

Fostering sustainable development through the European Digital Single Market¹

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Abstract: The aim of the study is twofold. Firstly, it is believed to be the first study of its kind to explore the interconnectivity of the current stage of the EU's Digital Single Market (DSM)³ (European Commission, 2015c) and its development prospects within the framework of the EU and its Member States' SD approach. Secondly, it provides further evidence for the policy debate on the essential priorities of DSM deemed to be a stimulus to the future SD of the EU. It is an attempt to fill the existing gap in research conducted so far on SD and its correlation with the building process of the digital market in the EU. The task is to present by using the method of synthesis and deduction, the essence and milieu of the contemporary processes of building the DSM in the EU in the context of its potential influence for the SD of the EU and its Member States. Due to the interdisciplinary and complexity of the data analyses, mixed research methods were used to integrate quantitative and qualitative analyses and results.

Keywords: sustainable development, sustainable development goals, Agenda 2030, Digital Single Market, digitalization, data-driven economy, cyber threats, artificial intelligence.

JEL codes: F02, F63.

Introduction

The European Union (EU) is one of the world's most important players in actively implementing sustainable development goals (SDGs) in its economy and society. An analysis and evaluation of selected EU activities in the Digital

¹ Article received 4 December 2020, accepted 18 March 2021.

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³ The EC defines DSM as follows: "DSM is a space where free movement of goods, people, services and capital is ensured, while citizens and businesses can access or provide online services without obstacles with fair conditions of competition. In that space, a high level of consumer and personal data protection is also guaranteed, regardless of nationality or residence".

Single Market (DSM) is made aimed at creating a framework for the development of the information society, support for e-commerce, a secure process for absorbing new technologies, a new framework for the payment services' environment, digital identification and communication, as well as the protection of personal data, cybersecurity and secure electronic communication in the context of sustainable development (SD).

The aim of the study is twofold. Firstly, it is believed to be the first study of its kind to explore the interconnectivity of the current stage of the EU's DSM and its development prospects within the framework of the EU and its Member States SD approach. Secondly, it provides further evidence for the policy debate on the essential priorities of DSM deemed to be a stimulus to the future EU's SD. The article is a synthetic analysis showing how the market evolution within the DSM and the digitalization process of the market institutions and regulations in the EU affect and thus increase their sustainability through using SD tools including science, technology, and innovation (STI). The study is an attempt to fill the existing gap in research conducted so far on the SD and its correlation with the building process of the digital market in the EU. The nature and comprehensiveness of these processes require an interdisciplinary perspective, a multi-aspect analysis of the instruments and the most important dimensions of the contemporary stage of DSM in the context of their impact on the EU's SD.

The digitalization process within DSM has the potential to influence not only the economy but also our daily lives to make them more sustainable. Yet, there is not a sufficiently developed research approach that allows an examination of the different aspects of its achievements in the context of SD. This study seeks to answer the following questions: (1) What are the main elements of the SD paradigm considering the ongoing changes in the world?, (2) What are the main elements of the DSM?, (3) What are the EU's priorities for regulating the DSM, (4) Which SDGs are correlated with the EU priorities for 2019–2024 (see Table 1), (5) What are the most important instruments and dimensions of the contemporary DSM in regards to their impact on the EU's SD?

The research methodology described below provides the approach used to obtain the objective and answer the research questions identified, as well as leading to reliable results. This paper is organized as follows. It consists of the introduction, which defines the research problem and covers the aim and research questions. The next two parts are devoted to a literature review and describe the methodology used in conducting the research. Section three focuses on analyzing the scope, methods and instruments of SD according to Agenda 2030 (*Transforming our world*, 2015). In the last two sections the background and instruments of the DSM are discussed as well as the trends of the current activities and forecasts for future actions within the DSM with special attention to its interconnectivity with SD. The conclusions sum up the article and elaborates answers to the research questions.

1. Literature review

The history of sustainable development, which has acquired increasing prominence in political agendas in the world over the last two decades, dates back to 1983 when the World Commission on Environment and Development, also known as the “Brundtland Commission” was established by the United Nations (UN) under the initiative of the Norwegian Environment Minister Gro Brundtland.⁴ The term “sustainable development” first appeared at the UN in 1987 in the report *Our common future* of World Commission for Environment and Development, (1987) which defines SD as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Barbier, Markandya and Pearce (1990) are considered to be the founders of the SD concept and the reports of the Club of Rome.⁵ They believe that SD means the achievement of a specific set of socially desirable objectives such as fair access to natural resources, an increase in real income per capita, an improvement in health and nutrition, an improvement in education levels and sustainability and self-sustaining growth. Therefore the stability of natural capital is a fundamental condition for inter-generational justice.

Barlett and Chase’s approach (2013) is significant and states that “sustainable growth relies on satisfying the current needs of a society in such a way that the next generations will also be able to meet their needs”. However, Redclift (1993) notes that the “needs” alone do change over time and for this reason it is unlikely that the needs of future generations will be the same as those of the present generation. Komiyama and Takeuchi (2006) placed great emphasis not only on eliminating growth barriers and poverty, implementing innovative solutions, or increasing intangible assets, but also on protecting the environment and ensuring the possibility of renewing resources, which is of particular importance under the new global conditions. Azmanova and Pallemmaerts (2006)

⁴ The first two paragraphs of this section refer to some items from the National Science Centre (Poland) project [grant number 2012/07/B/HS4/00309].

⁵ In April 1968, a two-day meeting in Rome brought together 36 European economists and scientists. Although the gathering was ridden with divergences and antagonism, a core group remained, their thinking crystallizing around three pillars which continue to define the Club to this day: a global perspective, the long-term and Peccei’s concept of ‘problematique’, or cluster of intertwined global problems. The group met regularly, its numbers swelling to include experts and international decision-makers, but remaining loosely organized with no formal structure or secretariat. Under the supervision of D. Meadows a group of professors at MIT were commissioned by the Club to study the complex problems with which the group was grappling, using the now-famous World3 computer model. The result was the publication of *The Limits to Growth* in 1972, a milestone for the Club and a definitive moment in the advent of the sustainability movement. The Report was ground-breaking, as the first to fundamentally challenge the dominant paradigm of unbridled economic growth without regard for its environmental consequences. Today the Club continues to be at the forefront of challenging and controversial global issues. For more information see: <https://www.clubofrome.org/> (accessed 14.01.2021).

underline that intra- and inter-generational justice principles also underline both the UN concept of SD and the EU policy of SD.

Environmental aspects are also the focus of the classical trend in SD research represented by several authors such as Young (1997), Mulder and van Bergh (2001), Hemmati, Dodds and Enayati (2002), Holden, Linnerud and Banister (2014), Diaconășu, Crupenschi and Pohoăță (2020). The issues of measuring SD have been addressed by Parris and Kates (2003), who reviewed twelve key tests for SD characterization and measurement, as well as by Hák, Janousková and Moldan (2016). The implementation of the SD strategy in the EU and its Member States over recent years was assessed by Domorenok (2019). Due to the new structural economy of Lin (2012) in an increasingly globalizing world opportunities for the SD are located within intra and inter strategic partnership among nations (see also Alves & Biancarelli, 2020).

On September 25–27, 2015, UN Member States signed a new agenda, called *Transforming our world: The 2030 Agenda for sustainable development* (*Transforming our world*, 2015), which was expected to be a milestone in the concept of SD (for more see Section 4). However, recent assessments underline the threats to the entire Agenda (Sachs, Schmidt-Traub, Kroll, Lafortune, & Fuller, 2019, p. 38; Independent Group, 2019, p. 112). Gupta and Vegelin (2016) argue that most subjects focus on SDGs driving economic growth only. Dollar, Kleinberg and Kraay (2013) but also Stiglitz (2019) state that economic growth as such on one hand improves living standards, but on the other may deepen the inequalities within and between countries, as well as negatively influence the environment and thus the public health that is outlined by UN Environment (2020). In this context the discussions on SDGs are more often focused on identifying the directions for optimizing the positive interactions between SDGs and minimizing the negative (van Zanten & van Tulder, 2020, p. 2). Such an attitude is critical to understand their potential and possible weaknesses, creating a greater opportunity to govern them properly and to use the planned tools in the most effective way.

In this study, referring to the above literature review the author relies primarily on the UN concept of SD. That is Earth's SD is a development that meets the basic needs of all people and preserves, protects and restores the health and integrity of the Earth's ecosystem, without endangering the ability to meet the needs of future generations and without exceeding the long-term capacity limits of the Earth's ecosystem. Using the language of economics it can be said that, according to the idea of SD, society should live by considering the environmental, social and economic costs of its decisions. SD means that economic growth should lead to greater social cohesion (including reducing social stratification, levelling the playing field, tackling marginalization and discrimination) and improving the quality of the environment by reducing the harmful effects of production and consumption on the environment and protecting natural resources. This means that all research and political agendas must see that SD

is characterized by a double-fold nature aiming to respond to the challenge of global economic competitiveness on the one hand and capacity limits of the Earth's ecosystem on the other.

As the aim of this article is to study the interconnectivity between the DSM and SD and therefore the review of the literature was also focused on this goal. Such research indicates that most existing literature is rather limited, mainly covering documents and reports of the European Commission (EC), rather than scientific publications and has focused on the basis for DSM, its governance and contribution to growth. In most of these areas the EC has prepared the strategy papers and studies which focus on the DSM but usually rely on ex-ante estimates primarily based on European Commission Impact Assessments that follow legislative proposals. Numerous studies undertake the task of answering how capable the EU is of triggering changes in the actual structure of decision-making processes (Mărcuț, 2017, 2019). Furthermore studies have sought to answer for the DSM's influence on contribution to growth and delivering economic benefits for citizens and businesses (Scott, Petropoulos, & Yeung, 2019), or even on some chosen activities such as services, implementing the open science cloud, the access to Big Data and the chosen branches of industry and services (Duch-Brown & Martens, 2016; ENISA, 2017). To summarize it needs to be highlighted that this paper is one of the early forays into the study of DSM in the context of SD and thus it is based on exploratory research.

2. Methodology

Due to the interdisciplinary and complex nature of this analysis mixed research methods were employed (Creswell, Plano, Clark, Gutmann, & Hanson, 2003) to integrate quantitative and qualitative analysis and results. In order to achieve the purpose of this article the following methods were employed: (1) literature analysis, (2) quantitative methods and (3) the case study method.

To make this process comprehensive scientific literature (Popay et al., 2006), and content analysis (Krippendorff, 2004) were used. Published literature relating to SD and DSM was analyzed with standardized techniques (e.g., Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009). Peer-reviewed scientific papers and books were found in the online databases (Science Direct, Research, Academy, Google Scholar) employing different combinations of search terms. The BOOL-ee-an operators "AND" and "OR" were used to make this search more effective. Publications, books, scientific magazines, articles, acts, and reports of the European Commission, European Central Bank, United Nations, Organization for Economic Co-operation and Development, World Bank, and international scientific institutes were also analyzed to gather the theoretical basis for empirical research. Such a wide range of literature permitted the analysis and discovery of the most appropriate and the most recent

literature and documents. It is also possible to state what has been researched so far in this area, avoiding duplications, and when appropriate, explain what types of actions are deemed necessary. Quantitative methods were also used to carry out this study focusing on collecting and analyzing some empirical data. An of time series of economic indicators, tabular description of materials and data were employed using material obtained from reports of the EC and international scientific institutes. Analyses were carried out accordingly to the type of data collected. Due to discrepancies in data from these sources the empirical analysis was preceded by a thorough verification of the data. Lastly, the case study method was used to show the prospects in the implementation of the new concept of SD in the EU as a result of changes in the scope, methods, instruments and the most important dimensions of the DSM.

Qualitative data was analyzed in line with the principles of thematic analysis (Braun & Clarke, 2006; Bayer et al., 2019) in order to find out from this research whether the resultant DSM gains could be expected not only in lower prices, greater choices for consumers, and higher EU competitiveness, but also a more sustainable, strong economy that masters and shapes technology in a way that respects EU values and in which the development, deployment and uptake of technology makes a real difference to people's daily lives.

3. SD—does it move towards a new paradigm?

Regardless of the pros and cons it has to be admitted that the concept of SD is one of the most important strategies of economic development. It is the only one undertaking the problems of society and the economy's long-term capacity to develop while having regard to environmental aspects (Elkington, 1994). In the author's opinion the concept of SD is a subject to constant changes as are the goals of SD which keep evolving significantly as well. It is important to underline that in the latter the concept of development is treated as a comprehensive paradigm having its direct impact on the holistic quality of life of the world's society. Agenda 2030 has been an attempt to achieve integrated development⁶ indicating that no matter how advanced the technology is it has to be ensured that technological change makes a real contribution to developing a more sustainable economy, easing our lives and enhancing the fundamental values of societies such as freedom of expression, the rule of law and privacy.

⁶ 2030 Agenda is a new plan of action for people, planet and prosperity which emphasizes a "world free of poverty, hunger, disease and...free of fear and violence...with equitable and universal access to quality education, health care and social protection...to safe drinking water and sanitation...where food is sufficient, safe, affordable and nutritious...where habits are safe, resilient and sustainable...and where there is universal access to affordable, reliable and sustainable energy" (*Transforming our world*, 2015).

Agenda 2030 adopted seventeen objectives which focused on economic growth, social development, and environmental protection, named SDGs as universal, not only because they concern both developing and developed countries, but also because their focus has changed from competitiveness to sustainability. The new framework (including the “no one will be left behind” principle) finally makes it clear that development means much more than economic growth measured in terms of GDP. Sustainability means much more than environmental compatibility. Inequality means much more than fair income or wealth distribution.

SDGs are “universal” also in the sense that they apply to all nations and all people within those nations. They are “holistic” as all seventeen SDGs can be achieved simultaneously. The universality of the SDGs is unique, not only in establishing a moral standard for social inclusion and the right to a decent livelihood for all, but also in underscoring the obligation of all nations to collaborate on meeting global environmental targets. Bexell and Jonsson (2017) argue that, in spite of cosmopolitan aspirations Agenda 2030 remains state-centric, with great room for state sovereignty and national self-regulation. The 2030 Agenda emphasizes also that human, economic, social and environmental development must be underpinned by good, interconnected and integrated governance at all levels which is crucial for governing the whole process (Stone, 2017). Despite the arguments to the contrary it is considered that a new Agenda calls for a new cooperative paradigm based on the concept of “full global partnership,” often called the fourth pillar of SD, as the transition of the SD concept requires the involvement of different stakeholders based on the participatory rules (Boas, Biermann, & Kanie, 2016).

Each of the seventeen SDGs should thus contribute to four goals: prosperity, social inclusion, environmental sustainability and inclusive governance. Equally important elements of Agenda 2030 are science, technology and innovation. Miedzinski and others (2020); Matusiak, Stancova, Dosso, Daniels and Miedzinski (2020) assess this factor as key tools for moving the world onto a sustainable path and allowing for improvement in its economic and environmental efficiency through more sustainable methods of meeting human needs. Science, technology and innovation, referred to as STI in the UN and OECD documents, are not only considered to be a set of universal, key factors in productivity growth and as leverage for long-term economic growth and welfare (OECD, 2015), but are also essential components for maintaining environmental balance and SD. From the perspective of SDG and the new agenda STI plays an even more important role since it is firmly rooted in several SDGs. For example, in SDGs No. 9 and 17.⁷ STI is crucial for reducing the costs of transfor-

⁷ SDG's 9 aim is to: “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation” while SDG 17 is to: “Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development” (target 17.7.: Promote the

mation and improving the labour market. Therefore it should be introduced where and when it stimulates economic and social transformation and should be seen as a common objective for the private and public sectors (Bainbridge & Roco, 2016, pp. 23–35). Many SDGs point out that SD may utilize STI as a tool for international cooperation particularly in international science and sharing innovation creativity technologies and mechanisms (objectives 17.6–17.8), as well as data and measurement analysis (objectives 17.18 and 17.19).

The scope of the SDGs provides the EU and its Member States with a wide range of opportunities to implement these plans as there are a number of recent and forthcoming policies and initiatives, including DSM, which set new standards for the future and address several of the systemic challenges. The DSM technology alone is not enough to put the EU on the path to SD. Damioli & Vértesy (2020) underline that it just should be used to empower people in their activities including education, jobs and better access to public goods. To achieve this aim the EU priorities and policies must be coordinated and interconnected with the SDGs. The analysis of the current EU priorities with the range of all seventeen SDGs underline (see Table 1) that all the EU priorities are strongly interconnected with SDGs. An “X” indicates that the correlation is very strong while an X in parentheses, “(X)”, indicates that it is not that strong but that if given priority, there can be positive effects on the implementation of the indicated SDGs by the EU.

For the digital revolution to play a positive role in deliberately and constructively supporting the SD agenda within EU society it too must operate within the preconditions and aims of prosperity, social inclusion, inclusive governance and environmental challenges (Hák et al., 2016). Table 1 demonstrates that the interconnection between EU priorities and the SDGs is fully supported by EU policy and must be fully integrated with overarching and sectoral strategies, including the DSM, as it is essential to implement SD in the EU. This is expected on the basis of the EC priorities adopted for the years 2019–2024 and the structure of the Horizon Europe budget. This approach not only contributes to placing the EU in a global leadership role when it comes to SD but also reduces the innovation gap relative to its main competitors (Damioli & Vértesy, 2020, pp. 22–26). The progress could not be made without the DSM being a framework for implementing the above-mentioned actions.

development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed; 17.8.: Fully operationalize the technology bank and science, technology and innovation capacity building mechanism for least developed countries by 2017 and enhance the use of enabling technology in particular information and communications technology), for more details see: <https://sdgs.un.org/sites/default/files/publications/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (accessed 12.01.2021).

Table 1. The EC priorities for 2019–2024 interconnectivity with SDGs

EC priorities	SDGs*																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
European Green Deal						(X)	X	X	X		(X)	(X)	X				X
The economy that serves people	X	X	X	(X)	X	(X)	(X)	X	X	X	(X)						X
Digital-age Europe								X	X							X	X
Protection of European lifestyle					X					X						X	
Stronger position of Europe in the world																X	X
New impetus for European democracy					X					X						X	

Source: Compiled by the author based on EC data.

4. The EU's priorities for regulating the DSM

For more than 250 million people in the EU, *Information and Communication Technologies*, and in particular, the Internet, are important tools for business and social activity, including work, play, communication and expressing views freely. The Internet penetrates all areas of life, regardless of geographical location. The ICT sector accounts directly for 5% of European GDP, contributing to overall growth and productivity. The global economy is becoming a digital economy and ICT networks are the backbone of digital product, services, and innovative economy.

The principles of effective digitalization for SD as endorsed by the Economic and Social Council of the United Nations in 2018 indicate the following aims: effective communication and transparency, participation and inclusion of society and other stakeholders, accountability and transparency, effective coordination across units of governments (horizontal integration), technical competency of the bureaucracy, and smart use of technology. Effective use of new technologies is becoming increasingly important. The COVID-19 pandemic has illustrated the power of the digital market in addressing the pandemic and its impacts by facilitating government operations on a daily basis, enabling the dissemination of information, supporting transparency and providing innovative arrangements in sectors such as health and education (The World in 2050, 2019, p. 21). The use of digital technologies is however fraught with issues relating to privacy, the potential for exclusion of certain groups in society, and other risks. Governing the digital transformation is a challenge because the “ship has to be built while being on the sea”. There is not a clear picture of what a digitalized world will look like. As elsewhere simple and digital governance innovations may help in the EU, but they will not be enough unless a complex system of DSM exists.

The European Parliament and Council Directive of 2000 in electronic commerce was a breakthrough in building the DSM in the EU (Directive of the European Parliament and of the Council, 2000). These regulations were followed by the Europe 2020 Strategy (the Strategy) which includes three interrelated priorities: smart development—developing a knowledge and innovation economy, SD—supporting a more resource-efficient and competitive economy, and inclusive development. The Strategy also defined seven flagship initiatives that were linked to the Strategy's priorities. One initiative was the *Digital Agenda for Europe* with all EU citizens having access to high-speed internet connections by the end of 2013. On 6 May 2015, in accordance with the EU Member States positive opinion the European Commission announced a strategy to build a true DSM (European Commission, 2015c) the focal point of which is the citizen, the consumer and the user. The strategy is aimed to develop the EU's digital economy and to build a sustainable future by removing remaining barriers (e.g. of a regulatory nature) in using online services and tools. Due

to these obstacles consumers lose many opportunities. Further, businesses are developing much more slowly as a result of unequal competition with global leaders in the digital economy such as Singapore, Korea, the United States, Finland and Norway (Mărcuț, 2017).

DSM is based on the following three pillars that focus on the implementation of the identified initiatives:

1. **Consumers and entrepreneurs have better access to Internet goods and services across Europe** thanks to the reformation of the rules on cross-border *IoT sales and digital content sales*. This removed barriers and introduced simplified regulations on cross-border online operations, such as:
 - the elimination of unjustified geo-blocking,
 - the modernization of European copyright,
 - the simplification of VAT-related accounts for e-commerce.
2. **Creating appropriate conditions for the development of digital networks and services** requires ultra-fast, secure and reliable infrastructure, content services, adequate legal conditions to support and develop innovation, investment, fair competition.
3. **The development of a European digital economy and a digital society with long-term growth potential** through:
 - building of a data-driven economy based on, among other things, the processing of big data sets and creating the conditions for the development of cloud computing and the Internet of Things,
 - setting priorities of standardization and interoperability of new technologies in areas of crucial importance for the DSM such as 5G wireless connectivity, digitalization of production processes—industry 4.0, data-based services, cloud computing services, cybersecurity and mobile payments,
 - creating e-government based on building a DSM that supports social inclusion (European Parliament, 2017).⁸ and access to third-country digital markets for all European entrepreneurs.

The next step towards DSM was the Tallin Summit which offered a chance to spotlight the latest opportunities of digitization and coherent approaches to challenges brought on by digital transformation and to enhance practical sharing of ideas and lessons among the frontrunners of digital nations in order to find an answer as to how to increase public safety and its sustainability. It follows up with the Digital Europe Program adopted on 4 December 2018 for 2021–2027 which aims to support the digital transformation of societies and economies to guarantee the financing of projects from five areas: supercom-

⁸ According to the European Commission data, by 2025, there may be a shortage of some 825,000 ICT professionals, while at the same time 90% of jobs will require at least basic ICT skills. One EU initiative to better align labour market shortages and demand from the market is to support women in ICT and to recruit more women in digital jobs and to improve their digital skills.

puter calculations, artificial intelligence, cybersecurity, advanced digital skills and the extensive use of digital technologies focusing on the SD as the cross-cutting issue. In 2020 the Special European Council discussed digitalization as one of key pillars for recovery from the COVID-19 pandemic through new forms of sustainable growth and EU resilience such as: fostering the European development of the *next generation of digital technologies*, including supercomputers, quantum computing, blockchain and human-centric artificial intelligence; developing capacities in *strategic digital value chains*, especially micro-processors; accelerating the deployment of *very high capacity and secure network infrastructures*—including fibre and 5G—all over the EU; enhancing the EU's ability to protect itself against *cyber threats*; unleashing the full potential of digital technologies to achieve the EU's ambitious *environmental and climate action objectives*; upgrading digital capacities in *education systems* (Council of the European Union, 2020).

The DSM initiatives have created a platform for long-term changes for the progressive digitalization of the economy and society, creating a business-friendly and innovation-friendly legal, social and financial environment. In the EU Member States this results in the additional economic growth of several hundred billion Euro over the next few years and the creation of new jobs in digital technology such as e-commerce specialists, data strategists, digital technologists and Big Data specialists including scientists. The regulatory framework stimulates and enables digital innovation which in turn allows innovative businesses to scale up their cross-border operations across the EU and increase their ability to compete in the global digital market with other countries, notably the United States and China, by providing technology services for the services and industrial sectors. The business operation relies on digital ecosystems that combine digital infrastructure, hardware, software, applications and data. Sustainable economic and social benefits can be achieved with high-speed Internet (modern telecommunications infrastructure) and interoperable applications, systems and components. Effective interoperability of IT products and services is essential to create a truly digital society. DSM helps European companies sell goods and services across the EU regardless of their location by enabling them to benefit from the European market at large. To make it easier for businesses to scale up their operations any unjustified or disproportionate regulatory and non-regulatory barriers are removed and rules for data ownership, data access or data reuse are made more specific. This being particularly applicable to data generated by sensors and other data collection devices. An ambitious, coherent and consistent standardization policy and the introduction of interoperability standards are also important. The Member States, the EU regions and industry will have an important role to play in supporting the digitalization of business processes.

Currently in the case of DSM, two facts can be observed. The first is that it does not have a closed catalogue of rules, its rules are determined by the legal

acts, which often depend on political will more than the aims of adopted strategies. Thus, the catalogue of rules is constantly growing and evolving just like the DSM itself. Another fact that can be observed is the treatment of the DSM as a kind of remedy for every crisis facing the European Union. The most intense work on the digital strategy follows the crises facing Europe. The 2020 Strategy, in which EU stated that digitization is the only way out of the crisis, was established in response to the 2008 financial crisis. The treatment of digitalization as an economic remedy is also evident in the European Union's current actions in the Covid-19 pandemic. The Extraordinary European Council of October 2020 confirmed that digitalization should be one of the pillars for rebuilding the EU economy.⁹

In 2020 the European Council identified a number of key factors that should be taken into account in the development of further DSM strategies. First of all the European Union should achieve digital sovereignty in its actions. This sovereignty would be manifested in full independence in the creation of its own rules, the autonomy of technological choices and the implementation of cross-border infrastructure. In addition the European Union should be involved in the development of SDGs in the digital market to become a sustainable data-driven economy while respecting the protection of personal data (European Commission, 2020b). The issue of data is inextricably linked to cloud computing technologies, supercomputers, quantum technologies, as well as convergence. Access to digital technologies for every European and access to 5G networks in urban areas should be a standard. However digital transformation should guarantee a high level of cybersecurity and one of the proposals is to facilitate access to electronic evidence. In addition safe electronic identification (e-ID) solutions are necessary to ensure digital security. The digital compass also alluded to demands that had already been raised, i.e. the need to digitize administration. The COVID-19 pandemic has shown that the health care system is not adapted to the digital age. It was also found that during the pandemic the justice system was also partially frozen. Only some of the Member States have implemented a system of online court meetings, electronic communication between the parties to proceedings or the transmission of documents, the use of video tools as part of preparatory actions. Finally the European Council, reiterated that, with the development of digitalization within the European Union, further support for digital education will also be necessary.

⁹ Extraordinary European Council meeting (1 and 2 October 2020)—EUCO Conclusions 13/20. For more see: <https://www.consilium.europa.eu/media/45910/021020-euco-final-conclusions.pdf>. As indicated in the European Council Conclusions, “the Covid-19 pandemic further highlighted the need to accelerate digital transformation in Europe. (...) Building a fully digital single market will provide an internal framework that allows European businesses to grow and expand (...) The EU will remain open to all companies complying with European laws and standards. Digital development must protect our values, fundamental rights and security, and it must also be socially sustainable.”

5. The benefits of DSM—trends and forecasts

The EU Digital Strategy aim is to benefit European citizens, businesses and environment through building a fair, sustainable and competitive digital economy.¹⁰ The completion of the DSM strategy is intended to contribute to the growth of the European economy by more than 260 billion euro per year which will create jobs and transform public services. In addition the increased use of digital technologies should result in an improvement in citizens' access to information, culture and labour markets (European Commission, 2018b).

The full implementation of the planned legislative measures of DSM, corresponds to 1.2% of the EU GDP of 2018 (see Table 1). This not only shows that there are the economic benefits to DSM measures but also that undertaking actions which fully correspond with making the EU economy and society more technologically equipped leads to greater sustainability. To achieve these goals a strong and costly action started in 2016 in the following areas: (1) building a fair, sustainable and competitive digital economy, (2) providing technology that works for people, (3) creating an open, democratic, and sustainable society and (4) making the EU the global leader (COM, 2020). The first two goals underline the necessity to increase access to high-quality data while ensuring that personal and sensitive data is safeguarded. The third goal covers the introduction of regulations which give citizens more control and protection of their data. These aims require uniform regulations on the protection of personal data as crucial for building the DSM which also goes in line with the Nos. 8, 9, 12 and 16 SDGs and their Targets aims with special attention to Targets Nos. 16.7. and 16.10.¹¹

¹⁰ The analysis of the technological environment and trends that exist in the EU are strictly connected with addressing the Digital Economy and Society Index (DESI) which measures the relevant components of digital efficiency in Europe and tracks the evolution of the EU Member States in the area of digital competitiveness (European Commission, 2020a). DESI's great advantage is that feedback can be obtained on the state of development of the digital society, which is an essential tool for monitoring the activities undertaken for building a digital society. It measures the following elements: (1) communication, (2) human capital and digital skills, (3) use of online services by citizens, (4) integration of digital technology in businesses, (5) digital public services, and (6) ICT research and development. According to DESI Report 2020, all EU countries have improved their overall digital efficiency in the last three years. Finland, Sweden, the Netherlands, and Denmark have received the highest ratings and are among the world leaders in digitalization. The UK, Luxembourg, Ireland, Estonia and Belgium are listed next. Unfortunately a large number of EU countries have a long way to go and the EU as a whole needs further improvements in order to compete on the world's digital stage (European Commission, 2020a).

¹¹ As indicated above Agenda covers 17 SDGs and 169 Targets. The SDG8th aim is: "Decent work and economic growth"; SDG 9th: "Industry, Innovation & Infrastructure"; SDG 12th: "Responsible Consumption and Production" and SDG 16th: "Peace, Justice & Strong Institutions". The target 16.7. aim is to: "Ensure responsive, inclusive, participatory and representative decision making at all levels" and the target 16.10.: "Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements", <https://sdgs.un.org/2030agenda> (accessed 12.01.2021).

Table 2. Estimated annual benefits of selected legal instruments adopted or proposed during the 8th Legislature (2014–2019) (billions of 2018 euro) when fully implemented

Measure	Annual benefits achievable based on measures already finished or in progress	Annual benefits achievable with new measures
E-commerce, content and online platforms	14.6	36.4
Regulation addressing unjustified geo-blocking (2018)	10.3	31.4
Council Regulation and Directive VAT fore-Commerce (2018)	2.3	-
Regulation on cross-border parcel delivery services (2018)	1.0	5.0
Directive Audio-Visual and Media Services (2018)	1.0	-
Data and AI	51.6	-
Directive on the re-use of public sector information (recast) – P2018	45.0	-
Regulation on Free flow of non-personal data (2018)	4.3	-
General Data Protection Regulation (2016)	2.3	-
Trust and security	4.0	-
Directive on Network Information Security (2016)	4.0	-
E-Government	20.0	-
Regulation establishing a Single Digital Gateway (2018)	20.0	-
Consumer protection	0.3	5.9
Directive on contracts for the supply of digital content – P2015	0.3	5.9
Electronic communications networks and services	86.1	41.0
Directive on European Electronic Communications Code (2018)	81.1	41.0
Regulation Open Internet / TSM (2015)	5.0	-
Total:	176.6	83.7

Source: (Scott et al., 2019, p. 10, after Bruegel estimates).

To meet this obligations the General Data Protection Regulations applicable to natural persons (including children), whatever their nationality or residence, in connection with their professional or commercial activities, entered into force in the EU on 25 May 2018. In addition to increase the protection of end-user devices such as computers, telephones, smartphones, or tablets from excessive interference in their privacy in 2018 the Directive 2002/58/EC was superseded by the regulation entitled the Commission's ePrivacy Proposal (Mărcuț, 2019). Under the new directive, prior to having access to data such as photos, contact lists, calendars, or saving information such as persistent cookies that are used to monitor online behaviour, device user consent must be obtained (Krämer, Senellart, & de Streel, 2020, p. 14). The DSM Copyright Directive, procedure 2016/0280 (COD), systematizes the information which is not considered online content-sharing services within the meaning of this directive. It governs the use of content protected by service providers and the online sharing of content only while complying with the principle of filtering content for copyright. In such a case platforms should sign licenses with owners of content protected by copyright. Otherwise it will have to remove the content specified by the holder of the rights. In the case of any accusations for posting illegal content start-ups will be subject to milder restrictions than the Internet companies already operating for years if they operate for less than three years and have an annual turnover of less than 10 million euro. Further, if the monthly average number of individual visitors to these service providers does not exceed 5 million in the previous calendar year, Member States will adopt the laws, regulation, and administrative provisions necessary to comply with them no later than in twenty-four months from its entry into force, which is expected to be in May 2021. These directives are strictly connected with the European Electronic Community Code (EECC) (Directive (EU) 2018/1972) the implementation of which is expected to give the most benefits within the DSM, in direct and indirect terms and which fully address Nos. 3, 4, 9 and 11 SDGs through meeting their goals (*Transforming our world*, 2015).

Information Technology (IT) represents a revision of the entire EU regulatory framework for the telecommunications sector (European Commission, 2018a). The electronic communications sector had seen rapid development in the ten years since the previous European regulatory framework was established including the emergence of Over the Top (OTT) players to challenge the traditional telecommunications market, increased demand for connectivity globally requiring an increase in High Capacity Networks (HCN), and the development of next generation mobile connectivity (such as 5G) (de Streel, 2019, p. 2). The key achievements therefore include: (1) reducing the costs of roaming calls, (2) harmonization of the 700 MHz band and enabling the deployment of 5G technology in Europe by 2021 (in January 2017, the Commission issued a mandate to the European Conference of Postal and Telecommunications Administrations (CEPT) to develop the technical conditions for the use of 5G

frequency bands), (3) the Digitalized European Industry (DEI) package, expected to activate the introduction of digital business models in key sectors such as automotive, healthcare, media, smart factories, and power and (4) implementing measures to simplify *value-added tax* (VAT) rules for eCommerce, Directive 2006/112/EC. The common system of VAT has established: (1) new rules allowing companies that sell goods online to take care of all their VAT obligations in the EU through a digital online portal hosted by their own tax administration and in their own language, (2) furnishing the support for startups and micro-businesses by introducing a yearly VAT threshold of 10,000 euro under which online companies cross-border sales are treated as domestic sales with the VAT to be paid to national tax administration, (3) removal of the current exemption from VAT for imports of small consignments from outside the EU, which leads to unfair competition and distortion for EU companies, (4) amend existing VAT regulations to allow Member States to apply for the same VAT rate to e-publications such as e-books and online newspapers as is applied to their printed counterparts. Member States and citizens will also be positively affected by the additional VAT revenues of nearly 7 billion euro annually and increased access to a more competitive EU market. These new rules will have a major effect for companies selling goods and services online that benefit from fairer rules, lower compliance costs, and reduced administrative burdens moving EU towards a more sustainable economy and society (Giffi, 2019, pp. 137–145; Jeydling, 2019, p. 3).

Conclusions

Digitalization substantially reframes the dynamics of growth and significantly reshapes the course of economic and social SD in the current world, including the EU. Digital exclusion is commonly cited as a major contemporary obstacle to development although digital inclusion on disadvantageous terms, such as high cost of access to connectivity, can perpetuate and even deepen poverty (DEF, 2016). No matter, it can have far-reaching consequences for SD (Scholte & Söderbaum, 2017). The dynamic development of technologies at the regulatory level and in the implementation process, both in the EU and in its Member States, also have problems with satisfactorily meeting the new ICT solutions in a rapidly changing environment. This creates a number of risks including in particular the implementation of the Agenda 2030 goals. But no matter what the pros and cons the process of building the DSM in the EU is strongly correlated with SD and has an important effect on EU and its Member States' economy and society. Numerous legislative measures on DSM have been introduced up to now and most of them have been interconnected and cross-cutting with many SDGs indicated above. According to the planned content of the EU Digital Compass DSM plays a leading role in increasing EU sustain-

able, competitive and inclusive growth under the current situation in regards to pandemia as well as the economic and social challenges. In considering the economy the main regulatory and implementation activities for sustainability within the DSM in the near future should focus on: (1) ensuring fair competition of all companies in Europe, (2) developing digital standards and promoting them internationally, (3) using technology to help EU become climate-neutral by 2050, (4) and reducing the digital sector's carbon emissions. When considering EU society such actions should concentrate on: (1) investing in digital skills for all Europeans, (2) protecting people from cyber threats, (3) ensuring artificial intelligence is developed in ways respecting individual rights, (4) expanding Europe's super-computing capacity to develop innovative solutions for medicine and (5) enhancing transportation, education and the environment.

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