

DIGITAL TRANSFORMATION IN THE PERSPECTIVE OF THE UNITED NATIONS 2030 SUSTAINABLE DEVELOPMENT GOALS

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ABSTRACT

Developments in technology have transformed every area of life in various ways throughout history. Industrial revolutions have also affected all areas of social life and Industrial revolutions were the turning points of the world economy and industrial life. The Fourth Industrial Revolution, also called Industry 4.0 is a digital transformation process. Digital transformation influence and transform the economies. The concept of digital transformation brings new concepts such as digital sustainability to the agenda. The aim of this study is to evaluate the effects of digital transformation on the economy and sustainable development. For this purpose, the concept of digital transformation has been researched in the perspective of the United Nations 2030 Sustainable Development Goals. Methodically, first of all, a literature review was conducted. The literature findings indicates that awareness is increasing on this subject. In this context, results of this study show that digital transformation is a process of change that has a positive connection with sustainable development.

Keywords: Industry 4.0, Digital Transformation, Digital Sustainability, Sustainable Development.

Research Field: Business Administration

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BİRLEŞMİŞ MİLLETLER 2030 SÜRDÜRÜLEBİLİR KALKINMA HEDEFLERİ PERSPEKTİFİNDE DİJİTAL DÖNÜŞÜM

ÖZ

Teknolojide yaşanan gelişmeler, tarih boyunca hayatın her alanını çeşitli şekillerde dönüştürmüştür. Sanayi devrimleri de toplumsal hayatın tüm alanlarını etkisi altına almış ve dünya ekonomi ve sanayi hayatının dönüm noktaları olmuştur. Endüstri 4.0 olarak da ifade edilen Dördüncü Sanayi Devrimi, bir dijital dönüşüm sürecini ifade etmektedir. Dijital dönüşüm, ekonomileri etkilemekte ve dönüştürmektedir. Dijital dönüşüm kavramı beraberinde dijital sürdürülebilirlik gibi yeni kavramları da gündeme getirmektedir. Bu çalışmanın amacı, dijital dönüşümün ekonomiye ve sürdürülebilir kalkınmaya etkilerini değerlendirmektir. Bu amaçla, dijital dönüşüm kavramı Birleşmiş Milletler 2030 Sürdürülebilir Kalkınma Hedefleri perspektifinde araştırılmıştır. Yöntemsel olarak, öncelikle literatür taraması yapılmıştır. Literatür bulguları, konuya ilişkin farkındalığın artmakta olduğuna işaret etmektedir. Bu bağlamda, çalışmanın sonuçları dijital dönüşümün sürdürülebilir kalkınma ile aoulumlu bağlantısı olan bir değişim süreci olduğunu göstermektedir.

Anahtar Kelimeler: Keywords, Keywords, Keywords.

Araştırma Alanı: İşletme Yönetimi

Araştırma Türü: İnceleme

JEL Kodları: M13, Q01

1. INTRODUCTION

As industrialization increased, the scope of environmental pollution also expanded. Population growth has also had a negative impact on the ecosystem and the environment. Thus, environmental problems and climate

change have emerged as issues that threaten our global existence and need to be resolved.

Climate change and environmental problems have been the subjects that scientists have drawn attention and sought solutions for years. The search for solutions to ecological problems has added a new dimension to growth and development dynamics. At this point, sustainable development has brought a new dimension to the generally accepted phenomenon of development.

Sustainable development is a normative value system and provides a universal framework for development. Sustainable development was defined for the first time in United Nations "Our Common Future Report" in the 1987. According to this Report, sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p. 41).

There have been important developments in the process leading to the United Nations 2030 Sustainable Development Goals. The United Nations 2030 Sustainable Development Goals include more comprehensive targets compared to previous periods. Along with the Goals, the digital transformation process has been more concentrated.

It is possible to meet the digital needs of present and future generations by ensuring the sustainability of digital products. The sustainability of digital products is realized through the adoption of digital technologies. One of the concepts most affected by the development of digital technologies is the concept of sustainability.

Unlimited access and reuse of digital products is essential for digital sustainability. Digital sustainability will be achieved by achieving maximum access to digital products and using them again. Ensuring digital sustainability requires consideration of digital products and ecosystem related conditions.

Setting digital sustainability as a goal creates many opportunities worldwide. In a rapidly digitalizing world, the assimilation and sustainability of digital transformation creates great opportunities for businesses. The path followed by each business in the digital transformation process is different. To ensure digital sustainability businesses need to make strategic planning in the short, medium and long term. With an empowered workforce leading the way, big gains can be the result.

Businesses that successfully implement the digital sustainability can get ahead of their competitors. Businesses that cannot keep up with the digital transformation are in danger of extinction. Therefore, it is necessary to invest in digital technologies in order to achieve sustainable development goals and global competitiveness. Sustainability and productivity do not contradict each other when enabled by Fourth Industrial Revolution technologies.

Based on these findings, the aim of this study is to draw a conceptual framework for sustainable digital transformation in line with the United Nations 2030 Sustainable Development Goals with an approach based on digital technologies. In this context, the digital transformation process and the idea

of industry 4.0 are examined in detail. Afterwards, the effects of digital transformation on the economy were evaluated in terms of sustainability.

Finally, the concept of digital sustainability has been explained within the framework of the United Nations Sustainable Development Goals. This study focused on the digital transformation process that emerged with the compliance with the United Nations 2030 Sustainable Development Goals.

2. DIGITAL TRANSFORMATION AND INDUSTRY 4.0

When the sources about digital transformation are examined, it is seen that digital transformation is a concept that emerged with Industry 4.0. (Klein, 2020b, p. 25). Industry 4.0 refers to the 4th Industrial Revolution.

Throughout history, revolutions have occurred where new technologies cause changes in economic systems and social structures. (Schwab, 2017, p. 6). Three major industrial revolutions took place in the period from the 18th century to the 21st century. The period we are in is the Fourth Industrial Revolution.

- The First Industrial Revolution began in England in the second half of the 18th century (1712). With the 1st Industrial Revolution, mechanization began and the necessary power sources for the industry were discovered.
- The Second Industrial Revolution is called the Technological Revolution. It started in the last quarter of the 19th century and continued until the beginning of the 20th century. While the 1st Industrial Revolution was characterized by transition from an agricultural economy to an industrial economy, the 2nd industrial revolution covered from water and steam power to electric power (Adebanjo et al., 2020, p. 4).
- The Third Industrial Revolution is called Industry 3.0. It covers the period from the 1970s to 2010 after the Second World War. The foundations of the Third Industrial Revolution were laid with digital technological developments. It is the period when electronics and information technologies are integrated into production. The 3rd Industrial Revolution refers to the use of electronics and information technologies as a result of digitalization in production. The 3rd Industrial Revolution ushered in the age of the internet and computing power (Adebanjo et al., 2020, p. 4).
- The Fourth Industrial Revolution we are in has been developing in the global economy for many years. Industry 4.0 has emerged as a predicted outcome of the previous industrial revolutions (Pereira and Romero, 2017, p. 1208). The 4th Industrial Revolution is the change in the dimension of digitalization, which is the starting point of the 3rd Industrial Revolution.

The 4th Industrial Revolution is the revolution based on the digital revolution and includes artificial intelligence. The 4th Industrial Revolution, also called Industry 4.0, is a digital transformation process that is still ongoing today.

There is no agreed definition of what Industry 4.0 is. The term Industry 4.0 was first used at the Hannover Fair in 2011. The Fourth Industrial Revolution

or Industry 4.0, whose foundations were laid in Germany in 2011, is a period that is still ongoing today and continues to develop rapidly.

Production systems is based on digitalization and technology in the Fourth Industrial Revolution. The Industry 4.0 is associated with a number of new and innovative technologies (Brodny and Tutak, 2022, p. 20).

The basic technologies related to the Industry 4.0 are presented in Figure 1.

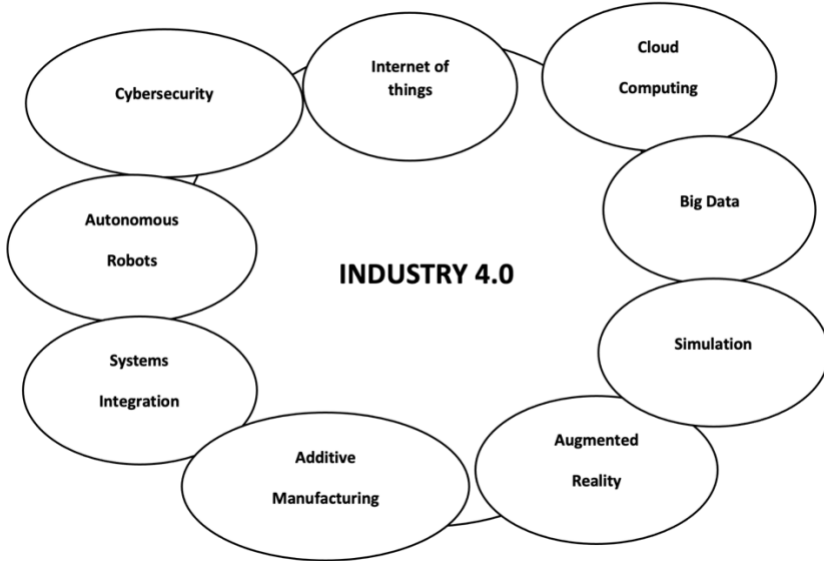


Figure 1. Basic Industry 4.0 Technologies

Source: *Brodny and Tutak, 2022, p. 4.*

Industry 4.0 is not a completed process yet. The process of digital transformation that has been going on for many years is closely connected to the idea of Industry 4.0. Therefore, it is impossible to consider the digitalization process independently of Industry 4.0.

Digitalization, which started with the development of computers in the 1970s, has now moved to a different dimension under the name of digital transformation. Societies have found themselves in a rapid change from production to trade, from education to lifestyle.

The concept of digitalization means that our work is easier, more accurate, better is the process of digitalizing everything that will enable it to be made and accessible (Saracel and Aksoy, 2021, p. 348). Digitalization, which is the basis of the Third Industrial Revolution, has changed dimensions. In parallel with this revolution, the digital transformation process has begun.

A digital transformation that emerged with the concept of Industry 4.0, which expresses the 4th Industrial Revolution we are in, and affects both the economic, public and social areas as well as personal lives is on the agenda

(Klein, 2020a, p. 998). Industry 4.0 affects all areas of social life and forces digital transformation in almost every area of life.

Digital transformation is an evolutionary process that enables new business models, business processes and customer experience to create value with the power of digital technologies and competencies (Morakanyane et al., 2017, p. 4). Digital transformation starts with the consumer, not just with technology. Managers expect digitalization to positively affect the environmental dimension of sustainable development in Industry 4.0. (Niehoff and Beier, 2018).

The digital transformation process should be considered as a strategic change management issue. The foundation of digital transformation is the flexibility to make radical changes in business models instead of writing a business plan. Therefore, when developing a new business, a business model-centered approach is adopted not a business plan (Ertemel, 2021, p. 43). That can be accomplished largely with digital technologies.

Digital transformation, which is rapidly advancing with new digital technologies, also changes economic conditions and expectations.

3. THE IMPACT OF DIGITAL TRANSFORMATION ON ECONOMY

Technology is one of the primary factors affecting economic growth. The development of technologies are increasingly driving the economic growth. The opportunity to access all kinds of data regardless of time and place brings the expectation of growth of the economy and increase in productivity (Schwab, 2017, p. 16).

The use of digital technologies also contributes to changing the social and economic structure. Therefore, digital economy is based on digital technologies. The digital economy highlights the efficient and widespread use of digital technologies in the conditions of global competition. The fact that digitalization creates profound changes in the economy also causes the digital economy to be defined as an innovative and disruptive economy.

Digital technologies are seen as a critical enabler to achieve United Nations 2030 Sustainable Development Goals in many different sectors. Digital technologies provide productivity gains in many different sectors from automotive to textile. The biggest source of economic impact is productivity gains. Efficiency provides competitive advantage.

Apart from this, the other factor that strengthens the economic effect is the speed of the spread of digital technologies. Adaptation to the speed of the spread of digital technologies provides economic benefits.

The development of digital technologies has caused enormous changes in the activities of businesses. It is critical that digital sustainable, environmentally friendly, innovative strategies are aware and developed, and that businesses integrate these strategies into their corporate strategies.

Digital transformation in businesses started with the use of digital technologies within the business, in other words, with the digitalization process (Klein,

2020a, p. 999). Investing in technology does not mean digital transformation. Technology is the driver of digital transformation. The purpose is to reorganize and reshape the business.

Digital transformation as a complex and disruptive process needs an integrative digital transformation strategy comprising all fields of businesses undergoing the transformation. Digital transformation is the most pervasive phase, one that leads to the emergence of entirely new business models based on radically novel logics to create and capture value (Iansiti and Lakhani, 2017). Businesses need digital transformation to move their vision forward and stay competitive in market conditions. Businesses that play a leading role in this process undergo significant changes in their organization and working structures.

Digital transformation means the implementation of technology projects, the restructuring of processes, the reorganization of the organizational structure and the field of work. Digital transformation in businesses has many different areas and dimensions. In businesses, digital transformation happens in areas such as products, services, consumer experience, value chains, business processes.

Digital transformation influence and transform the whole organization, operation and even the corporate culture of businesses. Digital transformation refers to the use of new digital technologies such as Artificial Intelligence, Big Data and Social Media in business processes, going beyond the use of computers or the internet in business functions. Digital transformation enables the sharing of information at near-zero marginal cost, and digital networks are spreading rapidly (Iansiti and Lakhani, 2017).

The Artificial Intelligence, which has gained momentum in the last ten years, creates serious advantage areas as well as threats it brings. Businesses were proactively prepared for the transformational potential of this opportunity by defining in advance the most suitable business models (Pereira and Romero, 2017, p. 1211).

The reasons why businesses resort to digital transformation are to move the business vision forward, to stay competitive, to increase market conditions and productivity.

With digital transformation, businesses can increase their competitiveness and will be able to achieve new gains in many areas. Digital transformation enables to reduce operating costs, improve product quality and gain strategic advantages. Digital transformation provides great potential to increase productivity and efficiency in businesses.

The expectations of the businesses from the digital transformation process vary according to the sectors and the competitive situation. However, the basic and common expectations can be listed as follows (Kökhan, 2021, p. 98):

- Reducing costs
- Creation of efficient business models
- Reducing errors within the system

There are different definitions in the literature about digital transformation in businesses. When it comes to digital transformation in businesses, the first area of transformation that comes to mind is the transformation of business models. However, businesses not only digitalize their products and business models, but also adapt to new business models by digitalizing their processes (Burmeister, et. al., 2016, p. 127). The important thing is to think innovatively and to generalize the R&D culture.

Digital transformation transforms many things from business models to revenue streams, from operational processes to consumer relations, from the services offered to much more. Digital transformation plays a key role in developing and successfully maintaining digital business models based on sustainable development.

Businesses are designing all the building blocks in their business models to deliver more value. Existing business models are transformed by digitalization, new business models are emerging and as a result, the value chains and organizations of businesses require different structures.

Digital transformation begins with the consumer. The focus is on the demands and expectations of consumers. In particular, the demands and expectations of consumers are changing and accordingly, significant changes occur in business models.

At this point, it is important for businesses to interact proactively with consumers. Because consumers are the reason for the existence of businesses.

Expectations, experiences and purchasing behaviors of consumers affect the success of businesses. Digital transformation has also changed the definition of consumer. More personal products and services have started to be produced with the digital transformation. In short, the main goal in digital transformation is the transformation that focuses on the consumer rather than the digitalization of the process.

In the digital ecosystem we are in, different sustainable business models that have emerged in recent years are suggested. In addition to business models getting value with personalized products, ecosystem partnerships formed by many different companies become widespread and increase the competition in the market.

According to Schwab (2017), businesses that have successfully completed digital transformation will be businesses that can deliver higher quality and cheaper products to consumers faster. Accurate and timely implementation of new strategies in the digital transformation process will provide competitive advantages to businesses. It is important to choose the right digital

technologies at the right time and to be prepared for different risk situations that may arise.

There is a transformation in traditional sectors with digital transformation. According to researches, digital transformation affects the “health, banking and education” sectors the most.

Banking sector, one of the sectors, which realizes digitalization in the best way and provides economic savings. Digital banking is not just the transfer of banking activities to the virtual space. The banking sector is reshaping its relationships with its consumers and employees through digital transformation.

According to a study by McKinsey, only 8 percent of companies think that the pace of digital transformation will make their current business model economically sustainable. The remaining 92 percent state that the ability to change and flexibility gained through digital transformation is the only way to keep their operations competitive. (Harvard Business Review [HBR] Türkiye, 2021).

While demonstrating the economic necessity of transformation, can also be said, not only the last industrial revolution, but also all of the industrial revolutions were carried out with the expectation of gaining economic advantages.

The impact of digital transformation on productivity growth and economic growth has been positive. In the 21st century, growth dynamics have changed and digital transformation has become one of the main elements of competition.

Setting sustainability as a goal through digital transformation creates worldwide many economic opportunities. The growth rate of the digital transformation in the world is higher than the Global Gross Product. It is necessary to take precautions against the different risks brought about by digital transformation and to increase awareness.

The economic effects of digital transformation become evident in the dynamism of the process. The effects of digital transformation on economic life are being evaluated in terms of production, employment and foreign trade.

- The main impact of digital transformation in terms of production is new production technologies. Transformation changes both the production processes and the product. Digital transformation in production will save resources and reduce ecological destruction. The opportunities offered by the technological development will be able to reduce the damage caused by the production process to the environment.
- The effects of the digital transformation process on employment are that new job opportunities will emerge. However, following advances in technology the unemployment process may occur. On the one hand, it will cause job losses, it also causes of new professions involving digital competencies and the

emergence of new job opportunities. In economic science, it is called technological unemployment.

- Foreign trade is the most important foreign exchange income and expense item of a country. Therefore, digital transformation will change the products and services traded.

Digital transformation is the business model in which changes are driven by the application of digital technologies in the entire field of the economy. For countries, it is impossible to stay out of the process, adaptation to the transformation will be achieved with sector-oriented strategies and policies.

In the digital transformation process, it is necessary to identify the gaps in the ecosystem and to design and implement the tools to fill those gaps. It is important to complete the missing infrastructure and accelerate the process with innovation.

What matters most in this transformation is how sustainability is affected by digitalization. Continuous digital transformation in the future is possible with the provision of digital sustainability. In order to ensure digital sustainability, high-tech production should be supported by human capital investments.

4. DIGITAL SUSTAINABILITY

The concept of sustainability, in its simplest sense, is defined as “the ability of something to remain undecreased for a certain period of time” (İş Dünyası ve Sürdürülebilir Kalkınma Derneği [SKD] Türkiye, 2020, p. 4). Sustainability emerged as an official concept for the first time in the 18th century. The concept of sustainability has become increasingly important due to the depletion of natural resources in the world and climate change.

The concept of digital is the way modern computers process information. Digitalization is the conversion of any information from analog format to digital format. As the world agenda moves towards digitalization and the importance of data and the internet, the concept of sustainability has also been affected by these developments.

Today, digitalization has turned into a basic need. Creating, storing, transmission and using of information has become dependent on digital technology. The dynamic development of information and communication technologies has caused significant changes in almost all areas of economic and social life. The digitalization process in the 21st century has an accelerating effect on the creation of sustainable societies.

Digital technologies affect the attitudes and behaviors of current generations, they also affect the lives of future generations. For this reason, the concept of sustainability gains more importance in the digitalization process (Şeker, 2021, p. 371).

The consumption of natural energy resources, monitoring climate change, protecting biodiversity, promoting sustainable development values have drawn attention to the use of strategies related to green technologies by the United Nations (Olena, et. al., 2020, p. 231).

Steps have been taken to emphasize the importance of the interrelation between sustainable development with green and digital technologies. The goal of strengthening in the global arena by making the best use of the opportunities provided by digital technologies has been set. The importance of developing innovative and environmentally friendly digital technologies was emphasized.

The United Nations 2030 Sustainable Development Goals placed sustainability at the center of development. The 17 goals are part of the 2030 Agenda for Sustainable Development. Goals aim to solve the ecological problems encountered on a global scale by 2030.

It has been revealed that the concepts of digitalization, green technologies and sustainability should be considered together with the Goals. Goals associate the development of environmentally friendly technologies with the principle of sustainable development. The targets set by the United Nations 2030 Sustainable Development Goals highlight green and digital technologies that will become an export product (Çayırbaşoğlu and Sakıcı, 2021, p. 1916). In particular, the sustainability policies in the 9th and 17th Goals address how the digitalization process can be managed.

9th Goal: Industry, Innovation and Infrastructure: (United Nations, 2015). Built resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation. There are more than 4 billion people in the world who do not have internet access; in addition, 90% of them are in developing countries. Sustainable development will be made possible by ensuring that everyone has equal access to knowledge and experience. Within the scope of this goal, efforts should be made to significantly increase access to information and communication technologies and to provide access to universal and affordable internet services in less developed countries.

17th Goal: Partnerships for the Goals: (United Nations, 2015). Increasing access to technology and knowledge, accelerating technological and innovative applications, creating a technology platform. In this context, the internet and digital Technologies provide access to knowledge, science, technology and innovation, facilitate and accelerate regional and international cooperation and information sharing and is becoming an increasingly important tool for development.

In the both 9th and 17th goals, the importance given to information and communication technologies is mentioned. It was stated that it is critical to eliminate digital inequality as well as provide equal access to information. The digitalization process resulting from this development is becoming a determinant of sustainability.

At the present time, international political efforts and practices continue to align with the United Nations 2030 Sustainable Development Goals. Strategies are being developed to support this process and facilitate compliance for businesses. Thus, it is aimed that businesses integrate digital technologies into sustainable strategies. At this point, digital technologies are seen as a fundamental part of the sustainability actions of businesses.

Digital technologies are seen as a facilitator to achieve sustainability goals in many different sectors. Therefore, digital technologies are of great importance for today's economy. New technologies need to be balanced with the aim to remain operationally effective and sustainable. Sustainable and efficient business models can be created with digital technologies.

Digital transformation is a strong driver in societies, businesses and science. Digital transformation offers many new opportunities for remote monitoring of air and water pollution or monitoring and optimizing how energy and natural resources are used. (Olena et. al, 2020, p. 234). Digital transformation is a continuous process rather than a one-time action. Ensuring sustainability and increasing profitability can be achieved with digital transformation.

Recently, studies have been carried out on the relationship between sustainability and digitalization. The studies investigating the issue of digitalization and sustainability clearly emphasize the connection between the two concepts. Some of the people working on this issue have put forward a concept they call "Digital Sustainability".

The concept of "Digital Sustainability" came to the fore for the first time in a private company called Born Green Technology, which was established in Switzerland in 2012. The concept of "Digital Sustainability" refers to a holistic approach that a company can adopt to achieve better levels of sustainability through investments in smart technology. Digital sustainability is how technology is used to deliver sustainability.

The importance of digital transformation in terms of sustainability is due to the fact that it has a great share in achieving a dynamic and competitive economy. Sustainable management of digital transformation is of strategic importance for future generations and the future existence of businesses. Digital transformation is recognized as an important tool in achieving sustainable development goals.

4.1. Dimensions of Digital Sustainability

The concept of sustainable development includes more than one dimension. In other words, sustainable development is a concept that has social, ecological, economic, political and cultural dimensions. However, it is generally accepted that sustainable development consists of three main components. These three main dimensions of sustainable development (economic, social and ecological) cannot be considered separately from each other.

The main dimensions of sustainable development are presented in Figure 2.

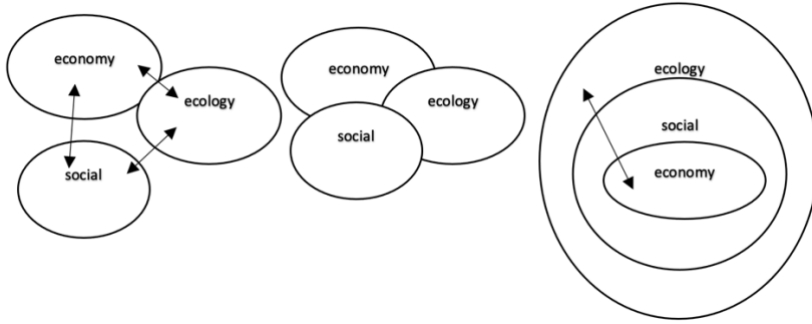


Figure 2. The Main Dimensions of Sustainable Development

Source: *SKD Türkiye, 2020, p. 7.*

- The economic dimension foresees a sustainable system in which the traditional understanding of economic development is changed and excessive consumption of resources is prevented. It is to meet the needs with the resources owned and by considering the resource adequacy of future generations.
- The ecological dimension foresees a system that can manage its resources without harming the environment.
- The social dimension expresses sustainability not only in economic and technological developments, but also in social changes and developments. Social sustainability means ensuring equality both within and between generations.

The economic, social and ecological dimensions of sustainable development are accepted as the dimensions of digital sustainability. By investigating how the interplay between digitalization and sustainability is framed regarding the ecological, economic, and social dimensions of sustainability, we strive to add to the emerging multidisciplinary discussion about how both megatrends have imposed major transitions upon the ways in which different actors imagine the world (Brenner and Hartl, 2021).

According to this view, digital sustainability has economic, social and ecological dimensions. The dimensions of digital sustainability are presented in Figure 3.

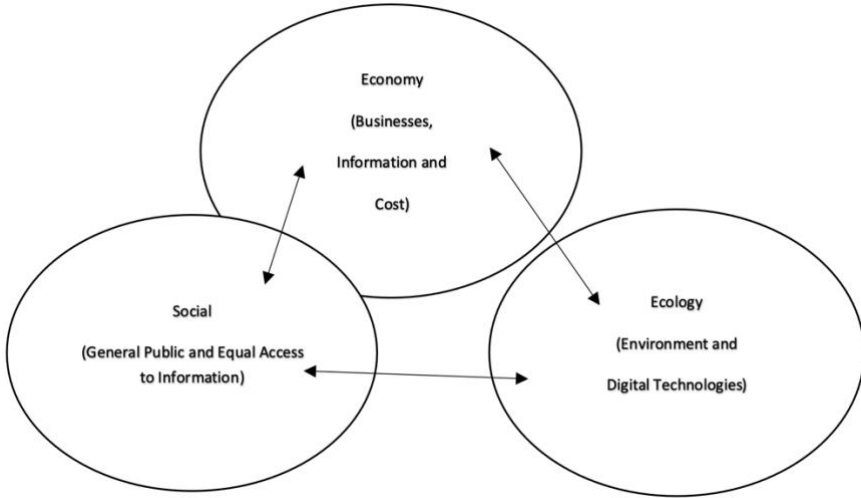


Figure 3. The Dimensions of Digital Sustainability

Source: Figure created by the author

- The goal of the economic dimension of digital sustainability is to provide better, cheaper and easier access to information. This dimension can be measured by reducing direct and indirect costs in terms of user time and efforts.
- One of the elements that digital transformation interacts with is the environment. Reducing the environmental impact of digital transformation refers to its ecological dimension. In other words, the goal of the ecological dimension of digital sustainability is to reduce the harmful effects of digital transformation on the environment. It is the use of digital technologies in an ecologically sustainable way. The increase in energy needs along with digitalization increases greenhouse gas emissions. This dimension can be measured by the reduction in greenhouse gas emissions during the life cycle of digital technologies. (Chowdhury, 2013, p. 605).
- The goal of the social dimension of digital sustainability is to create a better informed society for equal access. One of the most important requirements of the social dimension of digital sustainability is ensuring that individuals have equal access to information in the fields of life. (Chowdhury, 2013, p. 609). Open access to digital information provides more social benefits. This dimension can be measured in terms of the use and impact of information.

The economic dimension is emphasized more than other dimensions. However, these dimensions of digital sustainability are interrelated and none of them can be considered alone. Therefore, all three dimensions must operate simultaneously to ensure digital sustainability. In other words, the basic condition for ensuring digital sustainability is to ensure economic, ecological and social sustainability at the same time.

Digital transformation fundamentally changes the habits of individuals and determines the lifestyle and quality of future generations. Social sustainability

gains a special importance in digital transformation with the beginning of the digital society. According to the social dimension of the digitalization process, it is necessary to minimize the negative effects that will occur on the social structure for present and future generations.

The digital transformation process, in which ecological sustainability is ignored, will cause environmental problems for both present and future generations. Although it will increase the welfare level of countries in the short term, it will create a life without ecological sustainability for future generations in the long term. Therefore, in the digitalization process, ecological and social sustainability should be taken into account as well as the economic dimension of sustainability.

5. CONCLUSION

The concept of sustainable development, first defined by the United Nations in 1987, refers to establishing a balance between human behavior and nature. Our Common Future Report, which defines sustainable development, directly associates the development of environmentally friendly technologies with the principle of sustainable development.

There have been various developments from the years when the definitional content of the sustainable development approach began to fill up. The transition process to the sustainable development approach at the level of the united nations has gained content with embodied texts. Sustainable development has begun to be viewed from a wider perspective with the United Nations 2030 Sustainable Development Goals adopted in 2015. Transition to the new world order is aimed with the United Nations 2030 Sustainable Development Goals.

In addition, the transformation of societies takes place through revolutions. Along with the revolutions, changes are experienced in economic systems and social structures. The digital revolution we are in has begun to change the expectations and habits of societies.

Digital transformation refers to a radical change brought about by digital technologies. In other words, it can also be defined as the changes brought about by digital technologies in the business model of businesses.

In the digital world, businesses need to adopt new business processes and practices to help them compete effectively. Businesses need to use digital technologies to design and implement a consumer-oriented business model. This issue depends on the harmonious functioning of business functions with digital transformation strategies. In the digital transformation process, businesses undergo significant changes in their organization and working structures.

Businesses carry out digital transformation in order to obtain new opportunities and growth potential from technological developments. The long-term contribution of digital transformation to sustainability depends on how digitalization is shared. Due to the fact that digital transformation is a constantly evolving process, its multidimensionality should be considered. In

the digital transformation process, it is important to consider the different dimensions of sustainable development.

Sustainable development is a concept that has social, ecological, economic, political and cultural dimensions. Sustainable development will be possible with the synergetic effect of three dimensions such as economic growth, social equality and environmental protection. These three dimensions are also accepted as dimensions of digital sustainability. Therefore, the interaction between digital sustainability and economic, ecological and social sustainability is of great importance.

The importance of digital transformation in terms of sustainability is due to the fact that it has a large share in the achievement of a dynamic and competitive economy. Digital transformation is seen as a measure of development in the global world. It is stated that digital transformation is one of the most important factors affecting the economy with the United Nations Sustainable Development Goals. This goals cover all countries of the world. The digital transformation process must be integrated into sustainable development strategies in order to achieve the United Nations Sustainable Development Goals.

As a result, there is a significant interaction between digitalization and sustainability, and it is not possible to ignore sustainability in the digital transformation process. Digital transformation is a process of change that has a positive connection with sustainability. Digital transformation is a constantly evolving process and it includes a radical transformation based on sustainability.

Digital transformation will take place with the creation of a sustainable ecosystem. It is necessary to include ecological factors in decision-making processes and create appropriate digital business models.

REFERENCES

- Adebanjo D., Laosirihongthong T., Samaranayake P. & Teh P. L. (2020). Key enablers of industry 4.0 development at firm level: Findings from an emerging economy, *IEEE Transactions on Engineering Management*. <https://doi.org/10.1109/TEM.2020.3046764>.
- Brenner, B. and Hartl, B. (2021). The perceived relationship between digitalization and ecological, economic, and social sustainability, *Journal of Cleaner Production* 315-128128, 2-12.
- Brodny, J. and Tutak M. (2022). Analyzing the Level of Digitalization among the Enterprises of the European Union Member States and Their Impact on Economic Growth, *Journal of Open Innovation: Technology, Market and Complexity*, 8 (2), 70, <https://doi.org/10.3390/joitmc8020070>.
- Burmeister, C., Lüttgens D. and Piller F. T. (2016). Business Model Innovation For Industrie 4.0: Why The Industrial Internet Mandates A New Perspective On Innovation, *Die Unternehmung*, 70 (2), 124 - 152.

- Chowdhury, G. (2013). Sustainability of Digital Information Services, *Journal of Documentation*, 69 (5), 602 - 622, <https://doi.org/10.1108/JD-08-2012-0104>.
- Çayırağası, F. and Sakıcı Ş. (2021). Avrupa Yeşil Mutabakatı (Green Deal) ve Birleşmiş Milletler Sürdürülebilir Kalkınma Hedefleri Perspektifinde Sürdürülebilir Dijital Pazarlama Stratejileri, *Gaziantep University Journal of Social Science*, 20 (4), 1916 - 1937.
- Ertemel, A. V. (2021). *Dijitalleşen Dünyada Yeni İşletme Stratejileri*, İstanbul, İstanbul Ticaret Odası Yönetim Kitaplığı, 2021 - 16.
- Harvard Business Review Türkiye (2021). Dijital Dönüşümün Sektörel Etkileri, <https://hbrturkiye.com/sponsorlu-icerik/dijital-donusumun-sektorel-etkileri>, (Accessed 24 October 2022).
- Iansiti, M. and Lakhani, K.R. (2017). Managing our hub economy - strategy, ethics, and networks in the age of the digital superpowers, *Harvard Business Review*, October- November, 85-92.
- İş Dünyası ve Sürdürülebilir Kalkınma Derneği (SKD) Türkiye (2020). 100 Maddede Sürdürülebilirlik Rehberi, <http://www.skdturkiye.org/yayin>, (Accessed 24 October 2022).
- Klein, M. (2020a). İşletmelerin Dijital Dönüşüm Senaryoları - Kavramsal Bir Model Önerisi, *Elektronik Sosyal Bilimler Dergisi*, 19 (74), 997 - 1019.
- Klein, M. (2020b). İşletmelerde Dijital Dönüşüm ve Etmenleri, *Journal of Business in the Digital Age*, 3 (1), 24 - 35.
- Kökhan, S. (2021). Dijital Dönüşüm Sürecinde Yaşanabilecek Zorluklar, İnci Erdoğan Tarakçı and Bora Göktaş (Ed.), *Dijital Gelecek Dijital Dönüşüm*, 93 – 119, İstanbul, Efe Akademi Yayınları.
- Morakanyane, R., Grace A. and O'Reilly P. (2017). Conceptualizing Digital Transformation in Business Organizations: A Systematic Review of Literature, *In Bled eConference*, June 18 (21), 1 - 14.
- Niehoff, S. and Grisca B. (2018). *Industrie 4.0 and a sustainable development: a short study on the perception and expectations of experts in Germany*, *Int. J. Innovat. Sustain. Dev.* 12 (3), 360–374.
- Olena, B., Vasyl B. and Bogdan B. (2020). Digital marketing components of providing information about energy service companies in the conditions of green energy development, M. Bezpartochnyi (Ed.), *New trends in the economic systems management in the context of modern global challenges: collective monograph*, 231 - 240.
- Pereira, A. C. and Romero F. (2017). A Review of the Meanings and the Implications of the Industry 4.0 Concept, *Procedia Manufacturing*, 13, 1206-1214, <https://doi:10.1016/j.promfg.2017.09.032>.
- Rosati, P., Lynn, T., Kreps, D. and Conboy K. (2024). Digital Sustainability: Key Definitions and Concepts, P. Rosati, T. Lynn, D. Kreps and K.

- Conboy (Ed), *Digital Sustainability: Leveraging Digital Technology to Combat Climate Change*, 1-24.
- Saracel, N. and Aksoy I. (2021). Dijital Sürdürülebilirlik, Boyutları ve Koşulları, *Social Sciences Research Journal*, 10 (2), 347 - 356.
- Schwab, K. (2017). *The Fourth Industrial Revolution*, Founder and Executive Chairman, World Economic Forum, Australia, Portfolio Penguin Group.
- Şeker, A. (2021). Sürdürülebilirlik ve Dijitalleşme, İnci Erdoğan Tarakçı and Bora Göktaş (Ed.), *Dijital Gelecek Dijital Dönüşüm*, İstanbul, Efe Akademi Yayınları, 365 – 385.
- United Nations, *The United Nations 2030 Sustainable Development Goals*, 2015. <https://sdgs.un.org/goals>., (Accessed 24 October 2022).
- World Commission on Environmental and Development (1987). *Our Common Future*, United Nations, Report of the World Commission on Environment and Development.