



**Review Article**

# Digital Transformation: Opportunities and Challenges for Leaders in the Emerging Countries in Response to Covid-19 Pandemic

Thanh Nguyen Hai <sup>1\*</sup>, Quang Nguyen Van <sup>1</sup>, Mai Nguyen Thi Tuyet <sup>1</sup>

<sup>1</sup> *Institute of Leadership and Public Policy, Ho Chi Minh National Academy of Politics, Hanoi, Vietnam*

## Abstract

Digital transformation is in a period of strong development, playing an important role in the development of public and private organizations. Its implications are still being clarified. However, up to now, the category of digital transformation has many different conceptions. Therefore, the objective of the paper contributes to the interpretation and discovery of the perception of digital transformation, the cognitive development of digital transformation, the positive aspects of the digital transformation process, the achievements achieved, the urgency of the digital transformation before the impact of the Covid-19 pandemic and challenges and limitations in the initiative of the contingent of civil servants and leaders in the digital transformation process. The research method is mainly based on the available documents from journals, books, research works, and the views of the authors expressed on the websites as a basis for making the analysis evaluate. The discoveries in the research will contribute to building the theoretical basis and direction in making some suggestions for leaders. In practical terms, research has shown that digital transformation can be a challenge, but perceive and prepare for leadership thinking innovation that drives successful digital transformation across countries, especially emerging countries is essential.

## Keywords:

Digital Transformation;  
Opportunities and Challenges;  
Emerging Countries;  
Covid-19 Pandemic.

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## 1- Introduction

The recent explosion in the adoption of digital technology has put this topic at the forefront of debates. Digital transformation affects everyone and in most areas of activity [1], the power of digital technology can apply to every aspect of an organization [2], but in this paper, we only cover organizational changes. Organizations are forced to adapt to new ways of doing things, mostly related to the digital transformation the world has been experiencing, from artificial intelligence (AI) to blockchain and internet of things (IoT). Digital transformation is vital for public and private organizations of all sizes, especially for businesses that are at risk of being wiped out without digital transformation [3]. Digital is having a strong impact on all fields, the impact will increase strongly in the future, developing countries cannot ignore this trend [4]. Because of the important nature of the digital conversion, it is also seen as a catalyst for change [5], even some authors do not give a specific opinion but suggest that digital transformation is related to new digital technologies and strategic changes in organizations, innovation, and capacity of organizations and individuals [6, 7].

The widespread and popular digitalization has brought about breakthrough changes to the economy [8]. Digital technologies, digital and digital innovations are fundamentally changing business processes, products, services, and relationships [9], and organizations need to fundamentally change the way they do business and thinking of the team of leaders as well as restructuring to survive [10]. A clear definition of digital transformation is lacking [11], so far,

\* **CONTACT:** Thanhhaith@gmail.com

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however, researchers often describe digital transformation as a major organizational change-driven built or triggered by the public technology, changing the way business is conducted [12]. The concept of digital transformation is often used in place of concepts such as digitization and digital innovation, although some similarities exist, the use of the term needs consistency, Osmundsen et al. (2018) [13] proposed that digital transformation is a process at the same time combining digital technology in new ways or with physical components that enable social change and create new values for users. Digital transformation is also emphasized in its ability to improve existing processes, and the team business model that can change under the impact of digital transformation [14].

Digital transformation has been a strong influence on the world economy, especially when the pandemic is happening, digital transformation is an indispensable trend, but the analysis, control, and processing of blocks. Growing large amounts of data is not an easy task [15]. Recently, the research and testing of issuing digital currencies have become a trend in many countries around the world. Some Asian countries have started researching and testing digital currencies, and some countries are not ready to test and release this currency. But in reality, it is very difficult for a country to go against this trend or completely ban the circulation of digital currency because it has no borders. Instead, governments need to increase cooperation in the research and issue a digital currency [16]. However, early warnings about cryptocurrencies are being exploited for money laundering or other criminal activities [17].

The strategies that make up the achievements that many countries have so far may not have the same effect in the future because of changes in international integration and digital technology development. Aware of this, leaders of many public and private organizations, some countries, are making heavy investments by deciding to move towards digital development [18]. Shifting the focus is on efficiency, improving leadership capacity to adapt to the digital transformation context [5]. The greater the efficiency and satisfaction with leadership, the higher the digital leadership skills are [19]. Before the Covid-19 pandemic appeared and spread, private organizations, as well as organizations providing public services, developed a digital transformation strategy to develop organizations [20]. As the Covid-19 pandemic covered much of the world, organizations and governments were forced to rethink their operating models to ensure the crisis-affected organizations, governments, and citizens. At least, it is time for organizations and governments to realize the importance of digital transformation, which is gradually reshaping how public services such as health, education and communication are delivered [21]. Therefore, digital transformation is an increasingly popular trend that cannot be ignored by any individual, organization or country. Furthermore, the question of how digital transformation is and what factors are central to digital transformation remains unanswered and this leaves a gap in the perception of organizations that needs to be answered [22]. To implement the research framework, the paper is presented according to the analytical structure, the explanation of the digital transformation, the context that drives the digital transformation, the achievements and challenges of the current digital transformation process, some suggestions for leaders in digital transformation.

## 2- Research Methodology

This paper is based on an extension of a systematic literature review of digitization, initially investigating how digitization is conceptualized in current research. The mixed research methodology has been applied, but the focus will be on qualitative research [23], with a greater emphasis on qualitative research methodology due to the understanding that it is more appropriate when the purpose is the study of phenomena associated with the stability and development of the organization [24]. It is also the most suitable approach to discover phenomena and solve emerging questions [25].

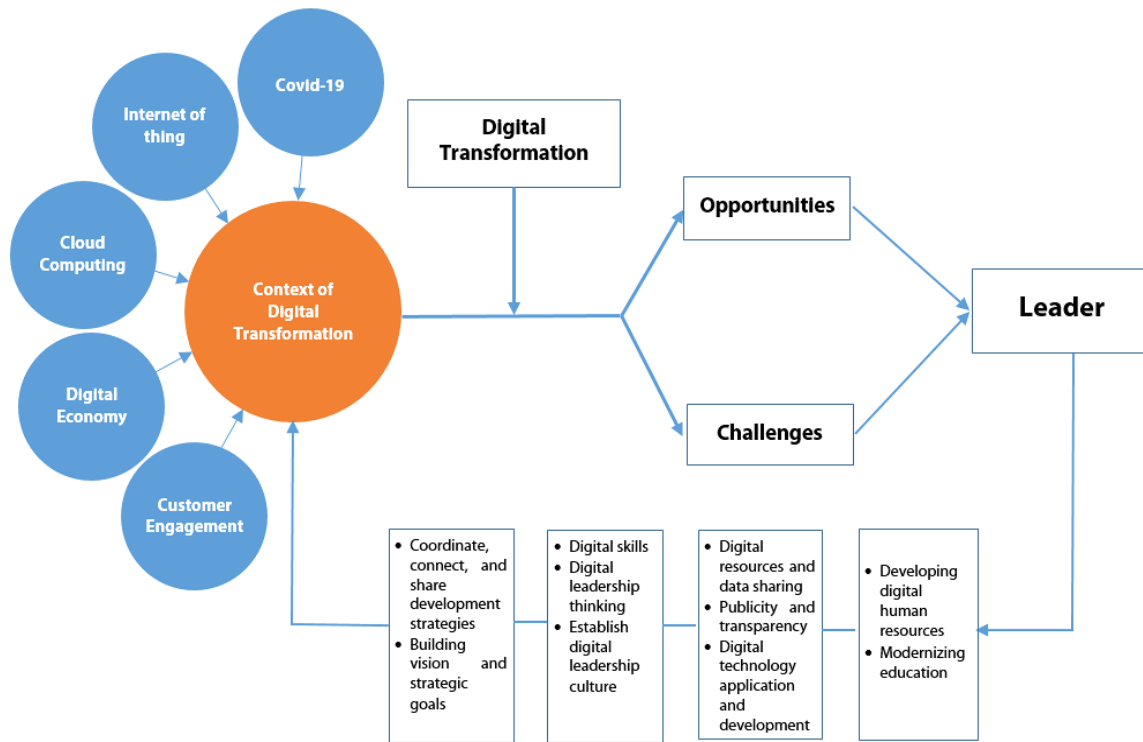
On the other hand, following a systematic document review method, strictly adhering to a series of scientific methods to limit systematic error, mainly by trying to determine evaluation and synthesis of all relevant studies [26]. Conducting assessments provides the best evidence to inform academics and practitioners by adopting "a scalable, scientific and transparent process" [27]. In order to reduce potential bias, we take an approach that focuses on analyzing the content of existing documents [28], and researching numerical conversion based on a document review relevant to the topic [29] through the use of resources from the Web of Science and Scopus databases, Google Scholar, Researchgate, etc. The analytical process is shown in Figure 1.

We use the term "Digital transformation" in our subject (title, summary, and keyword). Although different keywords can be considered a suitable solution in this study, so "digital transformation" is the problem we study. On the basis of exploring available resources to answer three research questions:

*Q1: Why do organizations and emerging countries need to implement digital transformation before the impact of the Covid-19 pandemic?*

*Q2: How does digital transformation affect organizations and emerging countries in the Covid-19 pandemic?*

*Q3: How can organizations and countries carry out successful digital transformation in the Covid-19 pandemic?*



**Figure 1. Flowchart of the literature review procedure.**

### 3- Digital Transformation

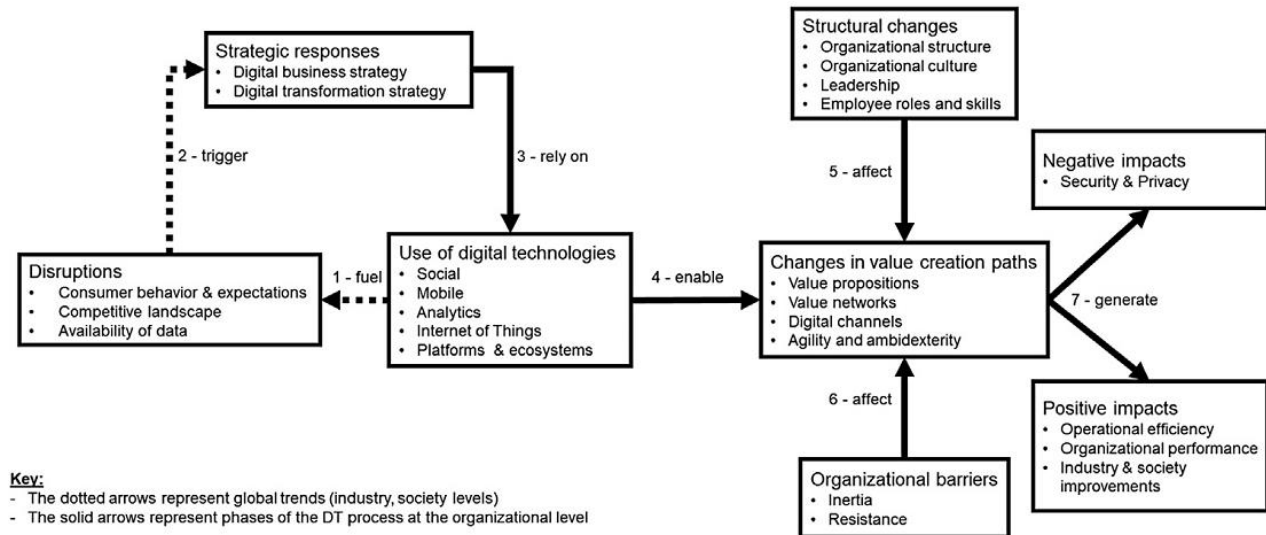
Up to now, there are many different notions for the term of digital transformation, the terms of digitalization and the digital age are often used interchangeably [30]. Some of the concepts that refer to digital transformation can be seen in the table below about digital conversions. Kokkinakos et al. (2016) [31] argued that modern technologies helped to revolutionize the daily operations of modern organizations at all levels. Digital transition is becoming more and more popular. So far, many authors have tried to define the exact concept of digital transformation but there is no widely accepted official concept, so its boundaries are often blurred.

**Table 1. Definitions related to digital transformation terms [32, 33].**

References	Definition
Stolterman & Fors (2004) [34]	Digital transformation is the changes that digital technology causes or influences in all aspects of human life.
Martin (2008) [35]	Digital Transformation is now commonly interpreted as such usage of information and communication technology, when not trivial automation is performed, but fundamentally new capabilities are created in business, public government, and people's and society life.
Westerma, et al. (2011) [36]	"Digital transformation (DT)—the use of technology to radically improve the performance or reach of enterprises—is becoming a hot topic for companies across the globe. Executives in all industries are using digital advances such as analytics, mobility, social media, and smart embedded devices—and improving their use of traditional technologies such as ERP—to change customer relationships, internal processes, and value propositions".
McDonald & Rowsell-Jones (2012) [37]	As such, the digital transformation goes beyond merely digitizing resources and results in value and revenues being created from digital assets.
Fitzgerald, Kruschwitz, Bonnet & Welch (2013) [38]	Use of new digital technologies, such as social media, mobile, analytics, or embedded devices, in order to enable major business improvements like enhancing customer experience, streamlining operations or creating new business models.
PwC (2013) [39]	Digital transformation describes the fundamental transformation of the entire business world through the establishment of new technologies based on the internet with a fundamental impact on society as a whole.
Mazzone (2014) [40]	Digital transformation is the deliberate and ongoing digital evolution of a company, business model, idea process, or methodology, both strategically and tactically.
Digitale Wirtschaft (2015) [41]	Digitization stands for the complete networking of all sectors of the economy and society, as well as the ability to collect relevant information and to analyze and translate this information into actions. The changes bring advantages and opportunities, but they create completely new challenges.
Schweer & Sahl (2016) [42]	We understand digital transformation as consistent networking of all sectors of the economy and adjustment of the players to the new realities of the digital economy. Decisions in networked systems include data exchange and analysis, calculation and evaluation of options, as well as initiation of actions and introduction of consequences.

Kotarba (2018) [43]	The digital transformation can be defined as the modification (or adaptation) of business models, resulting from the dynamic pace of technological progress and innovation that trigger changes in consumer and social behaviors.
OECD (2019) [44]	Digital transformation is the result of digitization and digitalization of economies and societies.
Vietnamese Government (2019) [45]	Digital transformation is the use of data and digital technologies to holistically and comprehensively change all aspects of our socio-economic life, reshaping the way we live, work, and relate together.
Kozarkiewicz (2020) [1]	Digital transformation is a process in which digital technologies play a central role both in creating and strengthening disruptive changes taking place in industry (sector) and in society.

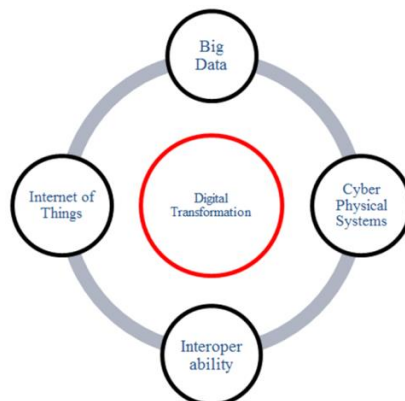
Kozarkiewicz (2020) emphasizes that disruption can drive strategic responses, organizations increase competitiveness, use digital technologies to create new higher value and to achieve entry strategic goals, and overcoming barriers in the digital transformation process need structural change [1]. These changes not only lead to positive organizational results but can also be accompanied by undesirable outcomes, Vial's point [46] is illustrated in the Figure 2:



**Figure 2. Building blocks of the digital transformation process [46].**

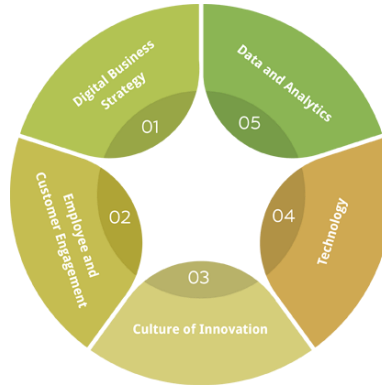
In general, digital transformation is formed by the consolidation of information technology environments such as social technology, cloud computing and internet of things [47], also considered the integration of digital technology with the operational processes of the digital economy [48]. At times, this concept is even extended to the connotation that digital transformation is the ability to comprehensively innovate to improve the operational capacity of projects [49]. From a business perspective, digital transformation encompasses three organizational aspects: an external aspect, an emphasis on enhancing customer experience, from an internal perspective that is business goals, structural leadership version, decentralized in the organization. When parts of the organization are in operation, they often lead to completely new models under the influence of digital transformation [50]. Digital transformation is the process of using digital technologies to create or adapt existing business processes, cultures, and experiences to respond to changing leadership contexts. This change in the digital age is seen as a digital transition [51].

Digital transformation is pervasive and can be understood as changes that digital technology causes or affects every aspect of human life [52]. The elements of digital transformation performed in several studies include four factors: internet of things, big data, cybernetics and interoperability (Figure 3) [53]. Such technologies have the potential to create a significant paradigm change in social life.



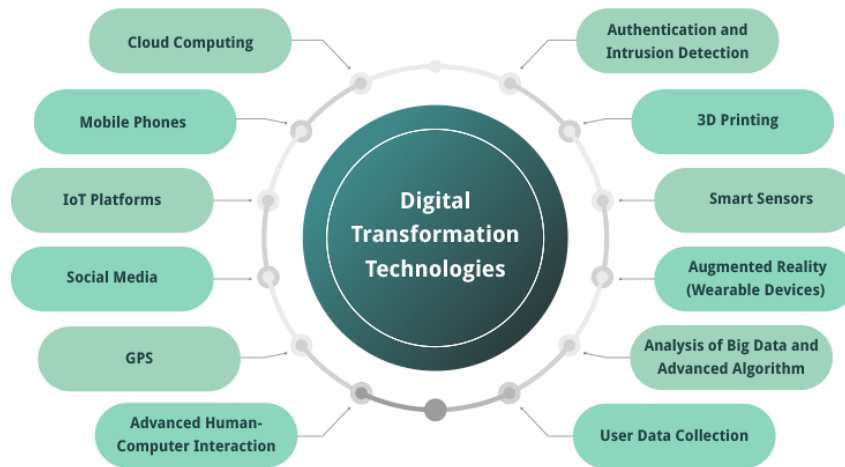
**Figure 3. Factors of digital transformation [53].**

Digital transformation fundamentally changes the way of working based on the application of technology in a faster and better way to serve society, while at the same time contributing to the promotion of cultural innovation in the workplace as well as facilities such as infrastructure, operational models to improve labor productivity. On the other hand, it contributes to new shaping the way people live, work, think, interact, and constantly pursue the reform of practical experiences, newly born services contribute to improving labor efficiency. In addition, services in the fields of health, education and security achieve a radical change in the way people work based on the application of modern technologies, it also helps leaders to increase the ability to predict and plan for the future to achieve the desired progress, build staff to work in a modern and sustainable working environment [54], so many factors are involved digital transition (Figure 4).



**Figure 4. Essential elements of digital transformation technologies [54].**

Today, digital transformation affects every aspect of an organization, so organizations must constantly be aware of this in order to drive change is necessary, it is not a destination, but rather a journey [55], in which new technologies will evolve constantly, to increase the value of the organization itself but also increasing the value of the society (Figure 5).



**Figure 5. Digital transformation technologies according to GOV.SA [54].**

Awareness of digital transformation is increasingly enriching, even factors in digital transformation increase constantly, this affirms its important value to life [56], and advancement of technology. Then the addition of the values that make up the digital transformation is also therefore constantly being expanded.

#### 4- Background that Drives Digital Transformation

Countries, especially developing countries are in a strong digital transformation process, some sectors have been proactive and active such as banking, finance, transportation, public services. They make efforts to direct all levels of government to build e-government, towards the digital government. In particular, in the face of the Covid-19 epidemic, leading to an increase in leadership, digital transformation has promptly met several leadership challenges in response to the pandemic and development of social leadership. Some authors have predicted that digital transformation will thrive after the passing of the Covid-19 pandemic. Facing this fact, many businesses and agencies, including the public and private sectors, intend to build smart organizations based on digital technology. However, most enterprises, both public and non-state enterprises, especially small and medium enterprises, are not fully aware of the role of digital transformation [57].

Currently, small and medium enterprises in developing countries account for a large proportion of the total number of enterprises, but most of them are not ready to participate deeply in the digital transformation process, furthermore, the level of science, technology and transformation and innovation is still low, for example in Vietnam 80 to 90% of the machines used in public sector enterprises are imported and are all technologies from the 1980s to 1990s [58]. In addition, small and medium enterprises are facing barriers in the digital transformation process such as a lack of skills in the workforce, a lack of an information technology platform strong enough to enable successful digital transformation, especially a lack of leadership with adequate digital thinking, and challenges of culture, digital technology in enterprises... However, to adapt to the digital transformation, businesses are gradually participating in digital transformation, investing in cloud computing technology, network security, and artificial intelligence [57].

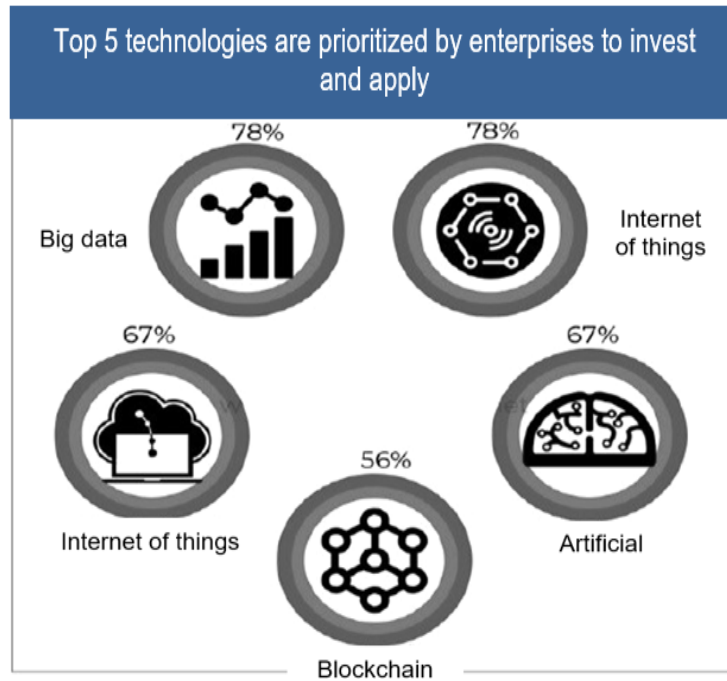
According to the report "the status of digital business transformation in 2018" of IDG (USA), 55% of startups have actively applied digital technology to operate their businesses compared with 38% of traditional enterprises, which contributes to an increase of 34% in revenue. In particular, Big Data, mobile technology, personal cloud storage, public cloud storage, application programming interfaces and embedded technology (40%) are the technologies with a remarkable increase and are being strongly adopted by businesses [59]. However, in the public sector, including public enterprises, administrative agencies have not really promoted digital transformation with specific actions, even though these countries all have strong political determination and cause. It is because agencies believe that digital transformation can cause disruption in personnel, especially long-term positions or leaders and organizations that are not ready to invest in modern technology due to the cost of spending. The budget is quite high. One of the biggest problems facing public sector organizations is the lack of the right strategy to successfully implement new technologies [60]. The structure of information and communication technology revenue is currently mainly contributed by foreign direct investment enterprises, export revenue contributes mainly to the total revenue, while the value-added ratio brings not high [58]. The environment for digital start-ups is not yet attractive, the trend of young people starting to start a business in other countries to register for a company has increased recently [61]. What's more, the challenges that hinder digital transformation in many countries, especially in digital commerce, and the policies that support innovative startups are the mindset of leaders that are not really open [62]. Many organizations still cannot grasp the digital transformation process, especially in terms of technology, so they cannot plan their strategies, goals are not met, and it leads to easy abandonment of projects [60].

Public sector agencies' activities in the information and communication technology sector have been applied to e-government development, contributing to administrative reform, but the results have not been impressive, the number of applications processed. Online processing is still at a low level, the processing of operating through the network is still limited; National databases have been slowly deployed. Moreover, the connection and sharing of data among state agencies are still limited, and the application of advanced digital technology to change the working model and method is not much. Most of the application and development of information and communication technology is not really digital transformation, has not yet created a breakthrough transformation in terms of models, production processes, products based on data and digital technologies [57]. In general, there are a number of relatively positive points in the public sector, the application and development of information and communication technology have been paid attention and spread across many areas that need to be transformed, contributing to improving the quality of people's life, reducing social gaps, especially in the fields of education and health [57]. After decades of backwardness, governments are working hard and step by step to promote rapid digital transformation thanks to advances in digital identity, population rights and digital lifestyles, seeing digital transformation as the key to boosting the economy [62].

As public administrations have begun to digitally transform, private sector firms engaged in the process earlier, especially in information and communication technology, have achieved growth. High turnover, high export value, the average annual growth rate of about 20-30% thanks to accelerating the implementation of digital transformation. From 2010 up to now, the scale of the information and communication technology industry achieved the fastest growth rate with 16 times [46]. In private enterprises, new technologies are being prioritized for investment, such as big data analysis, internet of things, cloud computing, artificial intelligence and blockchain (Figure 6).

Digital transformation drives organizations towards fundamental change in the organization, to strategy and organizational structure [20], but also in the distribution of power [64]. Therefore, organizations must redesign their strategy, organizational structure, allocation of power and initiate an innovation process related to new leadership methods, it is certainly a challenging learning process with each leader and each organization to adapt to the digital transition [65]. On the other hand, digital transformation can be applied at both organizational and individual levels, which is a great advantage, so organizations need to change operating modes, leaders need to proactively absorb and adapt. To achieve efficiency in the digital age became a popular phenomenon [66]. In fact, there is still confusion that a digital leader is the leader of a business or an organization engaged in digital activities. However, a digital leader should be understood as someone with digital skills (digital knowledge) with business knowledge and strategic thinking. According to Antonopoulou et al. (2021) [66], the digital leader is characterized by strategic leadership, business knowledge to add value to the organization, and digital comprehension to exploit technology trends.





**Figure 6. Top 5 technologies that enterprises are prioritizing to invest and apply [63].**

By the end of 2020, the great crisis caused by Covid-19 caused strong disturbances in the social life on a worldwide scale, forcing countries to enter a period of accelerating the application of digital technology [67]. Before the pandemic, some organizations understood the importance of digital transformation and have pursued these strategies to improve organizational aspects [50], but its implementation has been slow for most of the time. Due to the high cost of infrastructure investments, the leadership team cannot lead the digital leadership [68], the emergence of Covid-19 spurred the digital transformation into an urgent matter can not hesitate [69]. This is also an important warning for leaders and governments. In particular, the digital transformation taking place in the public sector contributes significantly to improving ways to better serve citizens [70]. Argument shifting takes place in all spheres of life, it affects people and is not limited to just any organization [71]. The success of digital transformation in time to respond to the spread of the Covid-19 pandemic in order to solve the major global challenge in 2020 will increase the acceptance of organizations and governments for digital transformation [21]. From an option, digital transformation has now become a preferred, imperative strategy for all public and private organizations, illuminating the readiness of organizations for digital transformation, governments.

## 5- Advantages and Challenges of Digital Transformation

### 5-1- The Advantages of Digital Transformation

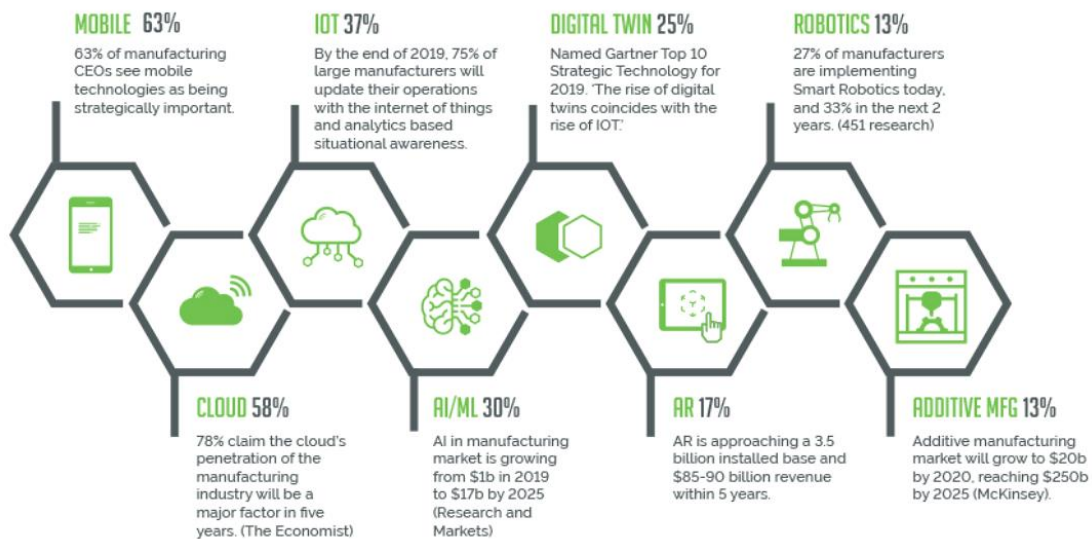
Researchers have confirmed the positive effects of firms' digital transformation on productivity and performance at the macro level [72]. According to GOV.SA [54], digital conversion has the following basic advantages:

- Replace traditional workflow with digital processes;
- Increase the time spent on researching a new development strategy instead of holding on to achievements;
- Changing the modern and professional working model, constantly improving the spiritual life of employees;
- Increase workflow efficiency and minimize technical errors;
- Apply new services and technologies quickly and flexibly;
- Improve work quality and performance;
- Increase labor productivity and improve the quality and appearance of products;
- Constantly increase beneficiary satisfaction;
- Increase re-investment ability.

Digital transformation presents challenges, but it also creates great advantages. Heinze et al. (2018) [73] highlights of digital transformation: Information within organizations is more easily accessible. Attract leaders who are mindful and conscious of the urgency of digital innovation, and always put leaders in the process of working with the high

creativity of digital transformation versus digital transformation previous attempts to change. Constantly improving old operating processes to practice new digital technologies, thereby encouraging employees to overcome the challenges of old ways of working with new processes, working ways, workforce building and Empower people to work in new ways that align with the goals of digital transformation. Thereby, employees are encouraged to give and practice creative ideas about digital places to be able to support the development of organizations, building learning organizations based on flexible working ways [74].

In the near future, mobile technology with the development of 5G networks will increase the connection of technological equipment; Cloud computing allows increased flexibility, expanding the scope of activities of organizations; internet of things, digital twin, robotics contributing to freeing human labor; Artificial intelligence, augmented reality, additive manufacturing drive increased value of rapid manufacturing operations (Figure 7) [74].



**Figure 7. Technology tools for digital transformation [74].**

Successful digital transformation shows that organizations will deploy many new technologies, especially the ability to use complex technologies, such as artificial intelligence, internet of things. With successful digital transformation posing for leaders to be on a mission level is one of the keys to success in digital transformation. As organizations achieve success in the digital transformation process, it also means that they have created digitally savvy leaders and actively participate in the process [75].

Zero transformation is simply the application and development of information and communication technologies, which is a breakthrough in socio-economic development. At that time, digital data and technology transforms and comprehensively transforms models, processes, products/outputs of production and business processes in society, and at the same time, digital transformation affects more and more to increase domestic growth, labor productivity and employment structure [57]. Digital transformation is a process involving digital technologies, from 5G to artificial intelligence, big data, and blockchain. These technologies form an ecosystem through which future economic and social changes will arise [44].

### **5-2- Challenges from the Digital Transformation Poses for Leaders in the Emerging Countries**

Fundamental requirements of digital technology, intelligent connectivity, and technological changes in digital transformation force public and private enterprises to have drastic transformations in investment and production, business [63]. The key to successful digital transformation has to do with the digital capabilities of the workforce. The first is redefining the roles and responsibilities of the leader so that they align with the goals of the digital transformation process, which can help clarify the roles and capabilities the organization needs. Leaders must foster a sense of urgency to make changes of transformation within the unit. Organizations must develop clear workforce strategies to identify the digital skills and capabilities they currently have and will need to meet their future goals [75].

When planning digital transformation, organizations must take into account the cultural changes they will face as employees and organizational leaders adapt to adopt and rely on unfamiliar technologies [76]. The whole society is facing a radical change due to the development of digital technologies and the widespread deployment of them in all markets [77], organizations are facing competition and exacerbated by globalization [37] and the stress to move digitally before others, seeking to survive and gain competitive benefits [78]. One of the biggest barriers to digital transformation is the change in leaders' minds and perceptions about the importance of digital transformation that has not really changed through practical actions leading numbers must know how to use the latest technologies [79].



The major challenges facing the leaders of organizations in both the public and private sectors facing digital transformation are the lack of skills in the workforce to work in digital environments. Enterprises lack a strong information technology foundation to successfully carry out digital transformation, along with both leaders and staff lack digital thinking, knowledge, skills and skills. As a specific force for digital integration, the most prominent challenge for start-ups is access to finance and limited skills in entrepreneurship and entrepreneurship [80]. Along with that, SMEs, traditional sectors (such as construction, agricultural products, textiles or steel) that fail to adapt will quickly lag in digital transformation [81]. Any organization that resists or does not adapt to this process will inevitably be left behind, collapsed, and unable to survive.

The team led by Antonopoulou et al. (2021) [66] revealed that to overcome the challenges of digital transformation, leaders need to develop digital skills, actively adapt to new situations and practices, as well as dealing with immediate complications. The team also found that leadership results are positively correlated with transition leadership and negatively correlated with passive leadership. The higher the passive leadership level, the less pessimistic the implementation of digital leadership can be. Its means that to be successful in the context of the Covid-19 pandemic still spreading and complicated developments, leaders need to be equipped with appropriate digital skills, contributing to the optimal development of the team.

In the digital transformation process, new technologies and models can be tested, engaging everyone, while preserving the basic human values. To do this, leaders need a comprehensive digital transformation strategy; enhancing smart, public and transparent governance capabilities; building connection infrastructure and network security; building an ecosystem of innovation and entrepreneurship. At the same time, taking advantage of external resources, while making efforts to renew policies, find breakthrough strategies suitable for the new context [82]. This is not easy for leaders in the technological, economic, cultural, social, ethical and legal aspects of leadership and management in the age of digital transformation.

Digital transformation requires a strong, secure, and flexible digital network infrastructure. Recent cyber security incidents risk harming the sustainability and quality of public services, endanger national security and undermine economic growth [83], while Most of the emerging countries are not fully prepared to deal with cybersecurity threats caused by the dispersion of resources, even struggling with the development of a digital economy [84]. On the other hand, for a long time, employees often work according to their habits and do not want to be managed. Another difficulty comes from the leader, a successful leader in digital transformation who has a progressive mindset and is able to maintain the relevance of organizational capabilities in an ever-changing context must possess exceptional qualities, all of which begin with a solid knowledge of digital and new technologies [85]. Another difficulty is that they must have the ability to think strategically, to have a wide influence, to have knowledge and leadership capabilities, and especially to have digital knowledge to improve the performance of the organization, to exploit technology trends such as innovation opportunities, digital leadership skills [66]. In fact, there is still confusion that a digital leader is the leader of a business or an organization engaged in digital activities. However, a digital leader should be understood as someone with digital skills (digital knowledge) with business knowledge and strategic thinking. According to Antonopoulou et al. (2021) [66], the digital leader is characterized by strategic leadership, business knowledge to add value to the organization, and digital comprehension to exploit technology trends.

There is also an attitude of opposition, not support from the staff is one of the major barriers that leaders must find ways to resolve [86]. Most small and medium enterprises lack the capital and technology resources to invest. The experience in production management is weak, has no business strategy, and has limited competitiveness [63]. All these challenges, along with the way of thinking, the limited capacity of digital transformation in leaders are crucial obstacles that make the digital transformation process not keep up with the requirements of reality, which is also the cause. Many countries are lagging in digital transformation.

### ***5-3- Recommendations to Leaders in the Emerging Countries in Digital Transitions***

Digital transformation is happening in most countries across many industries, the process is less risky and simpler than in other countries. However, digital transformation is also a challenge for leaders in poor and developing countries, due to a lack of proper planning and understanding [60]. Furthermore, the more advanced the technology, the greater the associated ethical difficulties, the more organizations have to deal with cybersecurity, privacy, new government regulations, and security confidentiality, concerns about the future workforce [87]. To overcome the challenges of digital transformation, as well as a deeper understanding of digital transformation goals, leaders can rely on a 5-step model to successfully digital transformations from Saldanha's point of view (Figure 8) [88].

Stage 1. The foundation, in this stage, organizations actively automate internal processes to convert manual efforts into data. Stage 2. Siloed, organizations begin to use disruptive technologies to create new possibilities. However, the efforts remain submerged in discrete functions and without the overall strategic transformation of the organization. Stage 4. Fully synchronized, the new digital platform was just formed, but the transition only happened once and did not create a breakthrough but only a small change to not be interrupted. Stage 5. Living DNA, which makes digital capabilities

adapt to new cultures, transformation is sustained because of the discipline of continually innovating and setting new adaptive trends. The leader is not only a leader but also a disciplined innovator [88]. For successful digital transformation, leaders are not only knowledgeable about digital and digital technology, but also must have innovative thinking, always aware of the urgency of scientific and technological innovation, which is the key to successful leadership.

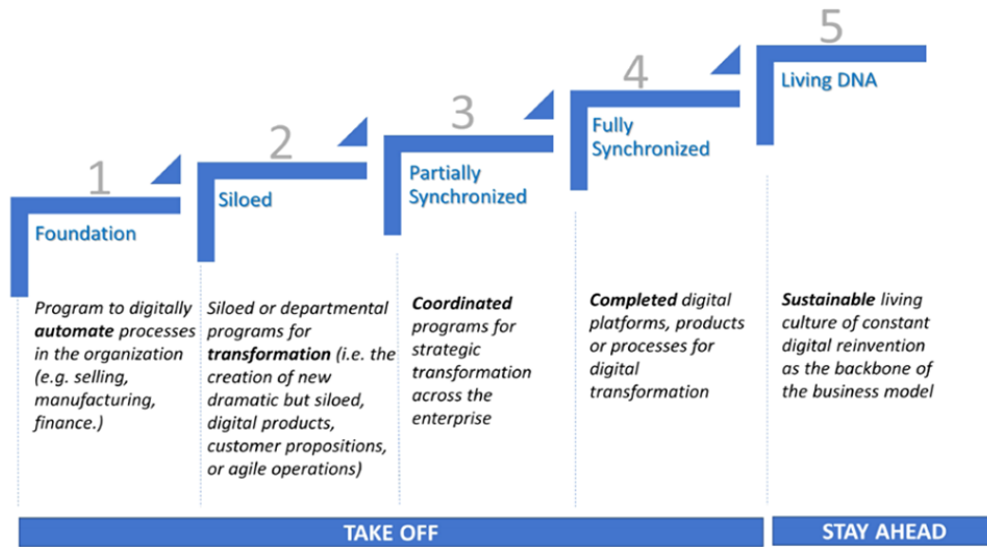


Figure 8. The five stage model for successful digital transformation [88].

Digital transformation is not random, it requires certain principles, a set of ten guiding principles of numerical conversion given by McKinsey (Figure 9).

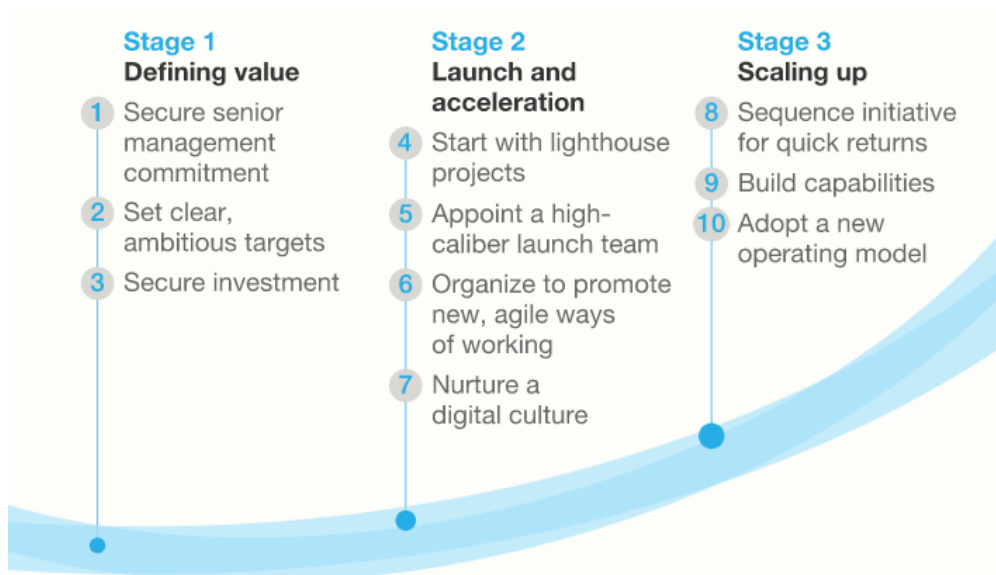


Figure 9. Ten guiding principles of digital transformation [2].

Digital transformation in both public and private sectors in the coming time is indispensable. For successful digital transformation, it is necessary to invest in resources and determination to implement from all sectors of society and specific orientations and solutions.

Firstly, on the national scale, it is necessary to build a strategic joint project to ensure the implementation is synchronous, coordinated, connected, widely and effectively shared, which is the responsibility common to many levels, many branches, and of the whole society, which is not the responsibility of the individual organization or the individual leader. Clearly define the thinking, strategic vision, determine the main goals, orientations, tasks and solutions for state agencies, businesses, organizations and individuals in society to identify and implement the digital transformation plan synchronously, effectively coordinating. In particular, the leader needs to understand what is in the digital transformation strategy and build the strategic direction that is aligned with the overall digital transformation goals, and governments need to commit to providing the conditions, foundations, and the best school for businesses to grow in the digital age [60].

*Secondly*, in order to carry out effective digital transformation, first of all, to improve leadership capacity, leaders must be a pioneer in innovating digital transformation thinking, changing leadership methods and managing work within the organization. Leaders need to be equipped with digital leadership thinking and apply it to the direction and operation of the organization in the chaos of the digital age [89], and then need to raise the level of employees through training programs, fostering digital transformation, establishing an in-house culture, flexible and relentless learning, where employees can continue to adapt to change and thrive [87] along with that is technology innovation. Technologies, digital transformation processes, and people have to go hand in hand to complete effective digital transformation [58].

Some skills that help improve leadership effectiveness in digital transformation are required [89]: 1) Be creative, have this spirit of innovation, think creatively and inspire them to come alive; 2) Catch up, keep up with technology trends, follow the market, talk to experts and other digital leaders; 3) Connecting and sharing with colleagues about their progress, experiences, and best practices will help reduce the pressure because cooperation and human strength are never underestimated; 4) The ability to adapt to changes and respond to a fast-paced world. The digital leader should welcome change, can hone strategies for dealing with the unknown, and change behavior to adapt to new challenges. Do not get too attached to a single plan, the leader should be ready for contingency plans and only see failure as a process, not an endpoint. Being able to anticipate opportunities and develop a strategy that utilizes them is key to business growth; 5) Data-driven Data is the fuel for the digital economy and is the core of driving business transactions in the deepest direction. The leader of digital technology needs an understanding of Big Data, Business Intelligence (BI), Data Science, and Machine Learning.

*Thirdly*, promote the sharing of digital data resources. In the context of digital transformation, digital data plays a very important role, as assets, resources, and prerequisites for successful digital transformation. In recent years, the development of databases in both public and private sectors has been focused, but the national database has been slowly deployed. The connection, sharing and opening of databases of both public and private sectors are very limited, mainly for information. This wastes resources, hindering the application and development of digital technologies [57]. Establish an information system with a fully updated database and publicize the State's undertakings, policies and laws [63].

*Fourthly*, drastically change education and vocational policies, contents and methods to create human resources capable of accepting new production technology trends, in which it is necessary to focus on promoting training to create science and technology. Promote university autonomy, vocational training; piloting regulations on vocational training, university training for some specific disciplines [90]. Young people need to understand and master digital transformation to be able to make informed decisions about how to use digital technology in everyday life in meaningful ways without simply accepting it as it happens [71]. Promptly overcome the situation that the quality and efficiency of education and training are still low compared with the requirements, especially higher education and vocational education. The education and training system lacks the linkage between educational levels and modes of education and training; It is still heavy in theory, light in practice, at the same time strongly shifting the educational process from mainly equipping knowledge to developing comprehensively the capacity and quality of learners. Learning goes together with practice, reasoning is associated with practice [91], so it empowers the younger generation to contact and be more proactive in creating and shaping with the digital transition [92].

## 6- Conclusions

The technological revolution is transforming the world at an unprecedented rate, it is rapidly changing the way organizations at all levels operate, the way people connect and exchange information, and the way they interact with partners in the public as well as the private sector. Governments need to have the right policy framework, leadership in both public and private sectors need digital transformation leadership skills and build the right infrastructure to capture the immense value created by digital transformation, responding promptly to the challenges of the future leadership landscape.

Digital transformation is becoming a popular trend, becoming an indispensable choice for any organization, regardless of size, whether in the public or private sectors. However, changing the argument has many advantages and opportunities, but also many difficulties and challenges, especially for slow and developing countries, because of the limited infrastructure system, laborers lack skills to work in digital networks, leading cadres have not yet adapted to the digital transformation process. However, the responsibility of the leader is to lead the organization to grow, to overcome the challenges posed by digital transformation, leaders first need to equip themselves with full awareness about digital transformation, equipping qualified workers with working skills in a digital environment, and proactively receiving and absorbing the achievements of digital transformation and being ready to face immediate complex issues.

A successful leader in a digital age is a leader with leadership skills, with a digital transformation mindset, who will be able to recognize and take advantage of opportunities to make informed, timely leadership decisions to adjust strategy when risks are detected, making an important contribution to the optimal development of the organization.

## 7- Declarations

### 7-1- Author Contributions

All authors contributed to the design and implementation of the research, to the analysis of the results, and the writing of the manuscript. All authors have read and agreed to the published version of the manuscript.

### 7-2- Data Availability Statement

No new data were created or analyzed in this study. Data sharing is not applicable to this article.

### 7-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

### 7-4- Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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