

# The Financial Aspect of Digital Transformation for Businesses: The Road to Sustainable

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## Abstract

Digital transformation is one of the most popular topics of recent days. Businesses want to gain competitive advantage by digitalizing their processes, increase their market share, increase their efficiency and productivity, and reduce their costs. However, it should not be forgotten that there is a serious cost to be incurred in order to implement digital transformation fully and efficiently. It is important how and where businesses will cover the cost of the investment, they will make to realize digital transformation. In order to implement a successful digital transformation, high quality technology products must be purchased at low costs. At this stage, the finance department of the enterprise should determine what to do and how to overcome this situation with a correct strategic planning. Afterwards, what should be done in order for the investment to be sustainable and to make the expected contribution to the business should be put on the agenda. In this study, the financial dimension of digital transformation is discussed and the relationship between sustainability and digital transformation is tried to be given as a review. As a result, it can be said that the success of digital transformation can be achieved through effective financial management and digital transformation makes a significant contribution to sustainability.

## Introduction

In today's fast-paced and interconnected world, the digital revolution has fundamentally reshaped the way businesses operate, opening up unprecedented opportunities and challenges. As organizations strive to stay competitive and meet the changing needs of their customers, digital transformation has emerged as a key imperative across all industries. But embarking on a successful digital transformation journey requires

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a comprehensive understanding of the financial aspect of the business. “Financial Aspects of Digital Transformation for Business” sheds light on the important intersection between finance and digital transformation, revealing the complex relationship that exists between technological advancements and financial strategies. It explores how organizations can harness the power of digital technologies to drive growth, optimize costs, enhance customer experiences, and ultimately achieve long-term financial sustainability.

As digital transformation permeates every aspect of modern business, organizations are presented with a wealth of opportunities to streamline processes, increase operational efficiency and gain competitive advantage. However, the digitalization journey is not without its challenges. Implementing digital initiatives often requires significant investment and requires careful financial planning and evaluation to ensure a positive return on investment. This paper examines the key financial considerations that businesses need to consider during their digital transformation initiatives. From assessing the costs and benefits of digital technologies to transforming business processes, the key steps organizations should take to ensure financial viability and success in their digital transformation efforts will be laid out.

In light of these developments, it would be appropriate to state that the needs and expectations of the digitalizing world are included in the concept of sustainability and that fulfilling these requirements is a universal goal. In today’s world where economy and digitalization, data and economy, freedom and internet access and many other concepts are intertwined, it would be incomplete to think otherwise and to talk about a sustainability that does not include the achievements of the information world.

The reflection of sustainable development on business science is considered as corporate sustainability. Corporate sustainability can be defined as dealing with economic, social and environmental dimensions as well as corporate governance principles to create value in the long term and managing risks by integrating them into all processes and decision-making mechanisms of the firm. According to this understanding, there are four fundamental forces that guide firms to decide and manage their activities. These four forces are legitimacy, gaining social credibility, responding to customer demands and the desire to act in line with investors’ expectations. Beyond these forces, the biggest reality is that firms are forced to act with an understanding of sustainability. That is to say, the fact that the resources that the world offers for one year of use are consumed in less than eight months is the biggest indicator that tomorrow is in danger. Therefore, in order to talk about the sustainability of a company, there is a need for a management that acts with

the awareness of its economic, social, and environmental responsibilities (Zehir & Özgül, 2020).

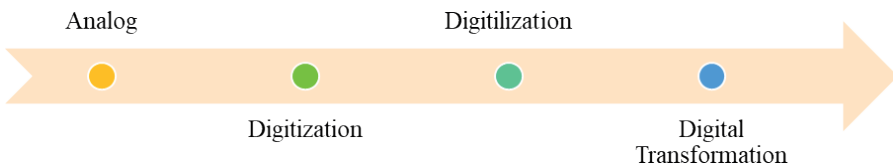
The main goal of digital transformation is to achieve high levels of automation and high levels of operational efficiency and effectiveness (Lu, 2017). The new industrial paradigm, built with the main components of cyber-physical systems, the Internet of Things, the Internet of Services, and the smart factory, aims to offer customers faster, more flexible and more customized products based on cooperation with robots. In this context, it is predicted that these developments will have a direct impact on the environment, economy, and society, which form the basis of the concept of sustainability.

## 1. Historical Development from Analog to Digital Transformation

Throughout history, humanity has been subjected to change through continuous development. The transition from hunter-gatherer society to agricultural society, from industrial society to information society and finally to digital society has been realized through this change. The transition to digital transformation, one of the most discussed topics of recent days, has also resulted in a similar change.

### 1.1. Analog and Digital

Digitalization started with the transfer of analog data to digital media. The process of transferring analog data to digital media is called digitalization. The processing of digitalized data transferred to digital environments and converting them into results to be used in the decision-making mechanisms of business functions is called digital transformation.



The word “digital”, which is of Latin origin and comes into our language from the French word “digital”, is defined in the Oxford English Dictionary (OED, 2023) as “digitization process, transformation of analog data”, and in the dictionary of the Turkish Language Association (TDK, 2023) as “digital”, “displaying data electronically on a screen” and “displaying data electronically on a screen”. Analog is defined as the opposite of digital. “Analog” derives from the Greek word “Analogos” (proportional) (Zeki, 2012). Values that we encounter in daily life such as heat, temperature,

pressure, weight, humidity, light, sound are quantities with analog structure (Demirel, 2012). In addition, the concept of digital can be defined as the ability to record and display information in the form of numbers (0 and 1) or to display and retrieve information in electronic form as a sequence of digits 1 and 0 with a system that can be used by a computer and other electronic devices (OED, 2023). For example, if there is electricity (1) the bulb lights up, if there is no electricity (0) the bulb does not light up. If the customer likes the product, it is recorded as (1) in the relevant digit of the questionnaire, if not, it is recorded as (0) in the database. These 1's and 0's are called "bits". Thanks to these bits, numerical and binary calculations developed. In the 18th and 19th centuries, developments in this field continued and with the invention of mechanical calculators, approaches to storing information gradually began to be developed (Aksu, 2019).

## **1.2. Digitization and Digitalization**

The process of converting analog data into digital data is called digitization, also known as digitization (Aksu, 2019). Digitization is defined by Coyle (2006) as "the conversion of physical or analog materials such as paper documents, photographs or graphic materials into electronic media or images stored in electronic media". Digitization refers to the coding of analog data (Ormanlı, 2012), which we encounter in different structures (words, pictures, heat, humidity, emphasis, songs, books, letters, etc.), into bits consisting of zeros and ones so that they can be stored, processed, and transmitted with the help of computers. Converting handwritten or typewritten text into digital form, converting music from an LP or video from a VHS tape is an example of digitization (Bloomberg, 2018).

In this respect, digitization, which converts analog data into digital data, and digitalization are two different concepts. Digitalization is to digitize any business, item or service or to offer it in digital media or to create a different business model with digital opportunities (Aksu, 2019). For example, if the sensors used in the enterprise are used to transmit the data they receive from a machine only to the manager, it is referred to as "digitization", while if the data transmitted by the sensors are used to detect malfunctions in the machine in advance, prevent malfunctions, optimize maintenance and repair programs, and improve the products coming out of the machine, it is referred to as "digitalization" (Gobble, 2018).

Digitalization, one of the most important trends shaping the present and the future, is undoubtedly an issue that all sectors should follow. Taking advantage of the opportunities created by technology and digitalization

provides companies with both a significant competitive advantage and benefits in many areas, from increased productivity to employee satisfaction (Zehir & Özgül, 2020).

### **1.3. Digital Transformation**

The transfer of analog data to the digital environment has initiated the digitization process. The digitization process has also led to the digitalization of existing resources, and digitalization has paved the way for digital transformation. Looking at this path; digital transformation has been achieved with the coding of analog data into 0s and 1s, the invention of transistors and microchips, and the process of processing and analyzing digital data with computers (Özdemir & Tan, 2023). Digital transformation, the use of technology to radically improve the performance of businesses or the way they do business, is a new and important topic for businesses around the world. Executives across all sectors refer to it as leveraging traditional technologies such as enterprise resource planning using digital advances such as analytics, mobility, social media, and smart embedded devices to change customer relationships, internal processes, and value propositions (Westerman et al., 2011).

Digital transformation can be defined as digitalizing all processes of businesses, starting from the procurement process with the developing new technology and including all business functions, and as a result, designing and producing products to meet customer demands with customer integration, and responding to customer needs in a way to gain competitive advantage by collecting data from all processes and processing this data (Özdemir & Tan, 2023).

The transition of businesses from analog to digital has taken place over a long historical period with the rapid developments in information technologies. The emergence of computer technology laid the foundation for the transition from analog to digital. From the 1940s onwards, computers began to be used as machines that could replace manual operations and process data in digital format, and during this period computers were generally used by large companies and research organizations (Campbell Kelly, 20004). In the 1960s and 1970s, the development of database management systems accelerated the transition from analog to digital transformation. These systems enabled businesses to work data-driven by storing, accessing, and managing data electronically (Date, 2003).

While the widespread use of personal computers in the late 1970s and early 1980s was an important step in the transition from analog to digital,

personal computers enabled businesses to automate data processing processes and work more efficiently (Ceruzzi, 2012). The commercialization of the internet in the early 1990s accelerated the digital transformation process of businesses. The Internet enabled businesses to communicate globally, conduct e-commerce and adopt digital marketing strategies. Since the early 2000s, the rise of mobile technology, smartphones, mobile applications, and cloud-based services have enabled businesses to optimize mobile working, customer relationship management and data access (Klein, 2013).

## **2. Financial Aspect of Digital Transformation**

Digital transformation, as described above, generally refers to the change and transformation of all business functions in relation to technology. The radical changes in production systems in enterprises also bring a serious burden to enterprises in terms of cost management. Considering the financing of digital transformation investments and the long-term return periods of these projects, the correct management of these costs directly affects the success of the digital transformation strategy.

Businesses aim to make faster, higher quality, flexible production and increase productivity by digitalizing their production processes. In this way, they aim to create more efficient production conditions by continuously improving their production systems. The cost management system becomes much more important in managing such a production process. In the digital transformation process, new and different approaches should be developed in strategic cost management, and cost management systems, as in every field, should adopt transformation by placing advanced information technologies into the system. Strategic cost management systems should develop enterprise-specific methods by analyzing the data emerging in the whole enterprise. Cost management systems should shape costing systems in line with the cost information that can be accessed by considering the production system, production activities, production environment, products, and sector of the enterprise (Pazarçeviren and Okay, 2023).

David Rogers, a faculty member at Columbia Business School and a consultant to businesses on digital transformation, summarized the main idea of his book “The Digital Transformation Playbook”, which he wrote to guide businesses on digital transformation, as “Digital transformation is about strategy and thinking, not technology”. The realization of digital transformation is related to the ability of businesses to update their strategic approaches rather than simply updating their technological infrastructure. Although the integration of advanced information technologies into

business systems and making them operational refers to the phenomenon of digitalization, the realization of digital transformation depends on the ability to think strategically by focusing on technology (Rogers, 2016). In this transformation process, businesses should also change their strategies in cost management and their perspective on costs, and they should increasingly use information technologies in cost calculation methods.

According to the Digital Transformation Maturity Model developed by Özdemir and Tan (2023), digital transformation consists of four main competencies and ten sub-competencies and skills. These four competencies are managerial digital competencies, human digital competencies, organizational digital competencies, and technological digital competencies. The sub-skills and capabilities are digital vision and strategy, digital governance, digital leadership, digital workforce, digital products, services and processes, digital culture, digital customer integration, digital production, digital technology, and digital security. Businesses that want to realize digital transformation need to make a radical change in all these competencies, talents, and skills. From this point of view, a serious cost is required for the change and transformation of each process. Contrary to popular belief, digital transformation does not only envisage technological change. It also includes managerial, human, and organizational change. First of all, business owners and managers should have a digital transformation vision and strategy. Then, all employees, from blue collar to white collar, should adopt digital transformation. After preparing the organization for digital transformation by going through this process smoothly, the technology dimension of the work comes into play.

In order to realize the digital transformation that covers all changes in this way, of course, a serious use of resources is required. In this process, the business needs to determine whether it will provide financing from internal sources (capital increase, debt from partners, etc.) or external sources (bank loan, foreign investor, new partner, debt items to vendors, etc.) in order to purchase the technology that will form the digital transformation infrastructure. In this process, a very serious strategic planning should be made and the least costly and longest-term resource utilization should be preferred, taking into account the investment return period of digital transformation.

In order to realize digital transformation, there are of course costs such as renewal of technologies in production systems, advertising, and promotion expenses to be made on digital platforms, personnel costs to manage digital transformation. However, if digital transformation is fully realized, it will



contribute to many more businesses such as raw material savings, reduction in labor costs with the use of machinery instead of manpower, gain from the reduction in waste with error-free product production, more product sales through digital platforms, increase in mass production with production lines working twenty-four hours a day and naturally increase in sales. This situation is also very important for the sustainability of the business.

### **3. Digital Transformation and Sustainability**

Digital transformation is reinventing businesses by creating new revenue streams in new ways (Wiles, 2019). New and adapted business models have been crafted by companies to capture value in the digital age. Becoming a customer-centric company, gaining a competitive edge, capitalizing on the enormous opportunities offered by digital capabilities, and having innovation capabilities are what companies are looking for during digital transformation (Hanna, 2016).

Sustainability is a broad concept that addresses many aspects of the human world (Beier et al., 2017). Sustainability is not limited to environmentalism as it also includes the protection of economic and social resources (Choi & Ng, 2011, Ford & Despeisse, 2016). The United Nations defines sustainability as a movement aimed at addressing ongoing global challenges such as injustice, inequality, peace, climate change, pollution, and environmental degradation, and to ensure a better and more sustainable well-being for all, including future generations. While sustainability is a relatively new concept, it has its roots in enduring movements such as protectionism or socio-economic justice (Caradonna, 2014).

In order to develop a sustainable society, organizations should move from value production to sustainable value production by prioritizing sustainability goals (Hart and Milstein 2003). According to the Brundtland Report, sustainability is defined as a form of economic development that 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987 p. 43). The concept of sustainability encompasses the linking of environmental protection with social development, which should be addressed by organizations in conjunction with economic development goals (Elkington 1997). Sustainability has a rich literature and academia has made significant contributions to the conceptualization and concretization of the three pillars of sustainability: environmental, economic, and social sustainability (Ford and Despeisse, 2016, Kamble et al., 2018, Khuntia et al., 2018).



The economic dimension relates to the organizational idea of generating economic value to guarantee the possibility of offering products and services to the market with an increase between revenues and costs, either by increasing added value in production or by reducing costs in the production process (Kiel et al. 2017). The environmental dimension refers to the organizational idea of creating value to alleviate pressure on the environment through rationalization of the use of natural resources, efficient energy consumption, consumption of renewable energy, and reduction of emissions and pollution (Braccini and Margherita 2019; Hertel and Wiesent 2013). The social dimension refers to the corporate idea of creating value in order to conduct fair business practices to benefit the workforce, the community and society at large. This dimension broadens the organization's perspective to include all stakeholders. It requires the organization to manage long-term survival and at the same time deal with social issues related to community engagement, employee relations, fair wages, quality of life, social integration in communities, solidarity, equality and justice, and equal opportunity in education (Kiel et al. 2017). The economic, environmental, and social dimensions of sustainability are interconnected. To achieve sustainable value creation, organizations need to embrace all three dimensions in their business models (Jayaprakash and Pillai 2019).

## **Conclusion**

As a result, in order to realize digital transformation, it is necessary to have a digital vision and strategy, to create a digital transformation culture in the entire organization, starting from the top management to the lowest level employees, and to provide the resources required for digital transformation effectively and efficiently. In this context, financial planning should be done in line with the digital transformation strategy. With an effective resource planning, the technological infrastructure necessary for digital transformation should be created.

In addition, the contribution of digital transformation to the sustainable goals of the business is another important issue. This issue can be handled on two sides. While the sustainability of digital transformation refers to the first side, the positive impact of sustainability on the realization of digital transformation refers to the second side. Because here, the reduction in resource utilization of enterprises with the transition to digital transformation will contribute to sustainability.

Improved process performance means improved economic performance, as companies are able to deliver high-quality, defect-free, customized products

to the market. It promotes more sustainable products and services through reduced resource use, reduced energy needs and reduced waste. While better working conditions have a motivational effect on employee morale (Braccini and Margherita 2019; Lee et al. 2011; Lee et al. 2017), the need for skilled supervisors and the availability of timely and accurate information provide new opportunities for employees to take on new roles and responsibilities, creating much new knowledge-intensive positions in organizations and new job roles on the assembly line. Such opportunities contribute to social sustainability, because in this way organizations implementing digital transformation technologies can maintain employment levels and promote a sustainable society. On the one hand, the number of workers required is reduced due to automation. On the other hand, organizations can offer employees with the right skills and knowledge positions related to planning, control, and research, which the transition to using digital transformation technologies promotes.

As a result, a digital transformation with a well-performed cost analysis will contribute to increasing effectiveness and efficiency in businesses and will create a more sustainable business model.

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