Business Leaders' Perception of Digital Transformation in Emerging Economies: On Leader and Technology Interplay

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Abstract—The general public dissimilarly interprets the same phenomena in diverse cultures, and leaders' standpoints also differ about these phenomena. Because of unequal advancement and cultural diversity, a specific welfare level or geography perceives digital transformation radically disparate from others. In advanced economies, leaders typically tend to begin to understand the vitality of digital assets. But the understanding may show differences in an emerging economy. Naturally, the factors such as the type of industry and globalization level of the companies can cause these differences. But a survey in a widespread sector can still help to project business leaders' and managers' perceptions of digital transformation in emerging economies, thus pinpointing some of their differences with advanced economies. Two questions come fore at this point: *Do business leaders focus on or are aware of the products and ideas of current technologies,* and *do they appropriately construe these ideas and products?* Interviewing leaders in an emerging economy like Turkey has revealed that they predominantly tend to identify digital transformation with social media. Although digital transformation is related to social media, it is not limited to it. There are state-of-the-art technologies. But in such geographies, leaders require time to possess digital and technological consciousness. On the other hand, in this new world order, leadership has reached a point that there is a need for ultimate leaders. The ones that originate from the very elements of this disruptive environment and the ones that rise with distinguishing skills and epoch-making perspectives. Furthermore, *learning and performance* are indispensable parameters for leaders in times of digital transformation. This article underlines the significant factors that impact these parameters.

Keywords—Leaders' technology perception, technology leader interaction, Technoversal Leader, self-created-problem-solution cycle, APARTS behaviors, vicious cycle

1   Introduction

Technology disrupts businesses, people's lives, and the environment. It also has a profound impact on leaders' perceptions and behaviors. As decision-makers, business

leaders also have the power to affect those phenomena in return. So, their interaction with technology is mutual. The studies are nascent about leader-technology interaction. Leaders, on the other side, divergently interpret technology in distant geographies and cultures. The level of advancement is a fundamental reason for this divergence. In this perceptional difference, leaders' limitations and identification technology with social media also play a significant role in an emerging economy like Turkey.

Leaders compared as follows to help to find the answer to questions and accomplish goals.

 i. Leader opinions from the same geography but different company scales (large global companies versus small-medium local ones)
ii. Leader opinions from different geographies or cultures.

To interpret leaders' technology perception and understand how it differs in the two above categorizations, it has been necessary to find leaders from different company scales to compare global companies with local ones or large companies with small ones in Turkey. After this step, an analysis is provided at the trending products and ideas of current technologies worldwide to compare emerging economies like Turkey with more advanced economies technologically. Large, globalized companies might not give a general opinion about a whole country like Turkey. So, interviews have extended to an industry that covers a broad area to understand leaders' perception countrywide.

This article has two questions. Do business leaders focus on or are they aware of the products and ideas of current technologies? And do they appropriately construe these ideas and products? It has been necessary to understand leadership in global companies that operate in the same country to answer these questions. For this, participation in the Management and Leadership Summit is ensured [3]. People identify digital transformation with social media, and it is studied to analyze basics, trends, economic aspects, and strategy [18]. Webinars and Robot Exhibition followed to test readiness to write and to understand related technologies. The literature review has been to observe trending products of technologically advanced economies. And interviews have been extended to a locally strong industry, which gives clues about a countrywide technology perception. The findings of this research are substantial for leaders so they can have a broader perspective on technology. And for scholars who study leader and technology interplay.

2 Literature Review

In this section, the researcher first probes the literature for finding the answer to research questions. Also, the first part of the review is to reveal the specific views in the literature. These are the views that associate with the work or reflect the body of this work. It is also to set the stage for the article generally. Followingly, the author observes trending ideas and the latest technologies of the digital era. By doing this, he aims to have more knowledge of these technologies. And thus, he can also evaluate if the interviewed leaders are aware of these technological products by comparing interviewees' opinions about technology with these worldwide-cutting-edge technologies. It

would finally help to find the technology perception of an emerging economy like Turkey's with developed countries. The researcher looks at the article as a whole, and for obtaining the most intuitive results, he designs and interlinks literature, interview results, and other components.

2.1 Global perception of technology by leaders

The use of cloud technologies and big data are shaping many industries. The biggest challenge is the transition from internet technology to business technology (BT). Businesses need more leaders who can identify a challenge and pass it on to a technical think tank; leaders that understand how technology works and how it can solve the problem [29]. Similarly, technology is no longer a subcategory of running a business and impacts everything in this process [24]. Furthermore, the adoption of cutting-edge technologies for conducting business activities not only offers competitive advantages. It also provides a means for survival during community lockdown because of the pandemic. Virtual reality technologies for remote operations and the Internet of Things (IoT) are significant for reducing costs of doing business, and big data and predictive and visual analytics enable business decisions [20].

Small and medium enterprises (SMEs) form a significant part of economies because they contribute to revenue and employment. But, as the global economy becomes more dependent on information and communication technologies (ICT), some SMEs have not exploited the benefits that ICTs offer. One of the reasons is that SMEs fail to recognize ICT as technological innovation, hence this affects their adoption of ICT [22]. On the other side, employees' creative information technology usage critically links business technology investment and competitive advantage in the digital era. Yet, to realize anticipated advantages, leaders need to understand better what drives individuals' innovation with organizational technologies [21]. While looking at studies especially designed for leaders' understanding of mobile technologies, they have limited perception concerning these technologies [30]. But a later study has found that the perceived ease and usefulness increase mobile technology usage behavior, and this behavior increases the perceived work performance improvement [26]. Also, a report by Randstad Sourceright claims that 81 percent of employers show excitement for the opportunities that artificial intelligence brings. Yet, workers are skeptical about technology since 44 percent worry about losing their jobs [23]. Leader and follower may exhibit differences regarding technology perception. While the former focuses on gaining a competitive advantage by exploiting technology, the latter seeks ways to keep his/her job.

Why do too many leaders try to avoid technology? They shy away from it since they think it is unknown or overwhelming. So, IT should be dealing with it. But in fact, all leaders must be technology teenagers, and they must be curious and practical to explore and learn technology [27].

According to research conducted by the Information Systems Audit and Control Association, currently and more commonly known as ISACA, only about half of the professionals consider that their leadership is digitally literate [25]. On the other hand, the Global Emerging Technology Trends Survey 2020 – Thematic Research, which is

designed to understand the current approach of business leaders towards emerging technologies and how it will be in the next three years indicates, from the emerging technologies, cybersecurity is an issue for all sectors. And the same conclusion has not come out for other technologies; leaders do not give the same importance to other emerging technologies. So, business leaders need to focus on technologies that reduce costs, assist with the development, and bring process efficiency [28].

2.2   Grasping trending concepts of the digital era

Technology brought many new concepts to people's lives. Leaders are the primary personages who need to adopt the processes and adapt to the behavioral dimensions of these phenomena as the driving force of the societies. Even in the earlier stages of these technological trends, leaders play a role in the propagation process of these thoughts, technologies, and transformation. The technologies can sometimes be easy to comprehend and employ. However, they can be more complex and require exerting more effort in other cases. Some of these spearhead technologies are as follows.

In the United States of America in the early 21st century, the term Cyber-Physical Systems have been introduced. By nature, they are multidisciplinary, and CPSs have multiple socio-technical implications. They depict the integration of objects, and they are embedded systems with information technology and communication. They add new capabilities to the physical systems by the use of computation and communication. Their aspects are properties of systems, governance, and having applicable standards. The creation of such a design necessitates a careful study to realize a certain level of automation. The life cycle of the system refers to the phases from the beginning of its design that has no integration in the management of product or service until the complete integration, including collecting data back from a system [17].

Humans leave digital and physical footprints in everything they do and experience. These footprints make human behaviors more predictable. But eventually, big data is not only about humans, despite people being a significant part of it. These footprints are related to systems, objects, and other living creatures. In addition to this, data, as a very crucial factor of digital transformation, is passing various phases. Along with systems and machines, these phases become criteria in understanding the dimension and scale of digitization: the exponential growth of data processing, communication, and storage. Another debate has risen and is increasing its influence, which is data security.

Big Data's properties are that they have a large quantity (volume), their communication speed is high (velocity), and they have many forms (variety). And the term data may have two following meanings: obtaining information by experiment for solving problems and making decisions or what is stored in computers [9].

The ability of a system to interpret data from the outside world, learn from them, and using these learnings to accomplish specific tasks via flexible adaption is called Artificial Intelligence (AI). It increasingly becomes a part of business life and public conversation owing to the rise of big data and computing power. There are different types of AI. It can be human-inspired or humanized AI, or it can demonstrate analytical skills, all depending on the intelligence exhibited (it can be cognitive, social, or emotional). Classification can also depend on its evolutionary phases (superintelligence, general

intelligence, or artificial narrow). The common theme in all these types: once AI becomes the mainstream, it stops being considered as intelligent, which is called the AI effect [6].

According to Micheal Omotayo Alabi, the process that operates layers upon layers for designing and creating a product by following a three-dimensional model on a digital device is called additive manufacturing (AM). It is referred to as three-dimensional printing also (3D Printing) [7].

Additionally, Boston Consulting Group Analysis reports other trending Technologies than above, which constitute primary components of industry 4.0 are Autonomous Robots, Simulation, Horizontal and Vertical System Integration, Internet of Things, Cybersecurity, The Cloud, and Augmented Reality [5].

In the era of digitalization and technology, the research on technology and leader interaction is scarce, and this matter requires further studies. Yet, in economically and technologically advanced countries, academia, and businesses, a perception of digitalization has occurred.

The three fundamental factors that show digital transformation is not only the extension of the Third Industrial Revolution but also a different period: the impact of systems, speed, and scope [16]. Technology changes both production processes and the ways people live. Following steam, steel, petrochemical, and electricity, digitalization becomes the new revolutionary driving force in business and private life. Long economic waves known as Kondratiev waves relate to these inventions and technologies [19].

The transformation of a business into a digitally capable platform is not only about technology. It is more about long-term plans, new ways of thinking, and strategy [14]. A central challenge in organizations is not only implementing the right technology, but it is also culture and skills; the attitudes and perspectives of an entire organization matter more than its IT [13], [14]. Leaders have not only been affected by this culture but according to Cortellazzo et al., [2] they are significant in the development of digital culture.

Skilled and committed team creation appears as a requirement for leaders in the digital age [1], [4]. Leadership focus on digital business transformation is described as leading cultural change, strategy, leading network, and enabling. Hierarchical leaderships are unsuitable for the new environment, so leaders provide support and empower employees to reach their goals. By doing this, leaders promote dialogue and recognize that employees are experts at what they do, and this challenges the traditional leader role [10].

Digitalization offers new possibilities like virtual teams, introduces new means of communication, increases speed and access to information, impacts power structures, thus, causes efficiency, standardization, and smart working [2].

3   Data and Method

Accomplishing this research and finding results are the outcomes of an algorithmic and well-interlinked design. There are multiple steps, and each step serves to answer a

specific question or learn a dimension of the subject, which plays a role in bringing the whole work into the form of a stand-alone, single piece of work. While answering these questions and learning different dimensions, primary research questions have always been at the center.
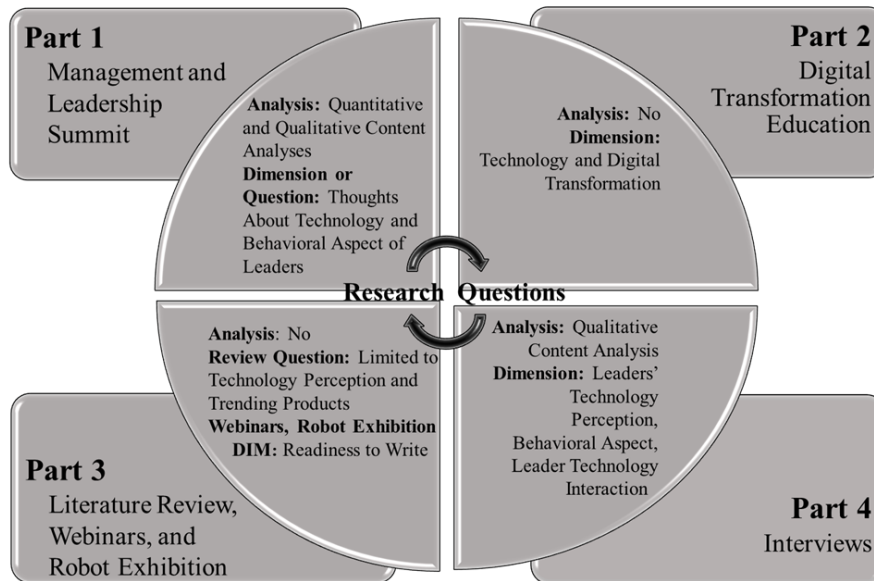

Fig. 1. Design of multi-stage research.

Note: Fig. 1 illustrates the parts that are related to data collection and analysis. It demonstrates the dimension of knowledge that is expected to gain and questions originating from it. The author has produced and prepared the diagram, 2020.

The *Management and Leadership Summit* was held in Turkey with the active participation of the 13 highest-ranking executives in 2020 in Istanbul [3]. The purpose of actively taking part there has been to observe and address questions to the leaders from global and large companies. During the organization, leaders have narratively shared their experiences about leadership and opinions about digital transformation. It has given a chance to collect data regarding the behavioral aspect of their leadership styles and *thoughts of technology*. And later, Summit's results have additionally allowed comparing the outcomes of the large global companies with relatively small local companies (interviews hold in SMEs) in the same geography. Observation time was 15 hours for a group of 13 leaders. Data was collected by taking a considerable amount of notes. The data examination has been via content analysis, and it is a blended method. The qualitative step has been assigning categories to text, and the quantitative step has been calculating the frequencies of these categories [12].

Basics, economic aspect, trends, and strategy of digital transformation has been taken further with the completion of a course [18]. The researcher has followed webinars: *Digitalization's Effect on Work and Human Relations*. And the Next-Generation

Robots Exhibition has been visited. This activity has provided a finding of technology, which is understanding the integration of digital products in machines. *Sources in the whole research belong to the last decade for creating the most updated piece.*

Interviews have expanded to an industry that is widespread and relates to many sectors in Turkey so that it can give concrete ideas countrywide. They also give a chance to make a comparison of the technology perception in an emerging economy with technologically and economically more advanced countries. In this context, the researcher has decided on the intermediate goods industry. On the other hand, since it had to be comparable with large global companies in the same territory, small and medium-sized enterprises have been chosen. The researcher has convinced nine companies to participate in interviews (SMEs have less than 250 employees). Each structured interview with open-ended questions has taken 39 minutes on average. The researcher has documented all the correspondences and interviews. During interviews, the pandemic outbreak has intensified compared with earlier phases of this research. Other stages are to complete in the field usually. Yet digital platforms have been used for realizing the interviews because of the pandemic. This stage gathered around 40 pages of data. And the researcher has conducted qualitative content analysis (QCA) of these data. Content analysis (CA) defines reducing textual data into quantifiable segments after coding. It covers outlining the problem, getting the material, identifying the focus, and counting the occurrences of categories [11]. On the other side, QCA systematically describes the meaning of qualitative material that is done by the classification of material as instances of coding categories [15]. Analyses have run with computer aid. The interviews have given outcomes about leaders' technology perception, their behavioral aspect, and leader technology interplay. And thus, the opportunity to make the above-explained comparisons.

4 The Ultimate Leader of the Future

Examining leaders' perception of digital transformation, state-of-the-art products, and leader and technology interaction brings a typical but not-easy-to-solve matter into consideration in the theoretical part of the research. Who will the ultimate leader be in the future while the divergence of technological, economic, and educational development grows among countries? Especially during the times on which the planet is on the edge of an environmental collapse.

4.1 Technoversal Leader

This leadership is a novel style in the literature. It originates from different phenomena. These phenomena are essential behaviors that a Technoversal Leader possesses (expressed with an acronym APARTS), the leader's being technology adept and having a data-driven mindset, and the necessity of caring for nature while the planet is only a few generations away from being an uninhabitable place. The APARTS are significant for a Technoversal Leader in responding to the challenges of today and the future, such as Volatility, Uncertainty, Complexity, Ambiguity, and more.

Technology causes a challenge, and then technology creates a mechanism to respond to this challenge that is created by itself, and then it brings about another new challenge. In some cases, it becomes a *self-created-problem-solution cycle*. For example, the human mind finds difficulty in handling an exponentially-grown excessive amount of data stored. Yet, the exponential processing power and communication speed of data bring the solution to analyze and interpret this mass. In environmental issues, it is similar: As technology solves many problems, it may also trigger informational and environmental matters at the same time; the reason that human feelings and errors are coming into play as a variable. Another example of a *self-created-problem-solution cycle*, businesses use machinery that pollutes the environment, and other technologically-advanced products clear this pollution [8].

On the other side, this new environment that involves intensive technological advancement creates vicious cycles caused by various disruptions. And these generate weak outcomes since skill gaps can cause externalized organizational goals, which makes them unreachable. APARTS behaviors can fill these gaps and link the organization and leader to its goals. Thus, they can break these vicious cycles.

5 Findings

Findings will be explained in order so that they demonstrate the differences between:

 i. Same geography but different company scales (large global companies versus small-medium local ones),
 ii. Different geographies or cultures.

The *Management and Leadership Summit* allowed observation of leaders' thoughts about technology and digital transformation with their behavioral aspects. The participant leaders in the Summit have been from *large global companies*.

A Chief Information Officer has indicated the relation of human and digitalization factors, "Digitalization is not only to exploit technology but also it is change management of human factor." And "The human mind is resistant to exponential change, and it is open to linear change. Corporations are trying to get used to digital [exponential] change." (Leader GE).

A Chief Executive Officer believes that investment in technology yields returns. And he says, "If leader invests in technology, economy pays back." (Leader CD).

A Sourcing Director emphasizes the significance of digital transformation further, "Corporations that cannot keep pace with technology and digitalization will disappear between three to five years." (Leader SK).

While leaders' thoughts of digital transformation are usually in this specific direction in large global companies at the Summit, the interviewees' opinions about digitalization have been as follows in small-medium local companies. The answers to interview questions have given a general understanding along with specific details.

Leaders' thoughts *concerning digital transformation and digitalization* are interesting since they notice that they are inevitable, yet almost half of the leaders have negative thoughts about them. A sales manager worries, "Maybe, in the next five years, the

growth of digitalization will be faster, this situation scares me sometimes." (Leader MG).

When leaders consider *their role*, digitalization means productivity for them. Yet, a few leaders see digitalization as a means to track employees or as workload. A Mechanical Engineer and IT Responsible explains, "Digitalization means the increase of my workload, everything asked to me, and I am to be held responsible for all the solutions." (Leader HE).

When they have expressed *feelings about the meaning of digitalization for communications in private life and job*, the majority of interviewees have complained about it, or they have indicated that there is no distinction between them. A Research and Development Manager divides the answer to this question into private life and job effects, "Private life, the rapid advancement of social media and digital channels cause violation of private life and customs and traditions to suffer. These are very important, must be controlled. Business life, it means to speed, effectiveness, and rapid access to data.'' (Leader SA).

Leaders, in their companies generally, either *recognize further digitalization* that is not broad in scope, or they do not recognize any further digitalization at all. A Sales Director says, "I do not have any ideas to make any applications. We neither have an application nor a software." (Leader ŞG).

In times of the digital age, *learning and performance* play a vital role in ensuring leadership continuity and raising leaders. In addressing and answering more leadership needs plus these particular ones, specific skills and behaviors become prominent. They are as follows: agility, problem-solving efficiency, adaptation, respect, technology, seeking different perspectives. The acronym APARTS expresses them [8].

6   Discussions

Analyzing leaders' thoughts, examples of which are above, the digital culture in large global companies in Turkey is obviously in the same specific direction as the businesses that are in developed economies. They grow awareness for digital transformation for the economic sustainability of their businesses. One can interpret this as they are the extensions of those businesses that are based abroad, or the educational and cultural background of human resources in large global companies is more adaptive to digital changes.

The above review mentions some trending and cutting-edge technologies. Yet, during the interviews in nine small-medium local companies, the leaders have not spoken about the current or probable future use of those products. Although both large global and small-medium local company observation groups are in Turkey, a critical difference has interestingly occurred and was observed between small-medium local with large global ones. It is because of the fact there are *limited* knowledge and use of advanced technologies and digital products by many leaders in small-medium local companies. *Or when somebody mentions digitalization or even technology, social media is the dominant factor in their minds that they identify it with technology and digital*

transformation. Acceptably, social media is part of digitalization, yet its identification with digital transformation is excessive in this observation group.

The answer to the interview question concerning *leaders' standpoint of digital transformation for their industry and company* gives us a significant finding at this point. A group of interviewees thinks that digital makes the business practical and productive. So they intend to strive to become digital. But, there is also another group that has limited use, that is new to it, or that even thinks digital transformation is not necessary. A CEO says, "Digitalization is very new in our country. Companies have problems regarding the integration of digital transformation. Understanding digital transformation, reaching specific technologies, and interiorizing it, will take at least ten years from us." (Leader GA).

7 Conclusions

As of 2021, some of the particular trending technology products and concepts are Cyber-Physical Systems, Big Data, Artificial Intelligence, Additive Manufacturing, Autonomous Robots, the Internet of Things, Cybersecurity, The Cloud, and Augmented Reality.

Business leaders perceive digital transformation differently in different cultures and geographies. Because of unequal advancement and cultural diversity, a specific welfare level or geography sees digital transformation that is radically disparate from others.

Besides business leaders' perception of digitalization in different geographies, they may also perceive it differently in the same country but different company scales.

In the observation groups, leaders in large global companies in an emerging economy like Turkey's have well recognized that they have to *become immune to digital transformation*. And without becoming so, they think that it is impossible to sustain economically in the competitive environment of this new world order.

In the observation groups, leaders in small-medium local companies have intuitively felt the transformation caused by disruptive technology. Yet, it is too early to mention that they have a *digital consciousness*. Neither are they fully aware of products and concepts, nor do they have a strategy to become digital.

In the observation groups, large global companies strive more to *digitalize their business*. And the reason for that is: they are the extensions of those businesses that are based abroad in economically and technologically more advanced countries, or the educational and cultural background of human resources in these companies is more adaptive to digital changes.

In the observation groups, small-medium local companies, there are fewer efforts to run businesses digitally. The reasons for this fact are limited knowledge, reach, and limited use of advanced technologies and digital products by many leaders in them. *Or when somebody mentions digitalization or even technology, social media is the dominant factor in their minds that they identify it with technology and digital transformation*. Acceptably, social media is part of digitalization, yet its identification with digital transformation is excessive in this observation group.

This research openly and significantly demonstrates that leaders, especially in small-medium companies, should focus more on technology products than social media for having a better perception of digitalization and technology.

In addition to bringing an environmental conscience to leaders, Technoversal Leader and APARTS behaviors also relate to leader technology interaction and leaders' behavioral aspect in the digital era.

APARTS behaviors and skills will be essential to maximize the effectiveness and efficiency of leadership. They are critical factors that directly affect leaders' performance.

Some precise notes are going to be useful for a better understanding. Leaders in the interviews have only mentioned a couple of relatively old technologies, and they have rarely mentioned the advanced and trending elements of industry 4.0 and digital transformation. They have not even implied their willingness to pursue it except for a few rare occasions. In light of this, it is fair to say there is a general lack of knowledge concerning this specific subject, and there has been a narrow perspective regarding digitalization and technology in the intermediate goods industry. But one could understand that all interviewees have perceived the change around them caused by disruptive technology, so this can be added many leaders feel it, understand the necessity of taking action, and yet very few take action in this industry. Basic trending concepts of the technology are listed in earlier stages of this research, and there are also other concepts. But, particularly in this industry, digital transformation has been dominantly identified with social media and a couple of relatively easy technologies. And it is interesting even though leaders look from the framework of *a couple of older technologies and social media scope, they have still noticed well that digital transformation has a profound effect on them and their leadership styles.* Despite their standpoint, interviewees have also understood that leaders who do not accept technology will fail to succeed. It is also useful to understand *the intermediate goods industry is very strong in Turkey, yet it is still too early to mention digital consciousness in this industry.*

8   Acknowledgement

9   References

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10   Author

Hakan Kapucu has approximately 20 years of work experience as of 2021. The first seven years of the last eleven years were spent in International Commerce, and the following four were spent in Investment. The author is a firm believer in science and

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