the following national priorities:

- *ultra-high-speed infrastructure - creating conditions for the deployment of networks with very large capacity.*
- *broadband infrastructure - accelerated construction of broadband infrastructure, incl. for the needs of the state administration.*
- *effective use of the radio frequency spectrum - 5G.*
- *improving the coverage in settlements located in peripheral, sparsely populated and rural areas.*
- *encouraging the use of digital technologies by providing free internet access; network security.*

These targets and aims for building a modern and secure digital infrastructure in order to overcome the territorial imbalances laid down in the draft of the National Recovery and Resilience Plan under the Recovery RRF as well. Pillar 3: "Connected Bulgaria" includes a project proposal "Large-scale deployment of digital infrastructure on the territory of Bulgaria". The main objective of the proposal is to build symmetric gigabit backbone/backhaul networks throughout the country with a focus on underserved parts of the country and creating conditions for connecting with networks at European level. Currently significant parts of Bulgaria are excluded from the possibility to connect to very high-capacity networks, which is an impediment to the growth of the gigabit society in Bulgaria. In addition, this digital divide further increases the risk of rural depopulation of large parts of the country. Thus, the improvement of coverage in settlements with focus on peripheral, sparsely populated and rural areas has a dual aim of stimulating rural areas on the one hand and bringing broadband access to all Bulgarians on the other hand.

2. What are the main factors contributing to the low DESI ranking of Bulgaria?

In 2020, for the second year, Bulgaria ranks 28th in the European Commission 's Digital Economy and Society Index (DESI) 2020, in terms of the overall entry of digital technology into the economy and society. The data shows that better policy coordination is needed to promote the development of high-speed broadband networks and the penetration of digital technologies in all spheres of economic and social life. The information and communication technology sector in Bulgaria is developing dynamically, increasing its contribution and added value for the employment and exports. ICT is a major driver of the digital revolution globally, but despite some comparative advantages, Bulgaria is lagging behind in the digitalization of its economy. There is a need to intensify efforts to improve and accelerate the deployment of broadband access to the Internet, given the fundamental role of modern broadband infrastructure in achieving so-called digital growth. At the same time, action must be taken to increase the effectiveness of measures implemented to increase the digital skills of the population and to widen their scope significantly when partnerships are deployed with the private sector.

- How can it be improved with the support of the RRF?

The RRF offers an opportunity to speed up and reinforce the commitment to the digital transition. The National Recovery and Resilience Plan sets high level of ambition and concentrates in the area of the Bulgarian digital transition more than ¼ (28%) of the total provided budget. The efforts are focused not only on deployment of broadband infrastructure but also to raising the digital skills of the population, acceleration the introduction of digital technologies in enterprises and on deployment of e-government and e-services. Both e-Government and e-Health services are crucial during the pandemic but are also important in fighting the digital divide and providing equal opportunities. That is why access to

very fast broadband connections and supporting the demand side are very important especially for people living in rural areas. This negative trend can be changed by expanding the possibilities for using different types of access at an affordable price. Increasing access to very fast internet will create new opportunities for distance learning, work and improved digital skills and correspondingly significantly better country performance in the DESI index .A recent report highlights the economic impact of improvements in DESI performance, specifically that a 10% increase in the DESI score is associated with a 0.65% higher GDP per capita. This means that the relative impact is greater for countries starting from a lower digital development base as Bulgaria, and that digital growth may also play a role in accelerating the growth of smaller economies. This impact on GDP per capita is driven by the productivity and efficiency gains afforded by digital technologies.

- How could the RRF, Digitalization transformation of Bulgaria, other strategies benefit the DESI of Bulgaria?

The digital transformation is a necessary process of technological development of Bulgaria in order to create conditions for innovation and business growth, increase the efficiency of the workforce, a competitive digital economy, and a high citizens' standard. The strategic goals of our country set in the "National Development Program: Bulgaria 2030" are to accelerate economic development, demographic growth and reduction of social inequalities. By 2030 Bulgaria should build a functioning and secure environment to unlock the full potential of digital technologies for the digital transformation of all key sectors, reaching the average European values under the DESI. One of the main priorities in the adopted national strategic document "Digital Transformation of Bulgaria for the period 2020-2030" is to improve the existing infrastructure by ensuring the wide deployment and use of very high-

capacity networks (VHCN). High-speed fiber-optic routes, as well as fifth-generation networks, will be among the most important building blocks of the digital economy and society. Improving connectivity will allow the development of innovative business models in many sectors such as research, digital and distance health, security, logistics, autonomous and connected vehicles, digital governance and digital education, and the development of "smart cities". Support for high-speed connectivity will be accompanied by measures to increase digital skills and stimulate the demand for Internet based services by citizens and businesses. The strategy aims to include technological disciplines and digital skills in curricula at all levels of education and vocational training and retraining systems. The main goal in the Updated National Broadband Infrastructure Plan for Next Generation Access "Connected Bulgaria" is by 2030 Bulgaria to be equipped with gigabit-symmetric access networks throughout the country. The sustainable fiber network, combined with a universal access mobile network, will allow every citizen, business and public institution to use the digital opportunities on equal terms and conditions throughout the country. The digital divide will be overcome at a maximum level by deploying digital connectivity in the remote and sparsely populated regions and raising the digital competences and skills of the population. The government aims to address the digital needs of families, schools and businesses that face difficulties in subscribing to broadband Internet services. Adequate broadband connections will allow those groups to have remote access to education, healthcare and teleworking, also in the context of the emergency caused by the COVID-19 pandemic. Access to adequate broadband services is also fundamental to allow citizens, students and employees to be included in the digital economy. The implementation of these activities will help to overcome the digital divide, increase digital

skills, wider use services of e-government and e-health, which will contribute to better ranking of the country in DESI.

3. What are the priority areas for digitalization in Bulgaria (private sector; human capital; institutions and policies; regional inequality)?

The digital transition is key to strengthen the social and economic resilience, to achieve sustainable growth potential and job creation. The COVID-19 pandemic has accelerated the trends towards the digital transformation by reinforcing the significance of digital infrastructure, online education and SMEs digitalization. The national priorities are:

- *Deployment of secure digital infrastructure.*
- *Providing access to adequate technological knowledge and digital skills.*
- *Research and innovation capacity strengthening.*
- *Unlocking data potential.*
- *Digitalization in favour of a circular and low-carbon economy.*
- *Improving the public administration efficiency and the quality of public services.*

The goal of the widespread use of digital technologies is to reduce the use of energy and resources. The implementation of innovative digital technologies will be accelerated in long term, and investment in these areas can greatly support the future sustainability of the economy, the health system and public services.

4. What are the foreseen positive and negative impacts on the socio-economic systems when the main objectives of the digital transformation of Bulgaria?

The digital transformation affects all aspects of the economy, society and government. Its success and full opportunities utilization depend on the existence of a comprehensive state approach in the making, implementation and monitoring of the policy in this area.

Technological advancements will significantly improve our living standards. Enhanced technological developments in the field of medicine will guarantee access to high quality medical services. Very high-capacity networks greatly benefit people especially in rural areas to study and work online. Digitalization can connect underserved and unreached people to make it easier for them to access technological services. The digital transformation will strengthen the export orientation and competitiveness of the economy and the transition to a circular and low-carbon economy. Enterprises should be encouraged to contribute by modernizing their technological base, adapting their business models to future changes, implementing the principles of sustainable development and taking advantage of innovation based on digital technologies. The industry is the innovation's engine. It undergoes a profound transformation, driven by digital technologies and new business models. Therefore, modernization efforts are needed to ensure that our industry is competitive. For this purpose, new technological changes should be accepted, and new products and services should be integrated. It is necessary also to develop and implement technologies that use less energy reduce waste and avoid pollution, and to invest in a workforce with adequate skills. Particular attention should be paid to the support for start-ups and small and medium-sized enterprises (SMEs), which comprise a significant share of the Bulgarian economy. The implementation of products, technologies, business models, in order to achieve modernization, automation and competitive positioning of the Bulgarian economy in medium to long term can turn Bulgaria into a regional center of the digital economy. Use of technology can serve as an advantage or disadvantage, based on how the user uses it. As most of the things

will become more automated, technology will reduce the need of manual work in organizations. This can increase the rate of unemployment, so we have to put people in the center of digitalization. With the growing online financial transactions, the possibility of cybercrime and frauds can also increase. These negative trends can be reversed with an appropriate policy in the field of personal data protection, protection of employment through retraining programs, preservation of social values with a responsible social policy.

5. How would automation impact the socio-economic systems of Bulgaria (positive and negative aspects)?

The accelerated digital transformation is a prerequisite for the anticipated development of industry production, for economic growth, and increasing incomes. The development of this process requires adequate and timely measures to increase the knowledge and skills of citizens, to acquire new skills and qualifications and to create a culture of lifelong learning that corresponds to the increasingly dynamic nature of the labor market. While automation boosts economic growth, creates jobs, and improves living standards, it can also present serious challenges for workers and communities, including job displacement, disruptions to local economies, changing skill needs, and rising inequality. Thus, investments in education, training, and the social safety net, along with a social contract between employers and workers that provided workplace benefits and protections, will help mitigate automation's negative impacts. In this regard, the coordination of efforts between state institutions at all levels of government, as well as the active involvement of all key stakeholders, including the business community, trade unions, civil society and the technical Internet community, in this process, is crucial.

6. How will the administrative/ personal data be secured during and following the digital transformation?

Information is a key asset to our government and its correct handling is vital to the safe and effective delivery of public services. Citizens, businesses and public authorities need to be confident that their information assets are safely and securely stored, processed, transmitted and destroyed, whether managed within the organization or by partners and suppliers. Equally, the administration has a legal obligation and duty to safeguard personal data entrusted to it by citizens and businesses. In striking the right balance between enabling public services, sharing and protecting data, organizations must assess and manage the risks to the services they provide and to the confidentiality, integrity and availability of the information assets they are formally responsible for. The effectiveness of ensuring citizens' and public data security is directly dependent on the huge amount of information structured in extremely big datasets that can be analyzed, modelled, and can allow detection of trends and associations, especially those related to human behavior. Processing of large volumes of data received from both independent sources and specialized information systems is the future of the data economy. The aim is while using optimal financial resources, highly qualified staff and innovative technologies to achieve efficiency in ensuring the protection of the population, interoperability of information, realization of cross-border connections with EU Member States and providing easily accessible services to the administration and citizens at a national and European level.

7. Which stakeholder group should provide the funding for the development of telecommunication infrastructure for the digital transformation of Bulgaria?

The main goal of the Bulgarian government is to build a modern and secure digital infrastructure and to overcome the territorial imbalances associated with the spread of broadband access. In this way, the utilization of the economic and social benefits of information and communication technologies related to overcoming obstacles in distance and development, especially in rural areas, will be favored. Regarding the Bulgarian project, named "Large-scale deployment of digital infrastructure on the territory of Bulgaria" under the RRF, the Ministry of Transport, Information Technology and Communications will implement the coordination of the main project activities in partnership with the State e-Government Agency. The planned investment under the RRF will take place in the form of a neutral passive infrastructure, providing backhaul and mobile sites along the TEN-T network. The passive infrastructure will be built, operated and owned by private operators. Contracts will be awarded by a way of an open, public non-discriminatory selection procedure, by securing a wholesale access to it for all interested parties.

- If there is funding allocation, what is the share of each of the stakeholder of such a fundraising?

There is no particular funding allocation. The selection criteria will be transparent and open. Private operators are reluctant to invest in backhaul and access networks in areas that are mostly remote, rural areas with low and diminishing population density, which is due, on the one hand, to significant infrastructure deployment costs and, on the other, to the low profitability of such investment. Another factor that makes private investments in the respective zones unattractive to private operators is the relatively low purchasing power of local residents and thus the number of potential customers of telecommunications services compared to the investments would be significantly unprofitable.

Deploying backhaul networks in those areas will lower the cost of building access networks, bringing fiber closer to the end costumer. The project will subsidize private and state telecom operators to deploy telecom infrastructure and increase access in Bulgaria.

8. How is 5G essential for the digitalization transformation and in particular of Bulgaria?

The next generation of mobile communications (5G) is a key technology to achieve digital transformation and are therefore the focus of the public's attention. 5G will be a key component of the gigabit networks of the future and will require entirely new ICT architectures. For the private and public sectors, 5G offers huge opportunities for innovation and added value. This technological evolution has the potential to improve the quality of life through intelligent health services, connected mobility, e-government, respectively m-government and, last but not least, unlimited access to sources of information.

Bulgaria strives to achieve the European strategic goals, incl. for 5G communities. The development of 5G technologies will make mobile downloads much faster as the responsive mobile internet will create new opportunities for distance learning and work. 5G networks will provide secure access to cloud content, business applications, telemedicine. Digital infrastructure is a prerequisite for unrestricted access to public services, regardless of the place and time. This will create more opportunities for people to overcome economic and social isolation. Local enterprises will be facilitated and motivated to implement new business strategies and models, to develop innovative products and services competitive on regional and international markets. The labor mobility will allow the creation of new jobs and the acquisition of market niches. Citizens, for their part, will not only have easier access to digital

services in the field of health and social services, but also to online education and courses for professional qualification, cultural exchange, etc. Pillar A of the project "Large-scale deployment of digital infrastructure on the territory of Bulgaria", is devoted to deployment of 5G connectivity along key transport corridors. The pillar aims to create conditions for the construction of uninterrupted wireless access, as well as to encourage joint use of infrastructure. Efforts will be aimed to ensure 5G connectivity along trans-European transport corridors (TEN-T), thus creating conditions for effective use of intelligent systems in order to promote innovation and investment by applying means of increased flexibility in the use of spectrum. Such new technology will create conditions for development of intelligent transportation systems, as well as a new way to become fully integrated by allowing massive simultaneous connections and ubiquity of network, even under high mobility situations or densely populated areas.

9. How would you define a successful digital transformation?

The Bulgarian government recognizes the digital transformation as a necessary process of technological development in order to create conditions for the innovation and business growth, to increase the efficiency of the workforce, to create a competitive digital economy and a high standard of life for citizens. The deployment of networks with very high capacity to ensure that no part of the country or group in society will remain without adequate digital connectivity is the basis for the development of a dynamic and innovative economy and provides better access for businesses to diverse, high-quality and innovative digital services. The main focus of the policy will remain citizens and businesses. Access to digital solutions will be facilitated, given their key importance for achieving digital growth, together with intensifying efforts to approve and accelerate the deployment of a broadband access. Rural

and remote areas in the country will be specifically addressed, which are currently lagging behind in their connectivity, thus reducing the risk of digital exclusion, with impressions on their attractiveness as a place of living, tourism and business activity. The COVID-19 pandemic has accelerated the trends towards the digital transformation by reinforcing the significance of the digital infrastructure, online education and SMEs digitalization. The broadband access is recognized as one of the main tools for improving the economic and social well-being of the population. It is becoming an increasingly important factor not only for the competitiveness of enterprises, but also for the supporting social inclusion, while simultaneously expanding the opportunities for development and use of digital-based services, including e-Government services. The deployment of high-speed connectivity can lead to a significant increase in gross domestic product, employment, the competitiveness of national economies on the international stage and increase the quality of life. In the short term, government policy is aimed at increasing the resilience of the national health system and mitigating the socio-economic consequences of the COVID crisis. This is made possible through measures to support enterprises and employment and to ensure appropriate safe working conditions with a view to the resumption of economic activity, making full use of the various tools available.

10. How would you define the level of cooperation and interaction that exists between the stakeholders in the digitalization process?

The digital transformation is a process characterized by the widespread implementation and combining of digital technologies in all spheres of public and economic life. The success of the Bulgarian digital transformation lies at the multi-stakeholder model in making socially

significant decisions and in building business platforms for cooperation. The process of digital transformation, if the state manages it in a timely, adequate and competent manner will change the model of interaction with citizens and businesses regarding the provision of public services and will increase the public administration efficiency. Efforts will be focused on reducing the number of administrative services and transforming them into internal administrative ones, making the electronic interaction between citizens and business with the state the main and preferred way, eliminating the use of paper documents at the expense of electronic documents and increasing the maturity and trust of society in electronic interactions. The public sector, and in particular public institutions, will play an increasingly important role in establishing the necessary legal and regulatory environment promoting the innovation by facilitating business access to finances and attracting investment, incl. through the European Union funds. The private sector can benefit from the new conditions for creating efficient supply chains, opening up new markets and creating innovative business models that are also in line with the goals of the digital transition. The economic and social consequences of COVID-19 are unprecedented and call for strong, collective, and urgent measures to restore Bulgaria's economy to sustainable and inclusive growth. We believe that the process of digital transformation should be carried out together with people pursuing their benefit by targeted implementation of new models, solutions and applications for inclusion and development of human potential based on building a digital culture and thinking to achieve concrete results and enrich the life of citizens. The provision of affordable digital services to all citizens, including to those in the small settlements of economically disadvantaged areas where there is no business interest, should be supported by public funds.

Appendix 3 Interview with Michaela Kalaijieva

1. What were the socio-economic outcomes of the National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014-2020?

The main goals of the National Broadband Infrastructure Plan for Next Generation Access of Bulgaria for the period 2014-2020 are maintaining competitiveness and enabling the digitalization. The development of electronic communications in Bulgaria shall allow a significant step of change in terms of achieving an entirely new level of digital connectivity in the country and will help to overcome the aftermath of the pandemic.

- In which areas was it successful and in which was it not?

The public investment projects in remote areas where there are no incentives for private investments focused in high speed connectivity are currently insufficient. In the remote areas all sectors are and continue to be affected due to the lack of electronic communication infrastructure – industry, end users, institutions, respectively their development in all aspects lags behind.

- How could the RRF support the development in the areas, where it was not successful?

The RRF, in connection with the goals outlined in the draft National Recovery and Resilience Plan concerning broadband connectivity, targets specifically the areas lagging behind in terms of next generation access and high-speed connectivity. This way the gap between the different areas shall be reduced. Our understanding that the primary goal of the RRF in the sphere of digital and green transitions is to leverage private investment into achieving this new level of connected European society, which is resilient to the aftermath of the current crisis and yet to overcome future crises much faster compared to what would otherwise be commercially possible by making sure that the significance of the funds made available is of consequence to match the task. It is clear to us that, despite how successful and willing to invest is our industry, we could never achieve the magnitude of the set by the EU goal by ourselves. At the same time, it is as equally crucial to ensure that by carrying out the task set by the EU's Recovery and Resiliency policy, the State is investing in a way that would ultimately not crowd out private investment in areas that are commercially viable.

2. What are the main factors contributing to the low DESI ranking of Bulgaria?

The DESI index is a composite index, composed of five sub-indices: human capital, use of internet services, integration of digital technology, connectivity, digital public services and connectivity. The first three indicators are especially low. One of the main factors is insufficient funding.

- How can it be improved with the support of the RRF?

The RRF, with its significant funding and its guidelines and rules for the related projects, provides a structural approach for improving the all the DESI indices.

- How could the RRF, Digitalization transformation of Bulgaria, other strategies benefit the DESI index of Bulgaria?

Successful digitalization transformation of Bulgaria, especially with the use of RRF funds, will inevitably lead to the improvement of relevant DESI indices. We fully support the choice of the 4 axes preliminary outlined by the sector Ministry, namely the deployment of uninterrupted border-to-border 5G coverage along the highways, the roll-out of ultra-high-speed broadband networks with focus on peripheral, sparsely populated and rural areas, the green initiative for equipping base stations with alternative energy solutions, as well as setting a sensible voucher scheme for 5G devices thus ensuring that the consumers get the full benefit of the newly built infrastructure.

3. What are the priority areas for digitalization in Bulgaria (private sector; human capital; institutions and policies; regional inequality)?

We consider that the priority areas for Bulgaria are energy, agriculture, healthcare, digital governance, education and training, cybersecurity. However, on the first place is the digital infrastructure as a stable basis for each digital transformation. The availability of latest generation

infrastructure is one of the main prerequisites for sustainable growth, innovation and provision of a wide range of digital services based on the rapid exchange of large volumes of data. This infrastructure should be able to support the rapidly increasing traffic, large coverage, low latency and the ability to transmit data in the volume, speed and reliability needed to meet the requirements of the contemporary socio-economic life. The improved connectivity will play a crucial role in increasing the innovation and productivity, as well as enabling everyone entity or individual, regardless of its real location, efficiently to use all available digital services and to benefit from the participation in the digital economy.

4. What are the foreseen positive and negative impacts on the socio-economic systems when the main objectives of the Digital transformation of Bulgaria for the period 2020-2030 are met?

Positive impact: increase of the competitiveness and sustainability of the economic; anticipated development of industry production; new sources of revenue from new business models and services that create jobs; economic growth; increasing incomes; Negative impact: digital inequity – different digitalization levels and digital dissociation. For example, in the big cities where high speed connectivity is ensured telemedicine, digital government, remote education could be efficiently applied and at the same time the residents of the remote areas or least densely populated areas, that are not in the investment focus, shall not have

access to the same service because of the lack of high speed electronic communication infrastructure.

5. How would automation impact the socio-economic systems of Bulgaria (positive and negative aspects)?

Positive impact: booster for the industry, i.e., the automation of the production processes shall lead to efficiency increase and cost reduction, which is a precondition for higher profits, respectively to their potential reinvestment and consequently the expansion of the business. Negative impact: more jobs are likely to disappear

6. How could the administrative/ personal data be secured during and following the digital transformation?

By implementing adequate measures as per the existing and emerging regulatory requirements to ensure the ongoing security and resilience of the data, as well as its proper collection, handling, and disposal. 7.

7. Which stakeholder group should provide the funding for the development of telecommunication infrastructure for the digital transformation of Bulgaria?

o If there is funding allocation, what is the share of each of the stakeholder of such a fundraising?

The funding on one hand could be provided by private investment on behalf of the undertaking providing electronic communication services and/or networks and on the other hand – by public investment through State funds. State funds should target only areas where private investment is not economically feasible, the other areas is expected to be covered by private investments. We believe in this regard that the best possible approach would be to allow operators to lead the investment initiative in parallel with the State by supporting it in

overpassing the gap necessary to reach the targeted achievement in terms of next level digital connectivity and ultimately overcoming the digital divide. This approach would also be in line with European Commission's vision according to which RRF's funds should ideally be deployed in a way that supports operators to expand and modernize their fixed and wireless networks.

8. How is 5G essential for the digitalization transformation and in particular of Bulgaria?

The essential advantages of the fifth generation technology as higher data rates, low latency and high density of connected devices will allow the development of a wide range of new business models in different areas like autonomous driving, digital agriculture, trading, energy, digital learning, digital governance, digital healthcare and logistics, digital infrastructure. Through next generation of mobile technology Bulgaria can implement advanced digital technologies and to take advantage of the offered opportunities such as, big database, robotics and artificial intelligence, blockchain, 3D printing and others. Only this way Bulgaria can be competitive on international level. The digital transformation requires significant improvement of the existing infrastructure. The full economic and social benefits of the digital transformation will be achieved if a wide deployment and use of very high-capacity networks are ensured. That's why 5G networks will be among the most important precondition of the digital economy and society over the next years.

9. How would you define a successful digital transformation?

The successful digitalization should be fast, covering most of the abovementioned areas, simultaneously supported by all stakeholders.

10. How would you define the level of cooperation and interaction that exists between the stakeholders in the digitalization process?

We believe that on one side the government and the competent authorities (Ministry of Transport, Information, Technology and Communication and Communication Regulation Commission in particular) fully support the digital transformation and on the other side the competition itself naturally drives the technological innovation among the big market players.

Appendix 4 Interview with Gergana Passy

1. How could digital transformation benefit the recovery and development process of the economy of Bulgaria?

The availability of modern infrastructure is an important prerequisite for sustainable growth, innovation and provision of a wide range of digital services based on the rapid exchange of large volumes of data. This infrastructure should be able to support the rapidly increasing traffic, providing coverage of a sufficient capacity and the ability to transmit data in the volume, speed and reliability needed to meet the needs of modern life. The improved connectivity will play a crucial role in increasing the innovation and productivity, as well as enabling everyone, regardless of the location, to make full use of digital services and benefit from participation in the digital economy.

2. Where are the areas of particular interest and needs for the funding allocation (connectivity, services, automation, transportation, telemedicine)?

Connectivity in remote and less populated areas needs the most funding allocation. This will ensure economic growth and will contribute the whole society.

3. Which stakeholder group should provide the funding for the development of telecommunication infrastructure for the digital transformation of Bulgaria?

o If there is funding allocation, what is the share of each of the stakeholder of such a fundraising?

State funds should target only the sectors where private investment is not economically suitable (as remote areas), the rest of the infrastructure should be deployed based on private investment of behalf of undertaking, providing electronic communication services/networks.

4. Your data is of importance for data analytics. What is your readiness and concerns to share it?

Some of the data could be subject of non-disclosure arrangements, or proprietary information of private entity or other intellectual property rights, which restricts its sharing.

5. How would you transform yourself in accordance with digital transformation?

The main benefits that digital transformation offers are the ability to automate services, increased possibilities for collaboration, and the potential of a culture of innovation. Digital transformation allows organizations to use data to determine how they are performing, where they should focus their attention, and areas that would benefit from streamlining. Digital transformation can also allow employees to focus on higher-value tasks by automating tasks that are currently manual.

6. How could the consumers you represent benefit from the digitalization process?

The main goal of the organization is to attract more people to new technologies, to achieve more efficient use of digital potential and to support the development of the ICT sector in Bulgaria. In this sense, the digitalization process is inevitable part for achievement of our main goals.

7. What are your main concerns related to automation and digital transformation?

The low level of the digital skills in the society; the stereotypes of Bulgarians towards technology, programming and innovation; the low number of women employed in the digital workforce.

8. How would you define a successful digital transformation?

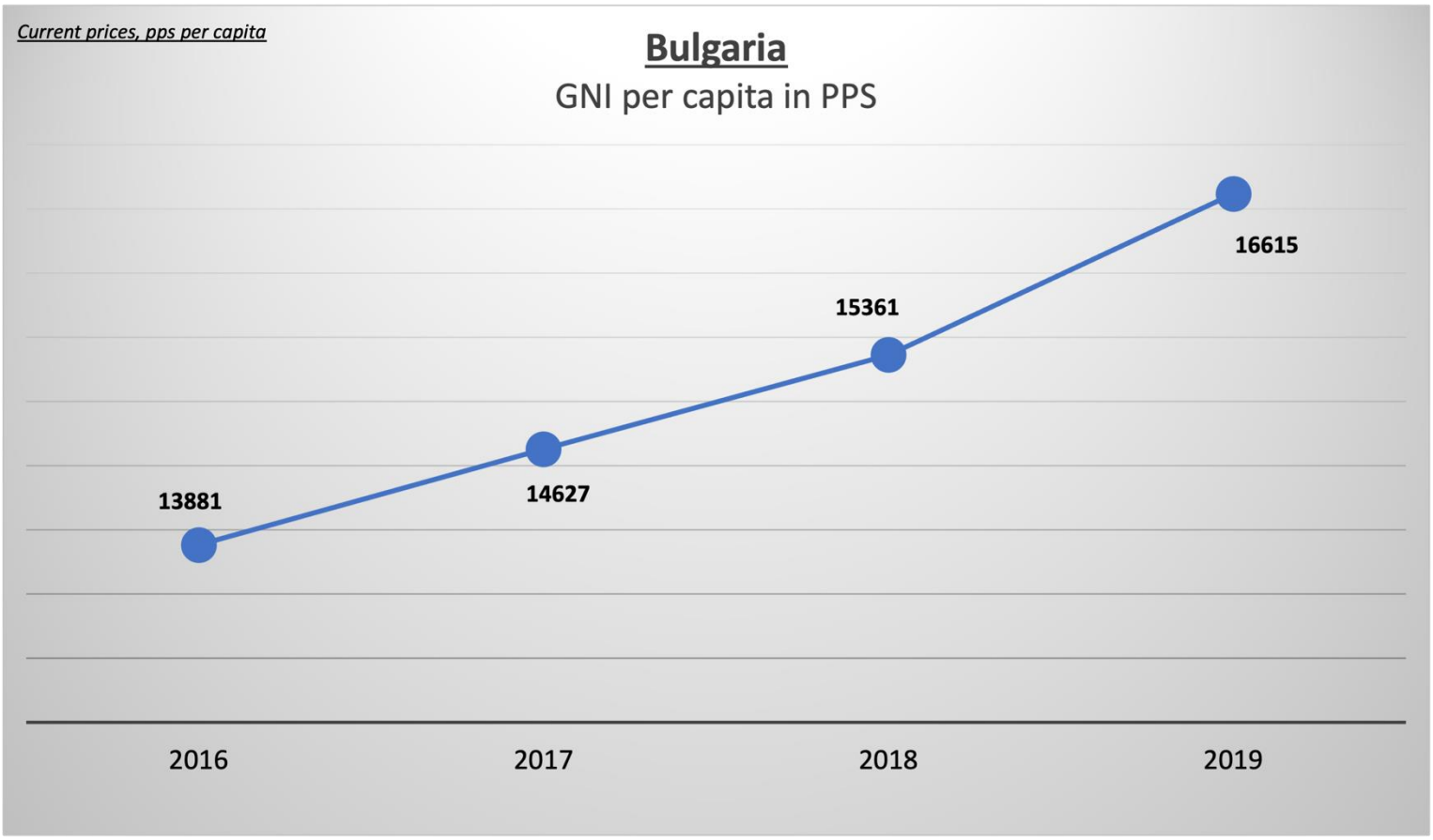
The successful digital transformation is this one, which corresponds to the needs of society and economic. It allows the use of more sophisticated technologies, such as artificial intelligence, the Internet of Things, and advanced neural machine-learning techniques.

9. How would you define the level of cooperation and interaction that exists between the stakeholders in the digitalization process?

The level of cooperation and interaction is sufficient.

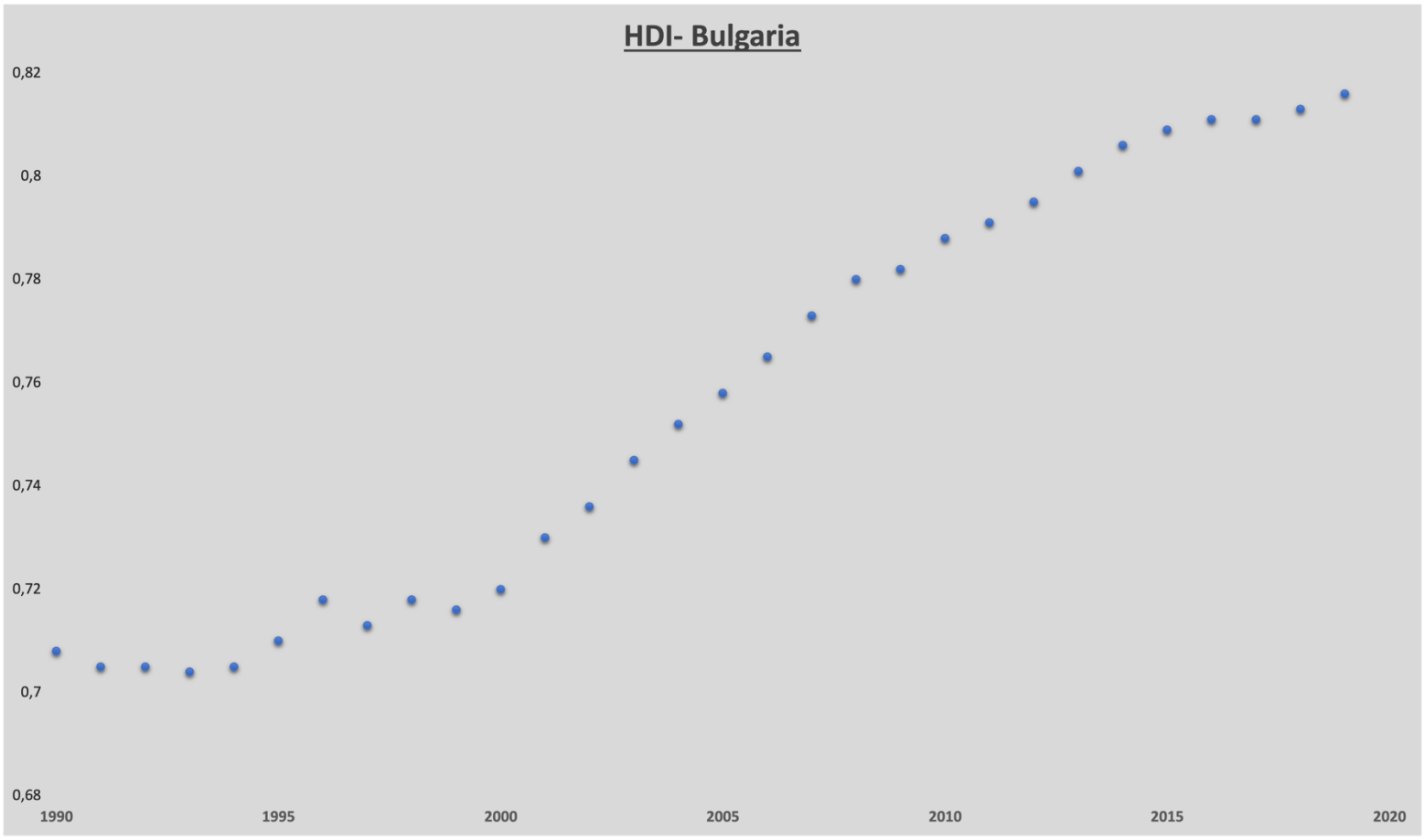
10. How is digitalization such an important objective of the Recovery and Resilience Facility that would allow the recovery from the socioeconomic crises that have negatively impacted consumers throughout the COVID19 pandemic?

See answer 1



Appendix 5

GNI per Capita in Bulgaria for the period 2016-2019:



HDI of Bulgaria for the period 1990-2019:

Pillars and components	**Budget allocation**
Innovative Bulgaria	***1 675.1***
⇒ Education and skills	⇒ 816.2
⇒ Research and innovation	⇒ 185.8
⇒ Smart industry	⇒ 673.1
Green Bulgaria	***2 295.9***
⇒ Low-carbon economy	⇒ 1 833.7
⇒ Biodiversity	⇒ 16.5
⇒ Sustainable agriculture	⇒ 445.7
Connected Bulgaria	***1 412.8***
⇒ Digital connectivity	⇒ 350.3
⇒ Transport connectivity	⇒ 668.6
⇒ Local development	⇒ 393.9
Fair Bulgaria	***1 066.8***
⇒ Business environment	⇒ 237.9
⇒ Social inclusion	⇒ 482.7
⇒ Healthcare	⇒ 346.2
Total NRRPRB budget:	***6 450.6***

Budget allocation for the individual pillars and their subcomponents, as well as total amount for the NRRPRB:

The percentage of total budget and budget allocation for digital objectives for each component of the NRRPRB:

Pillars and components	**Percentage of total budget and budget allocation in million Euro for digital objectives**
Innovative Bulgaria	
⇒ Education and skills	⇒ 59.9% **(488.7)**
⇒ Research and innovation	⇒ 47.8% **(88.9)**
⇒ Smart industry	⇒ 43.8% **(294.8)**
Green Bulgaria	
⇒ Low-carbon economy	⇒ 5.2% **(95.5)**
⇒ Biodiversity	⇒ 0%
⇒ Sustainable agriculture	⇒ 2.7% **(12.2)**
Connected Bulgaria	
⇒ Digital connectivity	⇒ 100% **(350.3)**
⇒ Transport connectivity	⇒ 42.4% **(283.3)**
⇒ Local development	⇒ 37% **(145.9)**
Fair Bulgaria	
⇒ Business environment	⇒ 100% **(237.9)**
⇒ Social inclusion	⇒ 7.1% **(34.2)**
⇒ Healthcare	⇒ 9% **(31.0)**

Twin Transitions: Green and Digital:

Flagship areas for investments and reforms of the Recovery and Resilience Facility: