

# Sustainability Concept in the Digital Age: New Opportunities for Companies

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**Abstract.** Sustainability and digitalization are two of the most powerful phenomena of recent times. The phenomena of digitalization and sustainable development are each separately massively explored, but their intersection is subject only to a few of undertaken researches. The paper aims to expand existing sustainability research by incorporating the current digital environment. In particular, the paper explores the relationship between sustainability and digitalization and maps the potential of digitalization benefits for sustainability issue of companies on the base of conducted literature review and content analysis of published researches in this field. As the results shown, digitalization brings new opportunities and challenges in the management of organizations, as well as the fulfilment of their sustainability strategy. It is time to rethink the concept of sustainability and update it in the light of the development of digitalization. Digitalization is becoming an essential part of business.

## 1 Introduction

The first decades of the 21st century are characterized by turbulent changes, high interconnectedness of individual economic entities (consumers, businesses, countries and international unions) due to the ongoing process of globalization, which also brings with it an increased competitive environment. For businesses being able to endure and if possible to thrive in such environment, it is vital not only to accomplish their strategic goals, but also to deal with pitfalls and vice versa to exploit the potential of current phenomena. Sustainability and digitalization are two of the most powerful phenomena of today's business environment.

Sustainability and increasing pressure on organizations to manage not only their economic but also environmental and social performance and to inform all stakeholders of the impact of their activities on the environment has risen considerably over the last few years. Several researches have shown that sustainable activities have a significant impact on business performance [1, 2, 3].

At the same time, the development of technology occurs and digital technologies have a major impact on the development of the whole society, the economy of individual countries

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and individual economic subjects. We are spoken about the digital economy that is seen as a resource for maintaining competitiveness, economic growth and development. Thanks to the massive and global advent of new technologies, value chains are changing and innovative business models are arising. The newly created business models are based on the usage of resources in smart, disruptive and also sustainable ways [4, 5].

There is a significant amount of studies about how sustainability and digitalization are changing management practice, business and even the society. However, both trends are usually examined separately. Far less attention is paid to understanding how these trends combine to create new market and business conditions [6, 7]. There are some analyses of the relationship between sustainability and digitalization [8, 9, 10], but there are not many of them and they deserve to be deepened.

Therefore, the authors focus their attention on the convergence of these two trends. The paper aims to expand existing sustainability research by incorporating the current digital environment. In particular, the authors are interested in understanding the relationship between sustainability and digitalization and mapping the potential of digitalization benefits for sustainability issue of companies.

## **2 Methods**

In order to fulfil the goal of the paper, first the definition of sustainability and digitalization is given. Furthermore, the authors use the well-known sustainability models, such as the Elkington Tripple Bottom Line model and the Epstein and Buhovac model of sustainable performance implementation and its benefits, which seek to update with regard to the era of digitalization and its challenges and opportunities. The discussion focuses on the potential benefits of implementation sustainable performance when taking into account digitalization. The findings are based on a literature review and content analysis of published researches in the field of digitalization and sustainability.

## **3 Results and Discussion**

### **3.1 Sustainability**

According to Mason [11] the most frequent way to define sustainability is still the definition of the UN Commission on the Environment, which states that sustainability is: „*development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.*“ [12, p. 43]

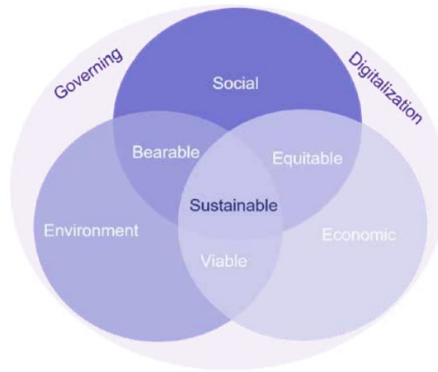
Sustainable development can be viewed from two perspectives. At the micro level, business sustainability can be seen as a business approach to creating long-term value for its owners, through the use of opportunities and the management of risks arising from the economic, social and environmental environment. At the macro level, the essence of sustainable development according to Garza [13] lies in the fulfilment of 3 simultaneous goals:

- maintaining a stable and high level of economic growth and employment;
- in the effective protection of the environment and the prudent use of natural resources;
- and, last but not least, social development that respects the needs of all.

### 3.2 Dimensions of sustainable performance

Sustainable performance according to Elkington [14] consists of 3 main pillars - economic, social and environmental. According to this world famous concept called “The Triple bottom line” the condition of sustainable business performance is met when all the pillars are in equilibrium (see Fig. 1).

In order to achieve a sustainable balance in current business environment, Corporate Governance and Digitalization needs to be added to the core pillars [15]. Corporate Governance, on the one hand, is the way in which an enterprise is managed and, on the other, it is a system of managerial responsibility for corporate governance.



**Fig. 1.** Dimensions of sustainable performance – modified Elkington’s model [15]

At an equilibrium point located at the intersection of all aspects of sustainability, there is an enterprise with suitable governance that achieves excellent economic results and has achieved stable economic growth, all in combination with the environmentally friendly management of natural resources and addressing the needs of all and exploiting the potential of digitalization.

### 3.3 Digitalization

As well as in the theory concerning the very definition of sustainability there is no consensus in the digitalization definition. Vor dem Esche and Hennig.Thurau [16] define digitalization as: *“a major change process with enormous “disruptive power” that effects not only the area of information and communication, but also products, services and distribution channels.”*

The digitalization (also referred to as “digital revolution”) is already reshaping almost every part of private and corporate life thus transforming the society [15, 16]. There are several areas which are identified as the main drivers of digital revolution, for example artificial intelligence, digitalization of information, virtual reality, connectivity and synthetic biology.

In general, there are not only positive changes connected with the digital transformation, but also certain negative effects. Digitalization has positive impacts on energy, resources and carbon productivity, it can lower production costs, dematerialize production and expand access to services and goods. On the other hand, there are job losses concerning mainly the professions where the workers can be easily replaced by AI, deepening the

inequality. The inequality issue reflects the current dominance of technology companies over others – the “big five” and the similar situation in other specific sectors (agricultural, food industry, etc.) which are dominated by single or few companies [16].

### **3.4 Digitalization and sustainability**

The interdependency between sustainability and Industry 4.0 has been confirmed by research of Kamble et al. [17]. Bleicher and Stanley [18] see digitalization as a major driver of growth and sustainability. Heemsbergen [19] argue that digitization has implications for transparency and accountability, which opens up completely new ways of shaping, monitoring, communicating and managing sustainability.

According to Beier et al. [20], Industry 4.0 might offer a great chance to align the aims of digital transformation with sustainable development, however if sustainability aspects are not taken into account, it becomes a threat. One of the biggest challenges for sustainable development is the transformation of industrial production through the digitalization.

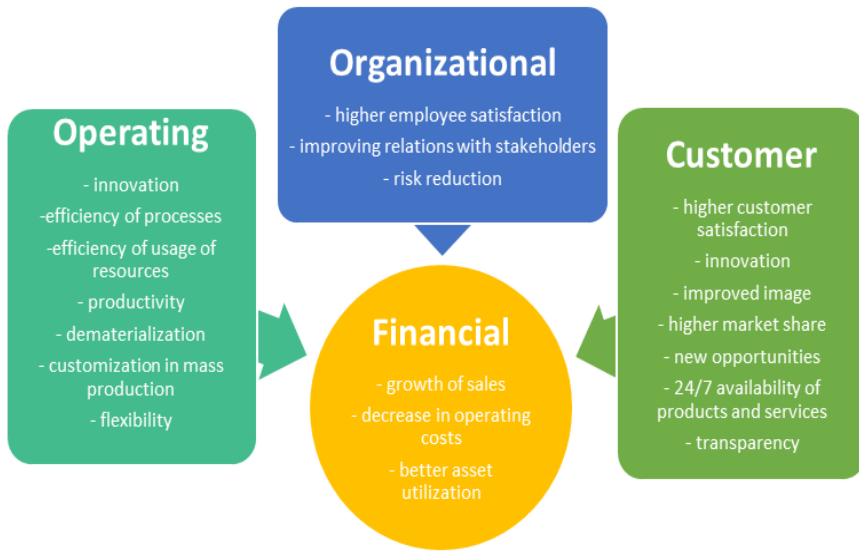
Ordieres-Mére et al. [10] note that due to the insufficient analysis of some relevant dimensions of digitalization and Industry 4.0, it is believed, that digitalization can improve corporate’s environmental performance through the consistent increase of the institutional knowledge of how to perform the sustainable development, mainly when the main aim of actions does not address sustainability.

#### **3.4.1 Benefits of sustainable performance implementation in the digital age**

Epstein and Buhovac [21] set out the reasons why a sustainable performance aspect for businesses is significant. The issue of sustainable business performance has become the subject of regulation by international organizations and, consequently, by individual states. If the company does not incorporate the concept of sustainability into its business and is mandated to do it by law, it is not only threatened by financial penalties, but also by increased costs with additional controls, potential closure of certain manufacturing operations and damage to reputation. Nowadays, the relatively close interconnection of the company with its surroundings provides many opportunities for the company as well as threats. If a company acts in a sustainable manner and takes into account its surroundings, it can, thanks not only to its positive reputation, be more prosperous, for example it can be gaining additional orders or increasing demand from stakeholders for its production. Otherwise, a company not applying sustainability elements in its business faces potential job losses or a decline in production demand. Companies, as well as individuals, have social and moral responsibility for their actions. The company influences its surroundings, whether it is a positive influence (increasing employment, increasing living standards, etc.) or negative (e.g. air pollution). The incorporation of sustainable performance into a business strategy should, when implemented effectively, promote a positive impact on the environment and eliminate or at least reduce the negative impact.

All of the above arguments usually lead to one fact - even if the company spends some financial resources to incorporate the sustainability concept into its business, it should result in greater benefits - whether by avoiding sanctions or other traffic restrictions, or by improving of the company's image and the increased demand for production.

Potential benefits of sustainable performance implementation are quite deeply explored topic, nevertheless the impact of digital revolution on achieving sustainable goals is subject to only few studies. *What could be other potential benefits, if we take into account even the challenges posed by digitalization?* The benefits classified by business area are summarized in Fig. 2.



**Fig. 2.** Potential benefits of sustainable performance implementation combined with digitalization (own processing based on [15, 21, 22])

According to TWI2050 [15] the major transformative impacts of digitalization on production and consumption consist of **dematerialization** and **shared economy**. Dematerialization of goods and services is associated with reduction of resource needs and consumption (energy, raw materials, human capital) and lower carbon emissions. The process of dematerialization is made possible mainly by practically zero marginal costs of transactions, thus better affordability for wider spectrum of customers. The principle of shared economy lies in the real-time matching of demand and supply, thus improved quality of provided services, continuous availability of products and services, and better asset utilization.

Automation of production (using robots and AI in manufacturing process) enables to customize products in mass production and still benefit from economies of scale. Smart automation allows to create flexible manufacturing cells, operating and adjusting automatically based on configurations in production, instead of classical production lines. [22].

With the help of digitalization, the availability of services of all kinds is increasing – for example applications in smartphones or fitness trackers enables individuals to monitor their health conditions in real time and others relatively newly developed tools in telemedicine help to prevent health of employees and reduce work accidents, that might lead to increase in productivity [15].

## 4 Conclusion

Digitalization in the form of big data, artificial intelligence, the internet of things and more brings new opportunities and challenges in the management of organizations, as well as the fulfilment of their sustainability strategy. Companies use new technologies to communicate with stakeholders, map their environmental footprint, reduce emissions and assess the impact of environmental change on their business. New digital technologies also enable sustainable innovation [15].

As the results show, it is no longer possible to separate digital trends from sustainability trends. It is time to rethink the concept of sustainability and update it in the light of the development of digitalization and the potential of this phenomenon. Digitalization is becoming an essential part of business, the strategy of digitalization cannot be separated from the strategy of sustainability if the company wants to be successful, create value and satisfy its stakeholders in the long run.

At the moment, we are at the beginning of our research, focusing on identifying new trends and potentials that digitalization brings. We have conducted a literature review to identify directions for our future research which will focus on the impact of digitalization on sustainable performance of companies in more detail.

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