SITJOURNAL
Security Intelligence Terrorism Journal

*Security Intelligence Terrorism Journal (SITJ), Vol. 01 No. 01 (2024), pp. 22-40*

# An Academic Analysis of Digital Transformation: A Comprehensive Review of Literature and Business Strategies

Muhammad Alfi Fadhlurrahman[1]

[1]Department of School of Strategic and Global Studies, Universitas Indonesia, Jakarta, Indonesia
[1]muhammadalfi99@gmail.com

**Article Info**
Received: 29-Jun-2024
Revised: 29-Jul-2024
Accepted: 11-Aug-2024

**Keywords**
Business Strategy; Customer Experience; Digital Platform; Digital Transformation

**Abstract**
The idea of digital transformation has an impact on many different facets of business. The goal of this study is to examine how digital transformation affects businesses, industries, and society as a whole, with a particular emphasis on business models, operational procedures, and customer experience. To examine the definitions, components, pillars, and important facets of digital transformation, this study uses a literature review methodology. The review's findings show that using digital technology to modernize corporate processes and improve productivity, responsiveness, and creativity is included in the concept of digital transformation. The components of digital transformation are also described in this study, including business models, digital platforms, employee experience, customer experience, and operational procedures within the organization. The customer experience, business models, and operational procedures of the organization are the three primary pillars of digital transformation. In addition, there are five essential components of digital transformation: value, data, customers, competition, and innovation. In a connected and quickly evolving business environment, digital transformation is becoming more and more significant, and firm executives need to have a long-term vision to take advantage of the potential.

## 1. Introduction

Digital technologies, which are defined as information technology, computing, communication, and connectivity, have altered business strategies, business procedures, and the capacity of organizations to produce goods and services over the last thirty years (Bharadwaj, 2013) At present, the world is experiencing all kinds of digital transformation in all fields, both in terms of customers, and technology are becoming interconnected with each other. According to the report, 78% of respondents said digital transformation will be very important for organizations in the next two years, and 63% said the pace of digital transformation in organizations or companies is too slow. The most frequent obstacle to digital transformation is the "lack of urgency" about the importance of digital transformation in an organization or company (Fitzgerald et al., 2014). In an organization, companies need to find new ways of innovation that use technology to design digital transformation-based strategies that the aim of making the performance of a company better than before (Hess et al., 2016). Digital transformation is an important issue around the world, because it has a major impact on all companies in all sectors, changing relationships with customers, internal processes, and the creation of corporate business value (Zaoui & Souissi, 2020). In an environment where change is constant and emergent, most organizations now consider digital transformation (DT) to be essential (Gong & Ribiere, 2021). This statement emphasizes the importance of companies developing strategies that not only adopt digital technology but also understand its implications and impacts in transforming. The goal of this strategy is to improve the company's operational performance. In other words, companies need to incorporate digital technology into their business models so that they can be more efficient, responsive, and innovative in carrying out their operations. Thus, a digital

*Corresponding author, email: muhammadalfi99@gmail.com
doi: -

transformation strategy is not just about implementing technology, but also about how the technology can drive improvements in the company's operational performance.

This research project was spurred by the realization that different people have different definitions or descriptions of digital transformation (DT), which has resulted in the creation of buzzwords and hype in academic and professional literature. On the other hand, the subject of exactly what DT is and how we should conceptualize it has received insufficient attention. In the long run, scholars and practitioners won't be able to "advance the theory and practice" of the field without the adoption of a single definition (Stock & Boyer, 2009). Although the literature now in publication indicates a new degree of interest in this field, there is evidence that this concept is not widely and thoroughly understood (Goerzig & Bauernhansl, 2018; Gray & Rumpe, 2017; Haffke et al., 2016; Morakanyane et al., 2017; Van Veldhoven & Vanthienen, 2022). Several gaps persist in the vast body of research on digital transformation. Although a large number of studies have concentrated on the technological components of digital transformation, a dearth of thorough evaluations that incorporate technology into business strategy and organizational culture exists. Second, there is a knowledge gap on the effects of DT on enterprises in emerging countries because the majority of research has been carried out in developed economies. Third, the long-term implications of digital transformation (DT) on small and medium-sized firms (SMEs) are not well studied, especially concerning maintaining innovation and competitive advantage. With an emphasis on SMEs in emerging economies, this study attempts to close these gaps by offering a comprehensive analysis of DT that takes into account its technological, strategic, and cultural aspects (Morakanyane et al., 2017; Van Veldhoven & Vanthienen, 2022).

Figure 1's bibliometric map shows the connections between different groups, keywords, and DT. Here, the size of the connecting lines between the nodes as well as the nodes themselves serve as indicators of the links' strength and importance (Kraus et al., 2021). Big data, artificial intelligence, and data analytics are examples of technology that is seen to be strongly related to digital transformation (DT). This shows that using DT to obtain a competitive edge can be facilitated by technology as well as used as a tool. DT is also associated with leadership, value creation, supply chain management, digital strategy, and entrepreneurship. The image is a complex network map illustrating the concept of digital transformation and its various interconnected components. At the center of the network is "digital transformation," represented as the largest node, indicating its central role. Surrounding this central node are multiple smaller nodes, each representing key areas and topics associated with digital transformation.

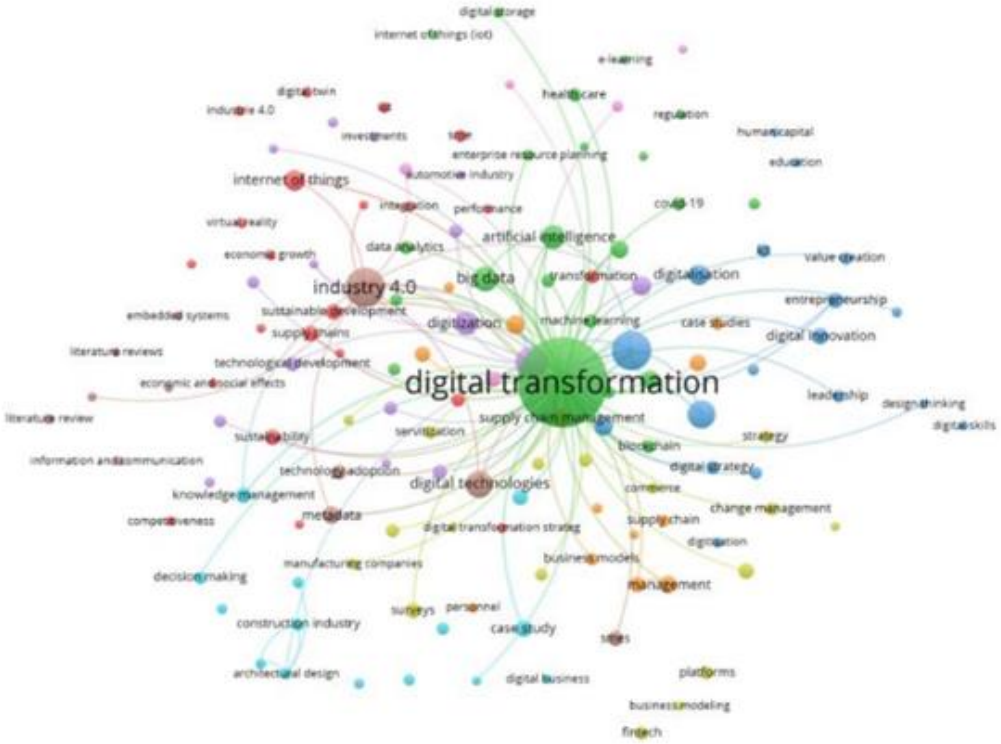

**Figure 1.** The bibliometric maps of digital transformation

Some of the prominent nodes include "industry 4.0," "digital technologies," "artificial intelligence," "big data," and "Internet of Things (IoT)," reflecting major technological domains that drive digital transformation. Each of these nodes further branches out into more specific topics such as "machine learning," "blockchain," "data analytics," "smart manufacturing," "supply chain management," and "digital innovation." The map uses different colors and line thicknesses to signify the strength and nature of the connections between these topics. For instance, thicker lines suggest stronger or more significant relationships. Additional nodes represent various sectors and applications influenced by digital transformation, such as "healthcare," "education," "e-learning," "fintech," "sustainability," and "economic growth." Overall, the network map provides a visual representation of how digital transformation is interconnected with a wide range of technologies, industries, and concepts, highlighting its extensive impact and the interdependencies among these components.

Through recent research, researchers have better knowledge about aspects of digital transformation. Recent research has contributed to an improved understanding of certain aspects of the digital transformation (DT) phenomenon. Previous findings on IT-enabled transformation, previous research has shown that technology itself is only a part or a tool that can help organizations remain competitive in the digital world. While technology plays an important role in digital transformation, other factors such as business strategy, organizational culture, and human factors also contribute greatly to keeping organizations competitive in an increasingly digital world. In other words, digital transformation is a challenge that involves more than just implementing technology, it involves a deep understanding of how technology can be integrated with a smart business strategy and a supportive organizational culture. Given the transformative effects of digital technology on nearly every area of an organization's internal and external environment, the development and implementation of a digital transformation strategy (DTS) has become a critical concern for many pre-digital enterprises. According to Chanias (2019), pre-digital firms are well-known companies in traditional industries like retail, car, or financial services that performed well financially in the pre-digital age but were threatened by the digital economy. To handle this intricate digital transformation, an organization must set up management procedures. Making a plan for digital transformation that functions as a single point of contact for all internal corporate coordination, prioritization, and execution is a crucial strategy (Matt et al., 2015). Thus, the goal of this study is to examine how digital transformation affects businesses, industries, and society as a whole, with a particular emphasis on features of business models, customer experience, and operational procedures.

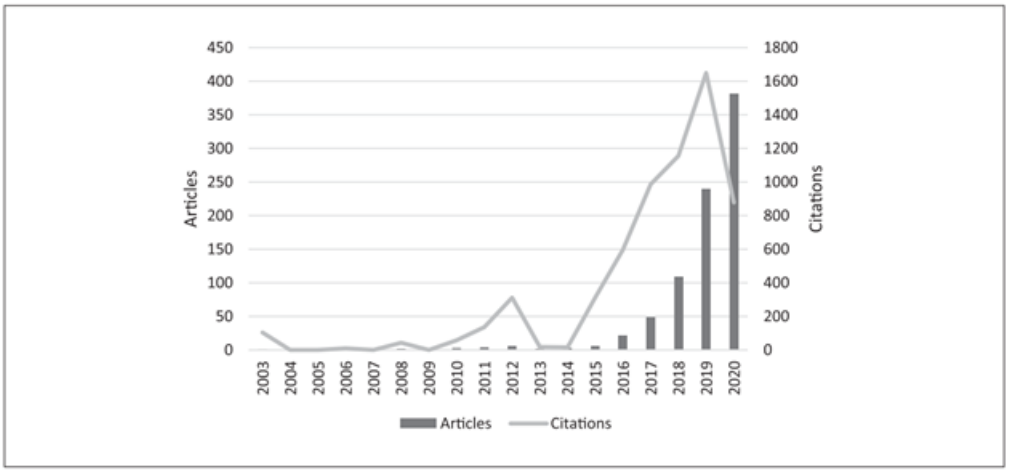


**Figure 2.** Publications Selected For The Literature Review In Chronological Order

Figure 2 presents a summary of research on DT, and shows the continued interest in this subject of study; since 2018, the rate of increase in scientific output has been exponential. Moreover, it can be deduced from the polynomial regression line that this tendency will persist in the upcoming years. Recent developments in this subject have led to an increase in research on digital technologies, including e-commerce and artificial intelligence. The chart illustrates the trends in the number of published articles and their corresponding citations from 2003 to 2020 (Gong & Ribiere, 2021). Initially, from 2003 to 2015, the research activity, as indicated by both articles and citations, remained relatively low and stable with

minor fluctuations. During this period, the annual count of articles and citations hovered at modest levels, indicating limited academic attention or focus in the specific area under study. A significant shift occurs from 2016 onwards, where there is a pronounced surge in both the publication of articles and the number of citations. This marks the beginning of a rapid growth phase in research activity. The number of articles published starts to rise sharply, indicating a growing interest and increased research output in the field. Correspondingly, citations also escalate, suggesting that the new research is gaining considerable recognition and influence within the academic community. The peak of this trend was observed in 2019 when the number of articles reached over 400, and citations peaked at more than 1600. This peak highlights a year of exceptional academic productivity and impact. In 2020, while the number of articles remains high, close to the previous year's peak, there is a slight decline in citations, though they remain significantly higher than in earlier years. This overall trend from 2003 to 2020 depicts a dramatic increase in both the quantity and impact of research articles over time, especially noticeable in the later years. This could be attributed to various factors such as advancements in the field, increased funding, or a growing community of researchers contributing to the subject matter.

This study contributes to the literature by offering a comprehensive review that integrates the technological, strategic, and cultural aspects of digital transformation. Unlike previous studies that often focus on isolated elements of DT, our research provides a holistic perspective that considers the interplay between these elements. Additionally, by focusing on SMEs in emerging markets, this study addresses an underexplored area, providing insights that are critical for policymakers and business leaders in these regions. This original approach not only enhances our understanding of DT but also provides practical guidelines for implementing effective DT strategies in diverse business contexts.

## 2. Literature Review

This study's literature review was broken down into two sections: a systematic literature review (SLR) with a bibliometric co-occurrence analysis using the VOSviewer software that gathered pre-existing definitions of DT and a literature review that examined the approaches utilized to create a single definition, why it was necessary, and how to achieve it. Many studies of design theory (DT) have emerged in the literature as a result of the noticeable shifts in certain industries; nonetheless, there is still a great deal of misunderstanding and uncertainty surrounding DT. It results from the multiplicity of the research stream without a strong basis of mutual comprehension of the crucial idea of digital transformation.

The use of digital technologies was given high priority at first. Subsequently, businesses and academics began to realize that DT was more than just a shift in technology (Henriette et al., 2015), and that in addition to technology, other elements like people, arts, mentality, and leadership must also be aligned with the plan (Goran et al., 2017). Some definitions focus on the effects of DT, like improving operational efficiency. Just a few examples are as follows: DT can facilitate better decision-making (Heilig et al., 2017; Roedder et al., 2016), to establish a competitive edge (Korhonen & Halén, 2017). Customer value creation such as maximizing customer requirements and experiences, is mentioned by several writers (Rogers, 2016). DT is viewed as entirely different in many of the current studies. For example, some writers see DT as a minor technological advancement similar to putting in place a new ERP system (Chanias, 2017), on the other hand, think that DT is a more radical and gradual procedure (Janowski, 2015; Loebbecke & Picot, 2015; Wang et al., 2018). While some academics link DT to corporate models (Berman, 2012; Bharadwaj, 2013; Gassmann & Frankenberger, 2014) and plan (Bharadwaj, 2013; Henriette et al., 2015; Matt et al., 2015; Rogers, 2016; Westerman et al., 2014), DT is perceived by some as a process or paradigm (Berman, 2012; Janowski, 2015; Wang et al., 2018).

Digital transformation is the use of digital technologies to modernize and improve business operations, increasing efficiency, responsiveness, and innovation. It involves using tools such as cloud computing, data analytics, the Internet of Things, and artificial intelligence to change the way an organization works, interacts with customers, and achieves its business goals (Siebel & Rice, 2019). Digital transformation is becoming increasingly important as organizations begin to realize they must adapt and change faster. The digital transformation process aims to produce significant changes in the characteristics of an entity by integrating information technology, computing, communication, and connectivity (Vial, 2019). Digital transformation is not only focused on technology, there are more important things that focus on new and different business strategies and processes than before (Rogers, 2016). The use of technology to enhance business performance is known as digital transformation or DT. To alter internal processes, value provided, and consumer interactions, digital transformation entails integrating old technology like ERP with cutting-edge modern solutions (Westerman et al., 2011). Three terms are used in the definition of digital

transformation: industry entities, community entities, and organizational entities (Agarwal et al., 2011; Vial, 2019). Companies can handle changes brought about by the use of digital technology by implementing a digital transformation strategy, which also helps them implement their business processes following the transition (Matt et al., 2015). Users of digital transformation seek to enhance business performance (Bekkhus, 2016). A shift or transformation that is fueled by and constructed upon digital technologies is referred to as digital transformation. A company's transition from traditional organizational work techniques to big data, data analytics, cloud, mobile, and social media platforms is known as digital transformation. In response to business developments, organizations always adapt and change. Digital transformation, which is based on digital technology, affects business operations, business procedures, and the generation of value inside the organization (Nwankpa & Roumani, 2016). The aforementioned statement highlights that digital transformation encompasses more than just the adoption of novel technologies or the installation of advanced hardware and software. Rather, it involves fundamental business strategy changes and changes in the way organizations think. Digital transformation involves innovative thinking about how to deal with technological change and how technology can be used to achieve greater business goals, it also involves adapting to rapidly changing environments and finding new ways to deliver more value to customers.

## 3. Method

To address the deficiencies in the methodology section of the journal, we have provided a more detailed and systematic explanation. This study employs an inductive approach using grounded theory methodology as proposed by Wolfswinkel et al. (2013). The approach involves a thorough literature review to identify and analyze key components of digital transformation in a business context. The research procedure began with defining the study's scope, which covers digital transformation in business models, customer experience, and operational processes. A comprehensive literature search was conducted using keywords such as "Digital Transformation" and "Business Strategies" in databases like Library UI, JSTOR, Oxford Academic, ScienceDirect, MIS Quarterly, and Journal of Information Systems. Relevant articles were selected based on inclusion and exclusion criteria to ensure quality and relevance, followed by a qualitative analysis to identify the main themes and relationships between concepts in digital transformation. The results were then presented in a comprehensive and systematic scientific article.

The study focuses on digital transformation in the business sector, specifically targeting companies from various industry sectors that have implemented digital transformation in their operations. These companies vary in size (large, medium, and small), geographical location (developed and developing regions), and level of digital technology adoption. Data were collected through an extensive literature review from the aforementioned academic sources, supplemented by secondary data from industry reports, business publications, and company case studies.

The collected data were processed using thematic analysis, involving coding, grouping themes, and identifying patterns of relationships among themes. The data were analyzed qualitatively using grounded theory to develop a theory based on empirical data. The analysis proceeded through stages of open coding (identifying main concepts), axial coding (connecting main concepts with sub-categories), and selective coding (integrating and refining categories to form a coherent theory).

Finally, all research procedures were conducted in compliance with ethical guidelines to ensure data confidentiality and privacy. This comprehensive methodology provides a clear, detailed, and systematic explanation of the research process, addressing the previously identified deficiencies.

## 4. Result and Discussion

According to other researchers, digital transformation is about deeper changes in how an organization operates and thinks than simply adopting new technologies. Strategy as well as changes in the organization (Bharadwaj, 2013), including organizational structure (Selander & Jarvenpaa, 2016) are needed to generate the ability to create new opportunities or create added value for the organization. To achieve the ability to create new value, organizations need to have the right strategy. In addition, organizations must also be ready to make changes in their structure, operational processes, and corporate culture. Transformations in these aspects are necessary for organizations to find innovative ways to create additional value or new opportunities. In other words, to become more innovative and relevant in a changing environment, organizations must adopt the necessary strategies and changes. When it comes to their digital transformation, most businesses still have a ways to go. Redesigning and enacting change in

the organization's business processes is essential to digital transformation, regardless of the use of new or traditional technologies. The problem of digital transformation is related to management and human resource challenges, not just technological problems (Westerman et al., 2011), digital transformation has an organizational impact on human resources, the work undertaken develops along with the transformation of activities, on the other hand, the role of company leaders needs to consider the development of knowledge and skills (Liu et al., 2012). Based on research conducted by previous researchers. According to researchers, the definition of digital transformation is a process that aims to improve certain entities to provide changes to other entities by using a combination of information technology, communication, and connectivity.

We discovered two frequently mentioned sets of definitions with a confusion issue between the idea of DT and its result based on the definitions taken from the body of existing literature. Using technology to dramatically increase an enterprise's performance or reach is how the first group (see Table 1) characterized digital transformation (Bekkhus, 2016; Gruman, 2016; Westerman et al., 2014). Moreover, the second group (refer to Table 2) described DT as "the application of new digital technologies to facilitate significant business advance."

**Table 1.** The initial definition of the group that had confusion issues

| Authors | Definition |
|---|---|
| Bekkhus, 2016 | The implementation of digital technology to significantly enhance business performance. |
| Gruman, 2016 | Digital technology use has a profound impact on many facets of society and commerce. |
| Westerman et al., 2011 | The use of technology to greatly improve an organization's output or scope. |
| Westerman et al., 2014 | The utilization of innovative digital technologies and creative strategies to enhance an organization's operational efficiency. |

As a result, the idea of DT has grown so trendy that it runs the risk of being "stretched" to the point where it is practically synonymous with all discussion in both the practitioner and academic communities, creating theoretical ambiguity and practical misunderstanding. For instance, as DT deals with using digital technologies to accomplish goals, it should clarify the process of transformation. It has an integrated impact on a single organization, the business community, the sector, the community at large, and even the global community (Gong & Ribiere, 2021). Further examples would expand the idea by including several characteristics to make it widely applicable, such as defining DT as consumerization, evolution, automation, or investment as a major category. Many factors, including the need for parsimony, the association of buzzwords, and the shifting focus of interpretation, may motivate this type of description.

**Table 2.** The conflation problems in the second group definition, extend concepts.

| Authors | Definition |
|---|---|
| Fitzgerald et al., 2014 | The process of enabling significant business improvements (like improving customer experience, optimizing processes, or developing new business models) through the use of emerging digital technologies (social media, mobile, analytics, or embedded devices). |
| Brown et al., 2014 | Digital transformation encompasses essential organizational and cultural changes alongside the adoption of new digital technologies. This combination enables substantial advancements, such as enhancing user services, optimizing operations, and creating entirely new services. |
| Horlacher & Hess, 2016 | Employing cutting-edge digital technologies to facilitate major commercial advantages like process optimization, customer experience enhancement, or the creation of new company models. These technologies include embedded devices, mobile, social media, analytics, and mobile devices. |
| Paavola et al., 2017 | The use of digital technology to support important advancements in the market and operations in 2017; |

| | |
|---|---|
| | examples include enhancing consumer satisfaction, streamlining processes, and creating new business models. |
| Chanias, 2017 | The expanded application of cutting-edge IT to support significant business benefits, such as analytics, mobile computing, social media, and smart embedded devices; and the enhanced use of established technologies, including enterprise resource planning (ERP). |

Apart from these two major concerns, we additionally deleted definitions that were insufficient and violated conceptual clarity (for instance, see Table 3) based on additional criteria supplied by Wacker (2004) and Suddaby (2010). Though we think that several definitions raise questions regarding conceptual clarity, they are nonetheless valuable in helping us comprehend DT, so they were left intact. By reevaluating definitions jointly, the two authors' minor disagreements were settled.

**Table 3.** Conceptually unclear definitions present difficulties. Analysis of semantics is the second level.

| Authors | Definition | The challenge of conceptual clarity |
|---|---|---|
| Stolterman & Fors, 2004 | The modifications that digital technology brings about affect every facet of human existence. | Misunderstanding of the idea and its effects |
| White, 2012 | The term "consumerization of IT" refers to the result of the merging of personal and business IT systems. | Extending concepts toward consumerization |
| McDonald & Rowsell-Jones, 2012 | Digital transformation (DT) produces value and income from digital assets by doing more than just digitizing resources. | A hazy definition using phrases of comparison |
| Mazzone, 2014 | The intentional and continuous digital transformation, from a strategic and tactical standpoint, of an organization, business model, concept process, or technique. | conceptual expansion toward continuous |
| Iansiti & Lakhani, 2014 | The process of digitizing duties related to organization, and management. It modifies a business model in two ways: first, by altering the way the company generates value for its clients (the customer value proposition); second, by altering the method it earns revenue from those clients. | Undefined word: digitalization |
| Betz et al., 2016 | The growing automation of corporate operations, methods, practices, and models in reaction to the growing opportunities and impact of computing and information technologies. | Stretching concepts to automate |
| Herbert, 2017 | The capacity of an organization to adapt and make effective use of new technologies and practices, both now and in the future. | A broad definition that characterizes the phenomena as an ability to convey its main features |
| Gaivoronskii et al., 2017 | DT encompasses both revolutionary and evolutionary shifts in technology and industry. | Using opposing qualities to define something ambiguously |
| Rowe, 2017 | The expenditure of money on technology and human capital to run a company ready to expand, scale, adapt, and change over the coming years. | A broad definition that uses the word "investment" to convey the essence of the phenomenon |
| Legner et al., 2017 | DT is visible in many societal domains, including significant IT-driven modifications to judicial systems, political decision-making processes, and labor market supply and demand. | The dissonance between the idea and the desired result |
| Leodolter, 2017 | One definition of DT is a meta-development in society. | A concise explanation |

| | | |
|---|---|---|
| Ismail et al., 2017 | The process by which businesses integrate various new digital technologies and improve them with ubiquitous connectivity to achieve superior performance and a sustained competitive advantage. This transformation affects several business dimensions, such as the business model, the customer experience (which includes digitally enabled goods and services), operations (which includes processes and decision-making), and people (including talent, skills, and culture) as well as networks (which includes the value system as a whole). | The conflation of the predicted result with the means |
| Hartl & Hess, 2017 | The transformation of businesses through the digitization of core operations, customer touchpoints, products, services, and business models, is made possible by IT. Its complete approach and rapidity set it apart from earlier IT-enabled corporate transformations. | Comparative definition: earlier business revolutions made possible by IT |
| Solis & Szymanski, 2016 | The creation and investment in new technology, ways of thinking, and business and operational models to boost productivity and competitiveness and provide clients and staff with fresh, pertinent value in a constantly changing digital economy. | Uncertain word: new technology |
| Al-Ruithe et al., 2018 | With the help of digital transformation (DT), businesses can enhance customer experiences and business processes by combining digital and physical elements. | The dissonance between the idea and the desired result |

Table 8 illustrates how DT is currently defined using a variety of ambiguous terminology and differing levels of parsimony in existing definitions. Even so, the majority of people still experience cognitive clicks with DT. The most obvious defense of DT these days is that most people can locate DT concept components that naturally fit into scenarios in their daily lives and places of employment. Therefore, DT satisfies these requirements, which seems to be the primary reason it became so popular so quickly. On the other hand, the notion of differentiation theory (DT) loses its practical relevance when it is applied to change, process, strategy, or technology. On the other hand, if digital transformation is a cohesive concept that combines technology, process, strategy, and change in an integrated manner, then it will differ from existing ideas rather than replace them. Furthermore, it would represent an idea that fairly well satisfies the majority of criteria. Therefore, strictly speaking, only the broad conceptualization satisfies the field usefulness requirement.

Our concept of digital transformation (DT), which we define as a fundamental change process facilitated by digital technologies to create value for its stakeholders by strategically exploiting its essential resources and competencies, was developed using the stated core criteria. The goal of DT is to significantly innovate and improve an entity (such as a company, industry, organization, or society). We have found that the target entity primitive is associated with a particular industry, business network, organization, and society; therefore, it may be applied in a broader variety of scenarios, including organizational, industrial, and societal ones.

## 4.1. Elements of Digital Transformation

In contrast to previous research on 9 important elements in the world of digital transformation (Westerman et al., 2014). Because of the rapid and continuous development of technology where digital technology creates advantages that create competition. The 9 elements are updated to 9 new elements of digital transformation with digital experts / digital matters (Bonnet & Westerman, 2020). Digital experts

develop two capabilities, namely digital capabilities and leadership capabilities. Digital capability is an ability that allows these experts to use innovative technology to improve other business elements, and leadership capability, is used to drive organizational change systematically and benefit the company.

A company or organization can leverage digital technology as a competitive advantage because of these two characteristics. Digital literacy is more important than ever because it increases the likelihood of falling behind. Technological developments like 5G, the Internet of Things (IoT), artificial intelligence, virtual and augmented reality, and more have opened up new possibilities for value creation. More significantly, today's CEOs know that changing the way firms run can and should be done. Policy leaders, or stakeholders, understand that deliberate strategy development and corporate technology use are more necessary than random technological testing. A select few companies have successfully proceeded to the second stage of the digital transformation process after finishing the first step. A survey conducted in 2018 among 1,300 executives from more than 750 global organizations found that many companies are still having difficulty. Out of them, only 38% said their organization had the digital skills required to become a digital master, and only 35% said they had the leadership skills to do this. The fact that COVID-19 has accelerated the shift to digital operations makes this even more alarming; these digital experts are falling behind and widening the gap between their companies' capabilities and those of their competitors.

The 9 elements of digital capability have been reviewed to open up new opportunities and new digital technologies. Some elements remain unchanged, such as those for improving the customer experience and those where internal operations are critical and unchanged. Since employees are the ones who operate the company and have firsthand knowledge of where business processes need to be improved, the employee experience has changed from being a single component to a collection of stand-alone components. With the rise of multisided platform companies and the increasing dominance of major global platform giants like Alibaba, Amazon, and Google, the business model innovation component has also changed. Then there is the digital platform component, which serves as the foundation for every other component of a business.

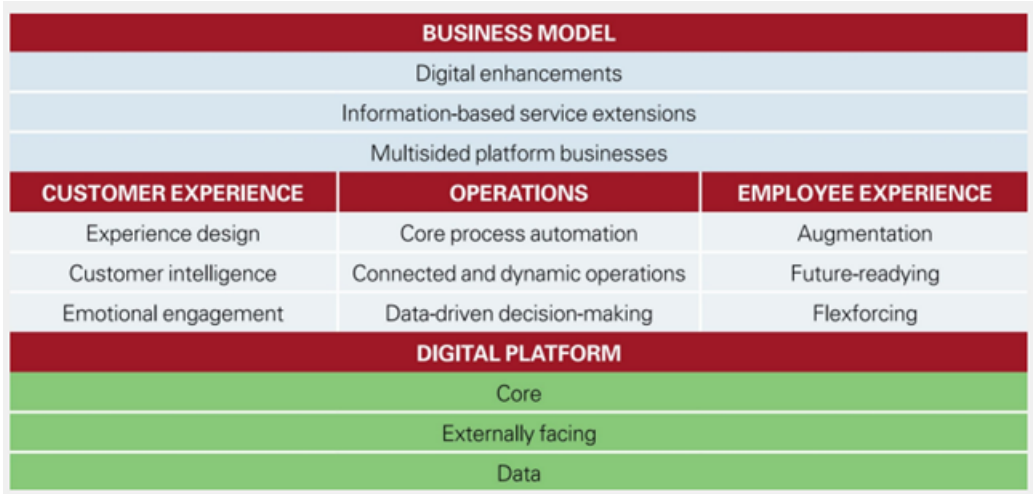


**Figure 3.** Elements of Digital Transformation

**Part One: Customer Experience Transformation**

Looking at the business perspective from the outside in, from the customer perspective is equally relevant and indispensable at this phase. Today, there are three main elements to focus on: customer experience design, customer intelligence, and customer emotional engagement. Customer experience has become a key asset for many companies. The former requires tools such as customer journey and personality mapping, and thinking from the customer's perspective. These methods provide a meaningful understanding of human behavior and the ability to uncover customer insights through observation, listening carefully to customer complaints, and experimenting with customers. Then, it is supported by the ability to digitally re-engineer the customer experience. Then, customer intelligence is the integration of customer data among various divisions and understanding of customer behavior. Finally, emotional connection with customers is as important as technology in creating customer experience. In a study, emotionally engaged customers proved to be 52% more valuable than customers who are only concerned

with satisfaction. For this reason, companies are using digital technology to solicit customer participation throughout the value chain of a company's business processes. For example, Uniqlo uses an emotional connection with its customers through the concept of My Uniqlo Idea. On the other hand, company leaders conduct digital transformation focusing on three elements: customer experience, company operational processes, and organization/company business models (Westerman et al., 2011).

**Second part: Company Operations**

Effective management of company operations is crucial for converting revenue into profit; yet, the focus of digital transformation is currently shifting away from this sector. Technological developments in sensors, cloud computing, machine learning, and the Internet of Things (IoT) are allowing businesses across all sectors to revolutionize their operational capacities. Leaders are also considering how their organization's operational excellence may provide compelling customer experiences and a unique business model that rivals cannot match, going beyond back-office efficiency. The three components of digital capabilities that comprise this operational transformation are data-driven decision-making, linked and dynamic operations, and core process automation.

**Part Three: Transforming the Employee Experience**

Employees are arguably the biggest bottleneck in a company's business processes. Therefore, companies are starting to focus on the employee experience just as they focus on the customer experience. The three elements of employee experience are: augmentation, future-readying, and adapting to the evolving nature of work in the digital age (flexforcing).

**Part Four: Business Model Transformation**

In 2014, just 7% of new firms were launched utilizing digital technology efforts, and only 15% of new business models were developed with the use of digital technology. Business executives across all industries are now paying more attention to how new business model innovations can be produced via digital transformation. The business process consists of three key components: multisided platforms, information-based service expansions, and digital upgrades.

**Part Five: Digital Platform Transformation**

This assertion clarifies how current developments in methodology and technology have simultaneously made the task of creating a strong digital platform easier and more challenging. Technological advancements that facilitate the rapid development of new services, such as cloud computing, agile development methodologies, external code libraries, and user-friendly development tools, can also cause incompatibilities and complexity in the technical infrastructure.

On the other hand, there are some practices and technologies such as Agile (more flexible development methods), GitHub (a platform for programming code management), DevOps (practices that integrate development and operations), and the use of containers and microservices (modular development solutions) that make it easier to coordinate changes, innovate quickly, safely, and intelligently, and avoid repeating existing work.

A leader must consider how digital technology can be used not only to improve products and business processes but also to reinvent business objectives. Digital capabilities and leadership skills aim to drive organizational change and are key to overcoming challenges. Since the onset of COVID-19, it has forced companies to prioritize which goals are more important than others. The key message is that while emergencies like the COVID-19 pandemic have pushed companies to adapt quickly, leaders must also have a long-term vision for how digital technology can fundamentally change their business. Digital transformation and leadership's ability to drive organizational change are key to overcoming these challenges and capitalizing on the opportunities.

## 4.2. 5 Keys to Digital Transformation

Digital forces are influencing and changing five important aspects of strategy in business, namely how companies interact with customers, compete with competitors, use data, drive innovation, and create value

(Rogers, 2016) (See Figure 4). These five domains reflect the main focus of digital transformation and provide a helpful framework for understanding the changes that occur in business due to digital change.


**Figure 4.** Digital Transformation Elements

With these five keys above, with the existence of digital technology, a company must reorganize the basic principles of business strategy and change business rules so that the company can adapt and create success. A company that existed before the advent of the Internet needs to realize that the basic structure of its business needs to be improved. Table 4. describes the changes in business processes from the traditional era to the digital era. The 5 keys to digital transformation are described below:

The first key is the customer. The alternative approach applied in the conventional era is to try to approach customers by trying to sell products and services to as many customers as possible with the same method. In the digital era, customers are seen as unique individuals with different preferences. This results in changes in interacting with customers, understanding customer preferences, and providing a more customized experience. Digital transformation has changed the paradigm of the relationship between companies and customers. In the digital age, customers are no longer passive consumers but rather active participants in a dynamic network that shapes markets and companies while also giving reciprocity to one another (Rogers, 2016).

The second key is competition. How a business competes and cooperates with other companies. Traditionally, competition and cooperation are thought of as binary opposites: competing with businesses that have something in common with the category and type of business and cooperating with supplier partners who distribute the business's goods and provide the raw materials necessary for production.

**Table 4.** Five Keys to Digital Transformation from the Analog Era to the Digital Era

| *Customers* | *From* | *To* |
|---|---|---|
| | • Establish a pre-defined customer market<br>• One-way communication to customers<br>• Main influence is the company | • Customers as a dynamic market<br>• Two-way communication with customers<br>• The main influence is the customer |

| | | |
|---|---|---|
| *Competition* | • Profit-based economy of the firm<br>• Purposeful competition<br>• Clear distinction between partners and competitors<br>• Business competition with each other | • Customer valuation-based economy<br>• Flexible competition<br>• Difficult to know which are partners and competitors<br>• Business competitors can work together |
| *Data* | • Data is difficult to obtain and valuable<br>• Using only structured data<br>• Data is a tool to optimize business processes | • Data is everywhere<br>• Using unstructured data is increasingly valuable and valuable<br>• Data as an intangible asset to create more value for the company |
| *Innovation* | • Decisions are made based on intuition and seniority<br>• Testing an idea is expensive and difficult<br>• Experiments are only conducted by experts<br>• Creation of products that benefit customers | • Decisions are made based on testing and validation<br>• Testing an idea becomes cheap and easy to use<br>• Experimentation can be done by everyone<br>• Product creation to identify problems and customer needs |
| *Value* | • Value proposition is determined by the company<br>• Products are made only based on the company's goals | • Value proposition is defined by the customer<br>• Products are made to add value to customers |

The third key is Data. How businesses generate, manage, and use data that is processed into information. Typically, information is collected through a variety of pre-planned measurement methods (from customer surveys to inventory recording) conducted in various aspects of the business such as manufacturing, operations, sales, and marketing. The collected data is utilized for evaluation and decision-making purposes.

The fourth key is Innovation. Innovation is the process by which new ideas are generated, tested, and introduced to the market by the company. In the past, innovation was often only concerned with the development of end products. Since market testing at that time was difficult and expensive, many decisions regarding innovation were based on managerial analysis and intuition. The cost of failure was high, so avoiding failure was very important. However, today, innovation can be done at a low cost and can be done easily.

The fifth key is Value. Traditionally, the value proposition of a company is considered something relatively constant. Products may be updated, marketing campaigns updated, or operations improved, but the value offered by a business to customers is considered something constant and defined by the industry it operates (for example, automotive companies offer transportation, safety, comfort, and status, to varying degrees). A successful business has a clear value proposition, finding a point of difference in the market (e.g., price or brand). In the digital age, the value proposition has not changed, focusing only on challenges

and disruptions by business competitors. The value proportion of a product is determined by customer desires and can provide added value to customers.

There is another concept that provides an opinion that a company leader conducts digital transformation focusing on three elements: customer experience, company operational processes, and organization/company business models (Westerman et al., 2011). Digital transformation has a major impact on organizations, industries, and society (Henriette et al., 2015). There are 3 (three) pillars, each pillar has 9 important elements, and each element has 2 3 keys to digital transformation. These nine elements form a building block for digital transformation. A leader prefers several blocks of elements that are in line with his business organization. The 10th element is very important, namely digital capabilities because this element can transform all existing elements.

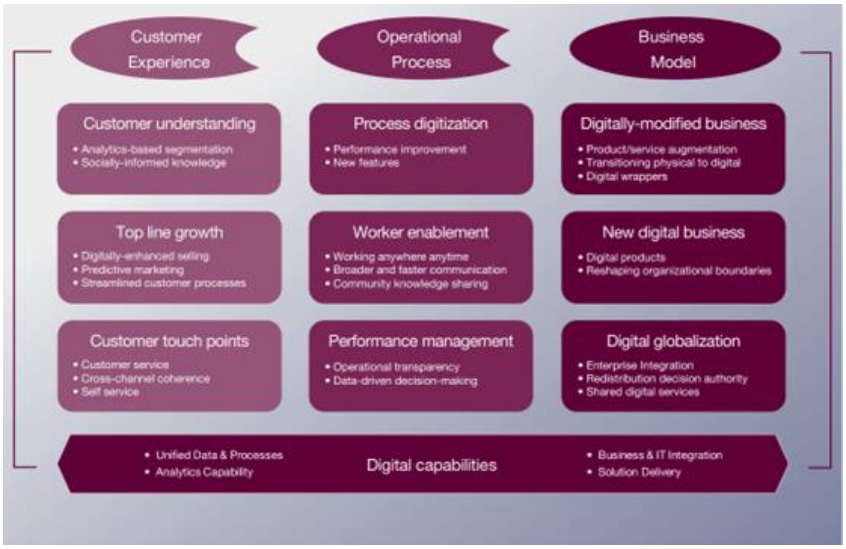


**Figure 5.** Pillars of Digital Transformation

The first pillar: Customer Experience. In this pillar, the focus is on understanding customer desires. Customer desires include analytics-based segmentation and knowledge based on social information. A company begins to leverage its previous investments to gain a deeper understanding of its customers' regions and conditions. This means that the company is using existing systems to gain a deeper and more detailed understanding of specific regions and market segments. The second element is revenue growth. The company uses technology to increase its sales face-to-face. There are various ways to increase sales by engaging with customers. A better understanding of customers and existing business processes helps companies to change sales methods. The company integrates customer purchase data to increase sales and more personalized customer service.

Second pillar: The company's operational processes. In this operational pillar of a company's business processes, in addition to optimizing changes to the customer experience. Digital transformation also focuses on transforming the internal processes of an organization. Indeed, companies have used automation to make business processes more efficient and improved. For example, the implementation of ERP makes the company experience a significant increase in efficiency and quality in the transaction, financial, and supply chain processes. With the growing technology, the trend of business optimization processes is increasingly sustainable in gaining business process efficiency. Automation allows companies to assign tasks to employees with more strategic and specific tasks. Automation in companies allows researchers to focus on innovation and creativity in the company's business processes.

The third pillar is the business model. In this operational pillar of a company's business processes, in addition to optimizing changes to the customer experience. A media executive said: We realized that if we don't change the way we do business, we will die. It's not about changing the way we use technology, but about changing the way we do business. Other companies change their business model by changing their business concept using digital technology. With a change in business model, a company can transform from a national company to a multinational, from a multinational to a global company. Digital technology

developed with integrated information, provides opportunities for companies to have global synergies by prioritizing national-scale business concepts.

The goal of digital transformation for companies is to save expenses by creating good digital services so that people are able and easy to use. For example, Amazon and Netflix do not need to provide training on how to use their services; creating good services actively responds to user needs dynamically, with intuitive interfaces. These services have become the gold standard for doing business; it is this innate digital transformation that stakeholders, especially in the health sector, need to emulate. However, digital governance and ownership is still in its infancy in many organizations, both in the private and government sectors. Transitioning to a mature digital governance model in long-established organizations is a complex and disruptive journey.

A poll of dermatological students in the UK during COVID-19 revealed an increasing need for the usage of digital technology that patients and physicians do not always agree upon. As the COVID-19 pandemic worsens, teledermatology appointments are now available in 100% of dermatological departments, up from 26% in December 2019 (Lowe et al., 2020). Clinical dermatology's utilization of telemedicine and digital technology is evolving quickly in response to the COVID-19 pandemic's shifting needs. The majority of dermatological clinics only provide in-person consultations for urgent referrals. The majority of normal new patient follow-ups and referrals are handled remotely via phone, email, or video consultation.

Stakeholders often have different responsibilities/discretions. Therefore, they have different understandings for realizing varied benefits and information needs and impact different types with different outcomes. For example, service provider organizations prioritize specific service improvements, national program managers seek to demonstrate high-level public benefits for future investments to the treasury and ensure priority for digital transformation. Stakeholders want information for both retrospective assessment of return on investment and prospective validation of business models for future investments. In practice, trying to link program outcomes to the overarching health system mission (e.g., improving population health and efficiency). However, these system benefits may not be immediately felt by the health organization.

Strategies for digital transformation differ in their objectives and points of view. From a corporate standpoint, digital transformation strategies concentrate on how new technology can change an organization's operations, products, and other elements. According to Matt et al. (2015), its scope is intended to be more inclusive and specifically covers digital actions that involve the client or are solely their responsibility. A digital business strategy often outlines the company's plans and intended future commercial potential based on digital technologies. On the other hand, a digital transformation strategy is a plan that helps an organization manage the changes brought about by the incorporation of digital technology, as well as the changes that the company experiences in its business operations following the digital transformation.

The success of digital transformation does not come from the application of new technology, but the success comes from the organizational transformation of a company to take advantage of the possibilities that exist with new technology (Westerman et al., 2011). The success of digital transformation will not happen if it is from the bottom up, instead, there needs to be encouragement from the company's leadership level to subordinates. Focus on the “how” not the “what”. Digital transformation is said to be successful if it focuses on how to drive change. Successful digital transformation is not about creating a new organization, but about how to reshape the organization by leveraging existing strategic assets in new ways.

An example of a failed digital transformation case is General Electronic (GE). GE failed because it experienced internal performance issues and leadership turnover faster than expected before the implementation of large-scale digital transformation. The Lego company stopped funding its virtual digital designer program. Nike reduced its digital unit by half in 2014 by discontinuing its Nike+ Fuelband activity project. Often when companies spend funds to develop their digital products, and infrastructure, and develop their personal brand branding face performance challenges, these challenges come from shareholder disapproval (Davenport & Westerman, 2018).

From the examples of digital transformation failure cases above, success in the digital world does not happen quickly, because digital transformation and large investments in digital technology can take longer than expected. Patience and understanding that the results are not too expecting more is the key that must

be lived. Second, there is a need for business evaluation. A leader needs to carefully evaluate his or her business and consider whether the digital investment is providing a return that is worth the cost. Factors such as return on investment (ROI) time and impact on the business as a whole should be considered. Third, there needs to be a balance between innovation and core business. If digital innovation is important, a leader also needs to ensure that digital efforts do not become a hindrance and do not become the top priority of the company's core business. Fourth, learn from failure. Every failure needs to be seen as an opportunity to learn better in the future in making decisions. It is important to evaluate what is not working and not in line and the need for adaptation of strategies in the future. Fifth, continuous consideration is needed, meaning that companies need to consider the long-term impact of digital investments made and ensure that the resources used in digital investments are proportional to the expected results.

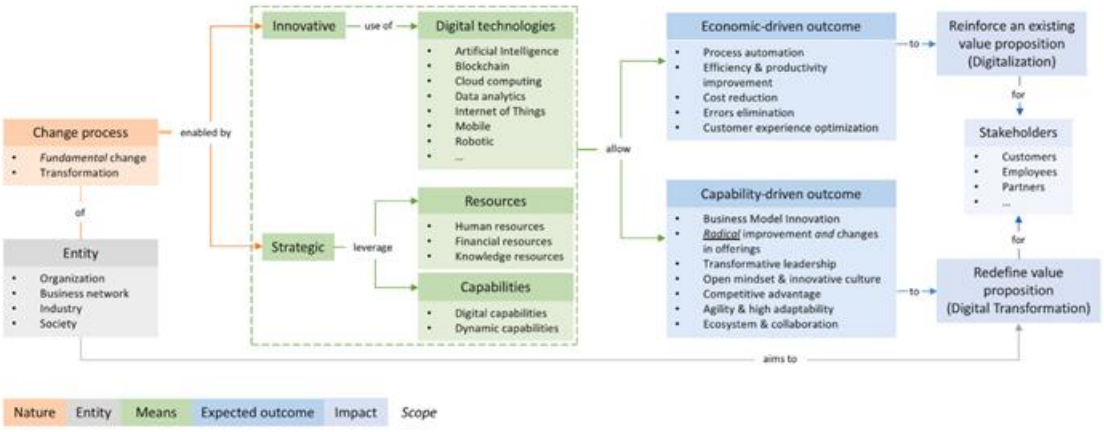


**Figure 6.** Conceptual Diagram Transformation Digital

The conceptual diagram for digital transformation is seen in Figure 6 to illustrate the reasoning behind the six recognized primitives and their distinguishing characteristics (Gong & Ribiere, 2021). It also depicts the fundamentals of DT as well as important components of the DT process. In Fig. 6, we specifically included two categories of anticipated outcomes (e.g., capability-driven and economic-driven outcomes) related to DT and digitalization, respectively. Depending on their aims and the sectors they serve, some businesses may reach DT straightaway, while others may have to start with digitalization projects before achieving DT. The diagram illustrates the comprehensive process and impact of digital transformation on various entities such as organizations, business networks, industries, and society. At its core, the change process is fundamental and transformative, enabled by both innovative and strategic means. Innovative means involve the utilization of digital technologies like Artificial Intelligence, Blockchain, Cloud computing, Data analytics, Internet of Things (IoT), Mobile, and Robotics. On the strategic side, the process leverages resources including human, financial, and knowledge resources, while also developing digital and dynamic capabilities. The expected outcomes of this transformation are categorized into economic-driven and capability-driven outcomes. Economic-driven outcomes focus on process automation, efficiency and productivity improvement, cost reduction, error elimination, and customer experience optimization. On the other hand, capability-driven outcomes aim for business model innovation, radical improvement and changes in offerings, transformative leadership, an open mindset and innovative culture, competitive advantage, agility, and high adaptability, as well as ecosystem and collaboration.

The ultimate impact of these outcomes is to either reinforce an existing value proposition through digitalization or to redefine the value proposition through digital transformation. Reinforcing an existing value proposition focuses on enhancing current processes and offerings to provide greater value to stakeholders such as customers, employees, and partners. Redefining the value proposition involves fundamental changes that create new value propositions, aligning with the transformative nature of the process. Overall, the diagram encapsulates the nature of digital transformation, the entities involved, the means utilized, the expected outcomes, and the overall impact on stakeholders.

## 5. Conclusion

Digital transformation is an unavoidable change in the world of business and society. The success of organizations in the face of these changes lies in the ability to integrate digital technologies in various aspects of operations while developing the right business strategy. Innovation is becoming a key element

in business competition, and while there are challenges such as data security and internal resistance, great opportunities also arise in the form of better customer experience and improved operational efficiency. Constant awareness and commitment to learning are important, and when done right, digital transformation can deliver significant benefits to all stakeholders. Therefore, through proper understanding and strategy, organizations can optimistically face digital transformation and leverage it for future success.

Our work has certain limits. First off, while this study adds to the body of information regarding DT conceptualization, it is important to acknowledge the limitations of qualitative research, namely the absence of preliminary qualitative observation or interview data gathering. However, to provide an overall comprehension of this notion and assist in sorting and reviewing inconsistencies in the existing DT-related literature, we continue to believe that a comprehensive and systematic analysis of current knowledge on DT enhanced with secondary qualitative data is required. Subsequent investigations may assess our cohesive definition using supplementary qualitative observations and a quantitative survey design including a more extensive sample size to verify the methodological soundness and validity of the results.

## Acknowledgment

The completion of this research paper, would not have been possible without the invaluable support and guidance of several individuals and institutions. First and foremost, we would like to extend our deepest gratitude to our advisor, Dr. Stanislaus Riyanta, M.Si, whose expertise, encouragement, and insightful feedback have been instrumental in shaping this work. Your unwavering support and dedication to our academic growth have been truly inspiring. We are also profoundly thankful to the faculty and staff of the School of Strategic and Global Studies, Universitas Indonesia, whose resources and support have been vital throughout this research journey. Additionally, we are grateful to our families and friends for their unwavering support and understanding throughout this process. Your patience and belief in our abilities have been a constant source of motivation.

## References

Agarwal, R., Johnson, S. L., & Lucas, H. C. (2011). Leadership in the face of technological discontinuities: the transformation of EarthColor. *Communications of the Association for Information Systems*, *29*(1), 33.

Al-Ruithe, M., Benkhelifa, E., & Hameed, K. (2018). Key issues for embracing the cloud computing to adopt a digital transformation: A study of saudi public sector. *Procedia Computer Science*, *130*, 1037–1043.

Bekkhus, R. (2016). Do KPIs used by CIOs decelerate digital business transformation? The case of ITIL. *Diffusion Interest Group in Information Technology*, 19. https://aisel.aisnet.org/digit2016/16/

Berman, S. J. (2012). Digital transformation: opportunities to create new business models. *Strategy & Leadership*, *40*(2), 16–24. https://doi.org/10.1108/10878571211209314

Betz, C., Olagunju, A. O., & Paulson, P. (2016). The impacts of digital transformation, agile, and DevOps on future IT curricula. *Proceedings of the 17th Annual Conference on Information Technology Education*, 106.

Bharadwaj, A. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly*.

Bonnet, D., & Westerman, G. (2020). The new elements of digital transformation. *MIT Sloan Management Review*, *62*(2).

Brown, A., Fishenden, J., & Thompson, M. (2014). *Organizational Structures and Digital Transformation BT - Digitizing Government: Understanding and Implementing New Digital Business Models* (A. Brown, J. Fishenden, & M. Thompson (eds.); pp. 165–183). Palgrave Macmillan UK. https://doi.org/10.1057/9781137443649_10

Chanias, S. (2017). *Mastering digital transformation: the path of a financial services provider towards a digital transformation strategy*.

Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *The Journal of Strategic Information Systems*, *28*(1), 17–33.

Davenport, T. H., & Westerman, G. (2018). Why so many high-profile digital transformations fail. *Harvard Business Review*, *9*(4), 15.

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*, *55*(2), 1.

Gaivoronskii, D. V, Kutuzov, V. M., Minina, A. A., & Herbert, L. (2017). Digital transformation: Build your organization's future for the innovation age. *2017 IEEE VI Forum Strategic Partnership of Universities and Enterprises of Hi-Tech Branches (Science. Education. Innovations)(SPUE)*, 3–6.

Gassmann, O., & Frankenberger, K. (2014). *The Business Model Navigator ePub eBook: The Business Model Navigator: 55 Models That Will Revolutionise Your Business*. Pearson UK.

Goerzig, D., & Bauernhansl, T. (2018). Enterprise architectures for the digital transformation in small and medium-sized enterprises. *Procedia Cirp*, *67*, 540–545.

Gong, C., & Ribiere, V. (2021). Developing a unified definition of digital transformation. *Technovation*, *102*, 102217.

Goran, J., LaBerge, L., & Srinivasan, R. (2017). *Culture for a digital age*.

Gray, J., & Rumpe, B. (2017). Models for the digital transformation. In *Software & Systems Modeling* (Vol. 16, pp. 307–308). Springer.

Gruman, G. (2016). *What digital transformation really means*. https://www.infoworld.com/article/3080644/what-digital-transformation-really-means.html

Haffke, I., Kalgovas, B. J., & Benlian, A. (2016). *The Role of the CIO and the CDO in an Organization's Digital Transformation*.

Hartl, E., & Hess, T. (2017). *The role of cultural values for digital transformation: Insights from a Delphi study*.

Heilig, L., Lalla-Ruiz, E., & Voß, S. (2017). Digital transformation in maritime ports: analysis and a game theoretic framework. *NETNOMICS: Economic Research and Electronic Networking*, *18*(2), 227–254. https://doi.org/10.1007/s11066-017-9122-x

Henriette, E., Feki, M., & Boughzala, I. (2015). *The shape of digital transformation: A systematic literature review*.

Herbert, L. (2017). *Digital transformation: Build your organization's future for the innovation age*. Bloomsbury Publishing.

Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive*, *15*, 123–139.

Horlacher, A., & Hess, T. (2016). What does a chief digital officer do? Managerial tasks and roles of a new C-level position in the context of digital transformation. *2016 49th Hawaii International Conference on System Sciences (HICSS)*, 5126–5135.

Iansiti, M., & Lakhani, K. R. (2014). Digital ubiquity:: How connections, sensors, and data are revolutionizing business. *Harvard Business Review*, *92*(11), 19.

Ismail, M. H., Khater, M., & Zaki, M. (2017). Digital business transformation and strategy: What do we know so far. *Cambridge Service Alliance*, *10*(1), 1–35.

Janowski, T. (2015). Digital government evolution: From transformation to contextualization. In *Government information quarterly* (Vol. 32, Issue 3, pp. 221–236). Elsevier.

Korhonen, J. J., & Halén, M. (2017). Enterprise architecture for digital transformation. *2017 IEEE 19th Conference on Business Informatics (CBI)*, *1*, 349–358.

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. *Sage Open*, *11*(3), 21582440211047576. https://doi.org/10.1177/21582440211047576

Legner, C., Eymann, T., Hess, T., Matt, C., Böhmann, T., Drews, P., Mädche, A., Urbach, N., & Ahlemann, F. (2017). Digitalization: Opportunity and Challenge for the Business and Information Systems Engineering Community. *Business & Information Systems Engineering*, *59*(4), 301–308. https://doi.org/10.1007/s12599-017-0484-2

Leodolter, W. (2017). *Digital transformation shaping the subconscious minds of organizations: Innovative organizations and hybrid intelligences*. Springer.

Liu, D., Li, S., & Yang, T. (2012). Competitive Business Model in Audio-book Industry: A Case of China. *Journal of Software*, *7*(1), 33–40.

Loebbecke, C., & Picot, A. (2015). Reflections on societal and business model transformation arising from digitization and big data analytics: A research agenda. *The Journal of Strategic Information Systems*, *24*(3), 149–157. https://doi.org/https://doi.org/10.1016/j.jsis.2015.08.002

Lowe, A., Pararajasingam, A., & Goodwin, R. (2020). A UK-wide survey looking at teaching and trainee confidence in teledermatology: a vital gap in a COVID-19-induced era of rapid digital transformation? *Clinical and Experimental Dermatology*, *45*(7), 876–879.

Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & Information Systems Engineering*, *57*, 339–343.

Mazzone, D. M. (2014). *Digital or death: digital transformation: the only choice for business to survive smash and conquer*. Smashbox Consulting Inc.

McDonald, M. P., & Rowsell-Jones, A. (2012). *The digital edge*. Gartner, Incorporated.

Morakanyane, R., Grace, A. A., & O'reilly, P. (2017). *Conceptualizing digital transformation in business organizations: A systematic review of literature*.

Nwankpa, J. K., & Roumani, Y. (2016). IT Capability and Digital Transformation: A Firm Performance Perspective. *International Conference on Interaction Sciences*.

Paavola, R., Hallikainen, P., & Elbanna, A. R. (2017). Role of Middle Managers in Modular Digital Transformation: the Case of Servu. *ECIS*, 58.

Roedder, N., Dauer, D., Laubis, K., Karaenke, P., & Weinhardt, C. (2016). The digital transformation and smart data analytics: An overview of enabling developments and application areas. *2016 IEEE International Conference on Big Data (Big Data)*, 2795–2802.

Rogers, D. (2016). *The Digital Transformation Playbook Rethink Your Business for the Digital Age* (NV-1 Onl). Columbia University Press New York, NY.

Rowe, P. S. (2017). Transformative Apostrophe: Astonishing Effects of Assimilation in Shelley's "Ode to the West Wind." *Literary Imagination*, *19*(1), 30–53. https://doi.org/10.1093/litimag/imx021

Selander, L., & Jarvenpaa, S. L. (2016). Digital Action Repertoires and Transforming a Social Movement Organization. *MIS Quarterly*, *40*(2), 331–352.

Siebel, T. M., & Rice, C. (2019). *Digital Transformation Survive and Thrive in an Era of Mass Extinction* (NV-1 onl). RosettaBooks Newburyport.

Solis, B., & Szymanski, J. (2016). The six stages of digital transformation. *Altimeter Prophet*.

Stock, J. R., & Boyer, S. L. (2009). Developing a consensus definition of supply chain management: a qualitative study. *International Journal of Physical Distribution & Logistics Management*, *39*(8), 690–711. https://doi.org/10.1108/09600030910996323

Stolterman, E., & Fors, A. C. (2004). *Information Technology and the Good Life BT - Information Systems Research: Relevant Theory and Informed Practice* (B. Kaplan, D. P. Truex, D. Wastell, A. T. Wood-Harper, & J. I. DeGross (eds.); pp. 687–692). Springer US. https://doi.org/10.1007/1-4020-8095-6_45

Suddaby, R. (2010). Editor's comments: Construct clarity in theories of management and organization. In *Academy of management review* (Vol. 35, Issue 3, pp. 346–357). Academy of Management Briarcliff Manor, NY.

Van Veldhoven, Z., & Vanthienen, J. (2022). Digital transformation as an interaction-driven perspective between business, society, and technology. *Electronic Markets*, *32*(2), 629–644.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, *28*(2), 118–144.

Wacker, J. G. (2004). A theory of formal conceptual definitions: developing theory-building measurement instruments. *Journal of Operations Management*, *22*(6), 629–650. https://doi.org/https://doi.org/10.1016/j.jom.2004.08.002

Wang, Y., Kung, L., & Byrd, T. A. (2018). Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological Forecasting and Social Change*, *126*, 3–13. https://doi.org/https://doi.org/10.1016/j.techfore.2015.12.019

Westerman, G., Bonnet, D., & McAfee, A. (2014). The nine elements of digital transformation. *MIT Sloan Management Review*, *55*(3), 1–6.

Westerman, G., Calméjane, C., Bonnet, D., Ferraris, P., & McAfee, A. (2011). Digital Transformation: A roadmap for billion-dollar organizations. *MIT Center for Digital Business and Capgemini Consulting*, *1*, 1–68.

White, M. (2012). Digital workplaces: Vision and reality. *Business Information Review*, *29*(4), 205–214. https://doi.org/10.1177/0266382112470412

Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. M. (2013). Using grounded theory as a method for rigorously reviewing literature. *European Journal of Information Systems*, *22*(1), 45–55.

Zaoui, F., & Souissi, N. (2020). Roadmap for digital transformation: A literature review. *Procedia Computer Science*, *175*, 621–628.