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EXPLORING THE BARRIERS TO DIGITAL TRANSFORMATION FOR COMPANIES IN TURKEY

Abstract

Digital transformation of companies is not only the use of new digital technologies and the digitalization of business processes, it includes also the creation of new digital business models and the establishment of a digital corporate culture and organization. Because of this high level of complexity, the transformation process does not always go smoothly for companies. This study aims to determine what limits Turkish companies in their digital transformation journey and to identify some key barriers in the hope of guiding Turkish companies for a better experience in digital transformation projects. General barriers to digital transformation were determined from literature analysis and then verified and expanded with the expert interview method. Seven experts from a Turkish technology consulting company were interviewed and as a result, the main barrier to digital transformation was identified as “lack of financial resources” followed by the barriers “lack of time”, “lack of a clear vision/strategy” and “missing process knowledge”.

Keywords: Digital Transformation, Barriers, Challenges, Expert Interview

TÜRKİYE'DEKİ ŞİRKETLER İÇİN DİJİTAL DÖNÜŞÜM ÖNÜNDEKİ ENGELLERİN ARAŞTIRILMASI

Öz

Şirketlerin dijital dönüşümü yeni dijital teknolojilerin kullanılması ve iş süreçlerinin dijitalleştirilmesinden daha fazlası olup, yeni dijital iş modellerinin oluşturulmasını ve dijital bir kurumsal kültür ve organizasyonun oluşturulmasını içermektedir. Bu yüksek düzeydeki karmaşıklık nedeniyle dönüşüm süreci şirketler için her zaman sorunsuz ilerlememektedir. Bu çalışma, Türk şirketlerini dijital dönüşüm yolculuklarında nelerin sınırlandığını belirlemeyi ve Türk şirketlerine dijital dönüşüm projelerinde daha iyi bir deneyim için rehberlik etme umudu ile bazı temel engelleri belirlemeyi amaçlamaktadır. Dijital dönüşümün önündeki genel engeller literatür analizinden belirlenmiş ardından uzman görüşme yöntemi ile sorgulanarak doğrulanmış ve genişletilmiştir. Türkiye’de aktif çalışan bir teknoloji danışmanlık şirketinden yedi uzmanla görüşülmüş ve sonuç olarak dijital dönüşüm önündeki ana engel “finansal kaynak eksikliği” olarak ortaya çıkmıştır. Bunu takip eden engeller ise şu şekilde belirlenmiştir: “zaman eksikliği”, “net vizyon/strateji eksikliği” ve “eksik süreç bilgisi”.

Anahtar kelimeler: Dijital Dönüşüm, Engeller, Zorluklar, Usta Görüşmeleri

INTRODUCTION

The concept of digital transformation has been born out of Industry 4.0 as the latest turning point of industrial revolution. Digital transformation means more than digitization of company data and digitalization of business processes, furthermore it includes digitalization of business models, creating digital products and services that create new value for customers, adapting of organizational structures and company culture to digital circumstances by using digital technologies of any type (Berghaus and Back, 2016; Burmeister et al., 2016; Henriette et al., 2015; Hess et al., 2016; Matt et al., 2019; Klein, 2020). In fact, adaptable companies see the industrial revolutions as an opportunity to be more flexible. Conservative companies that do not accept these developments gradually fail. Ultimately, all industrial revolutions have had similar events: innovation, acceptance, and success, or rejection and failure. This is the same twist that companies find themselves in with the fourth industrial revolution and digital transformation (Rogers, 2016). Businesses that want to gain a competitive advantage in the market or maintain their current status must successfully perform digital transformation and keep up with the digital age (Klein, 2020).

With the COVID-19 pandemic, companies began to really understand the importance of being prepared for digital transformation (Almeida et al., 2020; Kutnjak, 2021). Digital transformation projects aren't just technology projects, they include having the necessary skills to structure the company accordingly, such as leadership and having a clear vision for digital culture (Cichosz, Wallenburg and Knemeyer, 2020; Jones, Hutcheson and Camba, 2021). Success of digital transformation is not only important for operational activities of the enterprises, it increases also achieving their strategic goals. If companies can transform themselves successfully, they become more sustainable, and efficient and it becomes much easier to run especially the day-to-day business. It can therefore be said that in the coming years the change-resistant companies will cease to exist due to increasing digitally competent

competition. Therefore it is important to be aware, which the barriers to digital transformation are, in order to develop strategies to an effective digital transformation.

The pace of digitization in daily life triggers governments and the private sector because demand is developing in this direction. Digital habits of the individuals of a country is a very important indicator about the success of digital transformation in companies (Karabacak and Sezgin, 2019). In case of Turkey, the use of digital technologies in daily life is rapidly increasing despite economical weakness especially because of the proportional excess of young population. In other words, the required demand to digital transformation of companies in Turkey has actually been created. But numerous researches show that a limited way has been taken in Turkey on the way to the digital transformation evoked by the fourth industrial revolution, and Turkey's position in the world lags behind what is desired: In the study “*Turkey’s Digitalization Index*” conducted by Accenture, Vodafone, Boğaziçi University, METU and Turkish Informatics Foundation on large companies to identify strengths and weaknesses in different dimensions of digitalization, it is observed that the digitalization average of companies in Turkey has an average of 61 points out of 100 points (Accenture, 2016). This result shows that there is still a long way to go in the field of digital transformation in Turkey. According to the “*Turkey's Digital Transformation Index 2021 Report*”, Turkey's digital transformation index was measured as 3.24 out of 5 and maintained its upward trend in the last two years (Tubisad, 2021). According to Tubisad (2021) the grades of all three digital transformation sub-dimensions “Individual”, “Business World” and “Public” with 3.31, 3.41 and 3.37 are close to each other. In the report titled “*Turkey's Digital Transformation Competence in Industry*”, prepared by TÜSİAD together with Boston Consulting Group and published in December 2017, it is stated that Turkey is still at the beginning of the digital transformation journey in the industry and that companies in Turkey are still in the stage of realizing (44/100) pilot projects in digital transformation application areas (TÜSİAD, 2017). In the report “*New Industrial Revolution Intelligent Production Systems Technology Roadmap*” published by Tübitak in January 2017, the digital maturity level of the industry in Turkey is stated to be between Industry 2.0 and Industry 3.0 as a result of a survey conducted with 1000 companies (Tübitak, 2016).

Digital transformation is a disruptive process for companies as it causes fundamental changes in all structures and therefore it is associated with numerous barriers that may prevent its success (Cichosz et al., 2020). In addition to technological barriers to DT organizational barriers are also common. The biggest obstacles to digital transformation seem to be the lack of qualified human resources and the absence of a transformation policy. According to McKinsey's report (2016), the difficulties encountered in implementing industry 4.0 in general are as follows: coordination difficulties among organizational units, concerns about cyber security in case of working with a third party / supplier, lack of courage for radical change and lack of qualified workforce. Similar to that report according to the study “*CEO Perspective on Digital Transformation in Turkey*” of Tüsiad (2016), the main barriers to the development of digital technologies in companies in Turkey are lack of competence (14%), lack of strategy (13%), security problems (13%) and inability to reach a strong commercial result (12%). As for the challenges ahead of the fourth industrial revolution, the Accenture report states management-organization issues such as agility and decision-making processes, regulations, company culture, financial resource allocation and skilled workforce (Accenture, 2016).

Analyzing the barriers to digital transformation would help companies in Turkey to be better prepared for digital transformation. This study aims to determine barriers to digital transformation in Turkish companies in order to support them in their digital transformation journey conceptually. The results should support companies in Turkey by realizing their digital transformation plans. The method of the study is in-depth expert interviews. General barriers to digital transformation which are the basis of the interviews are gained from literature analysis and then verified with the expert interview method. Then in-depth expert interviews are conducted with white-collar employees working in a digital transformation consulting firm to understand which barriers affect the digital transformation of businesses. Questions used in interviews are based on the barriers found in the literature review. The expertise of the chosen experts lies mainly in the SAP program and Industry 4.0. Data collected from these interviews are categorized and analyzed by the method of qualitative data analysis. The aim is to investigate if the barriers found in literature research are applicable to Turkish companies or not and to identify additional Turkey-specific barriers to DT.

PREVIOUS RESEARCH – BARRIERS TO DIGITAL TRANSFORMATION

Nowadays success of digital transformation is crucial for companies. For this reason the barriers to digital transformation should be well defined, in order to take the necessary measures to avoid them. As a result of literature analysis, it has been observed that there are many studies that do research on barriers to digital transformation. Studies about barriers to implementing Industry 4.0 or to innovation in companies can be also applied for digital transformation as digital transformation is evoked through Industry 4.0 respectively is a sort of innovation in a broad sense. While some studies only summarize the results of literature analysis about barriers to digital transformation, other studies use the results of literature analysis to come up with their own categories of digital transformation barriers by deploying quantitative or qualitative methods: The study of Jones et al. (2021) analyzes many works on digital transformation and points out the most outstanding barriers to digital transformation of six major articles analyzed with the statement that most of the barriers are technological. In another study the barriers to digital transformation are identified on the basis of interviews with forty-six experts from various industries, where the barriers are grouped into missing skills, technical barriers, individual barriers, organizational and environmental barriers related to a sociotechnical approach (Vogelsang, Liere-Netheler and Pachmohr, 2019). Another framework of barriers to digital transformation consisting of financial, knowledge & skills, regulatory, technological, environmental, organizational and cultural barriers has been developed based on a comprehensive literature review (Lammers, Tomidei and Trianni, 2019). Kutnjak (2021) shows the frequencies of following barriers to digital transformation: difficulties in misunderstanding and mistrust in digital transformation, lack of standards, lack of a coordinated digital strategy. In the study of Raj, et al. (2020) first the barriers to implementing Industry 4.0 are identified from literature review and from discussions with industry experts in the context of developed and developing economies, second the causal relationships between 15 barriers are analyzed. The barrier “lack of a digital strategy” came out as the most important barrier in both developed and developing economies. The barrier “lack of standards, regulations, and forms of certification” has been identified as the most important one in developing economies, while the barrier “low maturity level of the desired technology” for developed economies. Cichosz et al., 2020 identified five major barriers to digital transformation based on a literature review followed by

case studies: Complexity of underlying processes, lack of skills, difficulties in technology adoption, resistance to change and doubt on data protection.

There are two important contributions in literature about Turkey specific barriers to digital transformation: One of them is the study of Demirbas, Hussain and Matlay (2011) aiming to examine the barriers to innovation in small and medium-sized enterprises in Turkey. As result of that study based on an empirical investigation of 224 SMEs operating in Turkey it comes out that lack of government research and development policy is the most important barrier to innovation in Turkey. The other study aims to analyze the interrelations of potential barriers to Industry 4.0 in Turkey which are gathered from the literature with ISM method supported by surveys with 14 specialists. The finding of that study is that “lack of vision” is the barrier affecting all other barriers (Saatçioğlu, Özispa and K k, 2019).

The literature analysis show that technology and people are both the biggest barrier group in previous studies and results of studies on barrier to digital transformation are overlapping. The barrier framework proposed in the study of Vogelsang et al. (2019) is chosen as the basis for interviews in this work as it covers all mentioned barriers to digital transformation (Table 1). These specific barriers will be used as a basis in the methodological phase to find out which ones are most important for Turkish companies.

Category of Barriers	Barriers
Missing Skills	IT knowledge Information about and decisions on technologies Process knowledge
Technical Barriers	Dependency on other technologies Security (data exchange) Current infrastructure
Individual Barriers	Fear of data loss control Fear of transparency/acceptance Fear of job loss
Organizational and Cultural Barriers	Keeping traditional roles/principles No clear vision/strategy Resistance to cultural change/mistake culture Risk aversion Lack of financial resources Lack of time
Environmental Barriers	Lack of standards Lack of laws

Table 1: The biggest barriers to digital transformation. Source: (Vogelsang et al., 2019)

Missing Skills

IT knowledge are needed not only in IT departments anymore, they are essential throughout the organization. Most companies do not understand the value of the necessary skills for transformation. According to a recent survey, 51 percent of respondents said the biggest barrier to workforce transformation is the inability to identify the digital skills needed (Engler, 2020). According to Hargrave (2019) instead of being overly dependent on a 'buy' strategy, organizations should give greater focus to a 'build' strategy, providing staff with the training that will enable them to develop a sustainable digital skill set and address digital innovation in the business. Companies need personnel who are informed about digital technologies so far that they can make decision on usage of technologies in their operations. Moreover another skill which is becoming relevant is process knowledge of employees, because without knowledge about the business processes it is not possible to transform the processes (Vogelsang et al., 2019)

Technical Barriers

One of the main reasons companies struggle during the digital transformation process is technical barriers. The need for using many different technologies make the digital transformatin complex. The dependency between different technologies represent a barrier to digital transformation. Another important point is the data security in an environment full of data exchange. Security concerns about highly valuable company data stands in the way of digital transformation (Vogelsang et al., 2019). The current infrastructure of the company is another technical barrier to digital transformation, since they are too old to convert (Vogelsang et al.,2019).

Individual Barriers

Digital transformation should come with a collective effort and strategy. The same vision should be shared with management and employees. Skepticism or a lack of acceptance of employees complicates the transformation. Since personal data becomes more available through digitlization, data of employess can be compared with each other. This transparency could lead to increased monitoring of efforts. Employees fears of data loss or of too much transparancy are individual barriers to digital transformation (Vogelsang et al., 2019). The fear of job losses due to technological developments is also a major barrier to digitalization in general.

Organizational and Cultural Barriers

Retaining tried and tested old methods and technologies, traditional roles and principles hamper digital transformation. It is becoming increasingly clear that digital transformation is not just about technology, but workplace culture and resistance to cultural change and risk aversion are important organisational barriers to digital transformation (Cichosz et al., 2020; Grenier, 2019). The lack of a clear vision or strategy is also a very big obstacle for businesses to overcome (Raj, 2020). Some companies decide to start digital transformation but do not know exactly how to go about it, what needs to be done, what their short- and long-term plans are, etc. Companies that do not set clear goals are very likely to fail. One of major organizational barrier is represented by financial factors: High costs of digital transformation need to be financed. Lack of financial resources make it difficult to carry out digital transformation projects (Lammers et al.,2019). Since digital transformation is a complex project, it will take time. Employees should work on

their operational duties and at the same time for digital transformation which is stressful. Lack of time is also a barrier to digital transformation (Vogelsang et al., 2019).

Environmental Barriers

The last barriers identified in the framework are environmental. Standards or norms for digital transformation help companies in the implementation of digital transformation projects (Lammers et al.,2019). According regulations and laws support also the digitalization in companies (Raj, 2020; Vogelsang et al., 2019). Lack of standards and laws hinder the efficiency of digital transformation projects.

STUDY

Aim

The aim of this study is to find out Turkey specific barriers of companies to digital transformation. The barriers found in the literature review build the basis for the research question. For this study, qualitative research was selected as the most suitable type of research. Qualitative data can be viewed as deep and meaningful explanations of specific issues. The expert interview was chosen as the method of this qualitative research. The type of expert interview used in this work is the semi-structured interview (Schmidt, 2000).

Data Collection

Based on the literature review, an interview guideline (Table 2) has been developed that helped to structure the conversations with the experts. The interview has been organized into eight questions. Some questions are candid and some are open-ended conversations. Before the interviews, information was given to clarify the purpose of the interviews and what the gathered data will be used for later on. During the interviews, the experts were motivated to share information on the research questions and were generally helpful. First, the age of the respondents and their experience in the consulting industry for the digital transformation as well as their professional experience in general were asked to present their expertise in this study. In addition, one of the key questions was how many digital transformation projects they have worked on to date as a consultant or team leader. This also helped to understand how well versed they are in digital transformation and how often they observed the behavior of Turkish companies during projects. The last three questions were about the research question “What are the barriers to digital transformation in Turkish companies?”. If necessary, the order of the barriers has been changed during the interviews according to the course of the conversation. In total, 7 face-to-face interviews were conducted between April 21 and 29, 2022. The interviews lasted between 20 and 70 minutes and they were recorded for later analysis.

1. Question	How old are you?
2. Question	What is your work experience?
3. Question	What are your job title and description?
4. Question	How many digital transformation projects have you worked on?

5. Question	Which industries do these companies (projects) belong to in general?
6. Question	Which of the barriers mentioned in Table 1 do companies encounter in the digital transformation process? Can you explain in detail and give examples?
7. Question	Do you want to add barriers that you may have encountered?
8. Question	What should companies do to avoid the barriers they have seen or limit the damage to the digital transformation process?

Table 2: Interview Guideline. Source: Own illustration

Sampling

The interviewees were selected carefully and it was of paramount importance that they had the experience with digital transformation in Turkey, and have carried out projects for companies as consultants or project managers, to be able to share their experiences as real experts and be able to provide relevant answers to research questions. All respondents work in the same consulting firm but have different roles, and professional and project experiences. In the further course of this study, this company will be referred to as company X. Company X has approximately 1500 employees serving companies both in Turkey and worldwide with 30 local teams and 7 global teams is one of the largest IT consulting firms in Turkey. The consulting area cover a diverse portfolio of services such as Amazon Web Services, Microsoft Azure, Google Cloud and SAP, which is the main competency of Company X. The most relevant consulting service for this study is “digital transformation consulting”. Company X shows customers the benefits of digital transformation by focusing their innovation efforts on improving customers' business models in the best possible way, and therefore developing a clear strategy. Information on the seven respondents can be found in the following table.

	Age	Job Title and Experience	Project Experience	Sectors of Consulted Companies
Interviewee A	31	Migration & Conversion Manager 11 years	5 projects	Household appliances, Construction, Automotive, Cosmetics
Interviewee B	33	Head of Digital Transformation 11 years	10-15 projects	Retail, Automotive, Service
Interviewee C	37	Migration & Conversion, Senior CO Consultant 16 years	25-26 projects	Furniture, Pharmaceutical, Food, Automotive, Iron and steel, Construction
Interviewee D	35	Head of Service Delivery 11 years	over 100 projects	Textile, Automotive, Iron and steel, Pharmaceutical
Interviewee E	23	Migration & Conversion, Senior FI Consultant 3,5 years	4 projects	Household appliances, Construction, Food
Interviewee F	34	Head of Smart Factory	over 20 projects	Automotive, Iron and steel, Textile,

		15 years		Pharmaceutical, Food
Interviewee G	26	Migration & Conversion, Senior SD Consultant 3 years	7-8 projects	Textile, Furniture, Cable industry, Construction, Household appliances, Food

Table 3: Information about respondents. Source: Own illustration

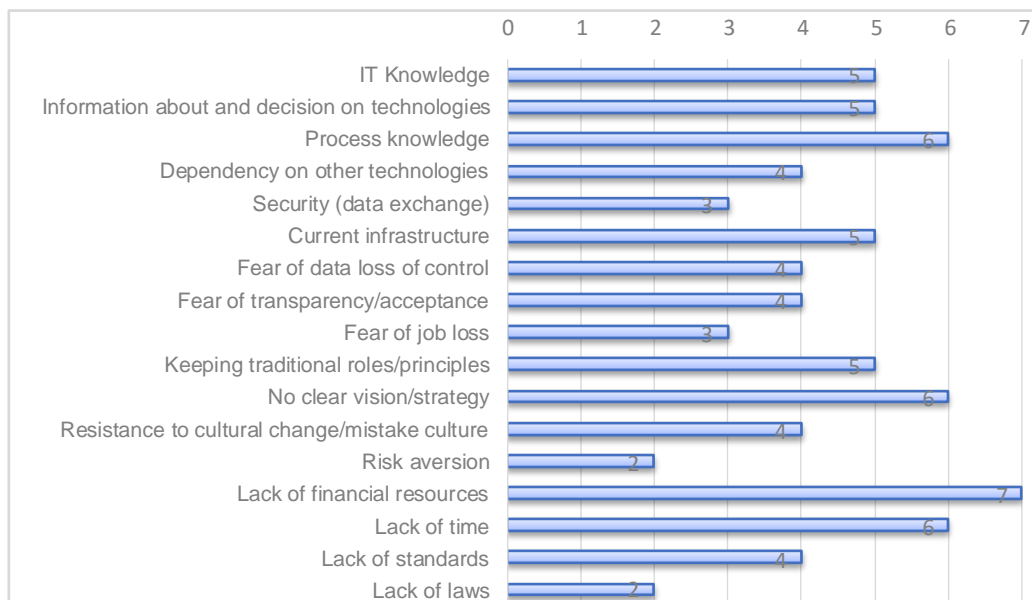
Data Analysis

The collected data through the expert interviews were interpreted and analyzed with the approach of qualitative content analysis. The responses are grouped according to the barrier categories in Table 1: Missing skills, technical barriers, individual barriers, organizational and cultural barriers, and environmental barriers. Then, data were sorted according to similar themes like additional barriers and advices.

Results and Findings

Conducted interviews lead to several results according barriers to digital transformation in Turkish companies. The first finding is that for Turkish companies, all barriers are relevant to some extent, whether they are technical, individual, organizational or environmental barriers. The most common barrier is identified as “lack of financial resources” followed by “lack of time”, “no clear vision/strategy” and “missing process knowledge” (Figure 1). The most uncommon barriers are “lack of laws” and “risk aversion”. The following graphic shows which barriers apply in Turkey according to experts:

Figure 1: Barriers in Turkey according to experts. Source: Own illustration



The detailed explanations about asked barriers are summarized for each barrier category as follows:

Missing Skills

One of the most common problems that the consultants encounter is uninformed clients (firms) in IT. In one of the interviews this has been defined as a more common barrier in medium to small companies, as big companies have more resources. They do no research products according to their needs, therefore they are uninformed about technologies surrounding digital transformation. In fact, one interviewee said that they are actually surprised when they do not encounter this problem. One of the consultants speculated that this is because companies think transformation is a complete do-over instead of just an improvement, resulting in less interest to learn about digital transformation. One of the interesting arguments in the interviews was that the customers in fact need IT knowledge especially after the project is over. He elaborated that these customers were reluctant to transform because they thought this would lead to extra costs.

This barrier can also be extended to pre-sales meetings, in which customers do not know much about transformation processes. One expert said that workers are generally in the projects because it is an obligation, so they are not particularly interested to learn more. But this can be overcome with a little effort according to another expert. In addition, one expert observed a pattern with Turkish companies regarding their stubbornness to stick to their old processes. Explaining the new processes leads to wasting time and extra workload. One interviewee explained that informing the companies is actually a crucial part of a healthy digital transformation journey, because making uninformed decisions can cause fatal results for them. One expert also revealed that her team usually follows a roadmap and it is shared with companies beforehand, but even then they generally do not care and forget about the essential steps.

Talented IT employees are needed in every phase of projects. Sometimes this need can be met within the consultant firm, however most interviewees pointed out the fact that these kind of employees are lacking in some Turkish companies, causing a huge problem for digital transformation projects in Turkey. In one of the interviews it was explained that sometimes they have to give consultation on even the simplest IT problems because companies are lacking in this area. Interestingly, one interviewee stated that even some of the “talented” employees can cause delays because of his/her poor communication skills, indicating that soft skills are just as important as technical skills. Although one interviewee contradicted his co-workers by saying projects can be carried out without skilled IT employees, mentioning that consultants can help with many of the problems anyway.

Technical Barriers

In some interviews it was explained that there were cases in which experienced workers who have worked with a particular software too long resist working with SAP and fear change in technologies in general. In addition, the dependency on other technologies cause transformation projects to be limited in efficiency. Nevertheless, one expert thinks that if a company contacts consulting companies to carry out a digital transformation project, it means that they are not dependent on their own technologies. Some of these workers also think that transformation is useless, but thankfully these people are not decision-makers and do not affect the transformation process much. Another expert also interpreted dependence on other technologies as dependence on manual work and explained that this creates resistance against transformation.

As cloud products get more popular, so does the discussion revolving around their security. This is one of the key discussion points in project meetings according to interviewees. One of them added that some of the companies are uncomfortable from the fact that their data is stored in centers abroad, as SAP does not have one in Turkey. One expert explained that security is an important barrier in Industry 4.0 projects. She specified this by saying firms in the defense industry may be reluctant to do transformation projects because they are concerned specifically with the ability to give commands to the machines through the internet. Some interviewees approached the security issue in a different angle by saying security measures in projects are usually provided from the SAP software they use and from the confidentiality agreements in contracts, so it is not really a barrier.

Certain criteria in infrastructure quality must be met in order to successfully implement digital transformation. Some companies did not live up to these prerequisites according to one interviewee. In an interview this was elaborated by an expert that said almost %70 of the companies that she has worked with are not ready with their infrastructure in terms of IoT, Automation or Sensors. In ERP projects companies often do not provide necessary databases for projects because of the costs. One of the big problems with the popular cloud products is they are not available on-site, so some companies do not want to invest in such products. Consequently, one of the consultants said that this is not a barrier but simply a preference issue (on-site or cloud).

Individual Barriers

According to most interviewees, it is possible that data may be lost during the transformation process. Financial data is especially important and carries the biggest risk. Like most barriers, this comes down to costs again. Experts agreed that companies need to build bigger data centers and make investments if they want to prevent data loss and store past information. One of the experts even observed data loss caused by hacker attacks. Because this is a common barrier, it is consultants' responsibility to prove to the customer that there is no lost data after the transformation. Therefore, they have many plans and methods in case of a data loss. In regards to Industry 4.0 projects, it is even harder to lose data because data processes have been automated from machines to software, so that there is no room for manipulation.

Companies not being transparent can be a big problem during long term projects according to one expert. Small companies especially can try to hide their financial data with the intention of manipulating the data to avoid audits. Interestingly, another expert added that it is the consultants' fault if companies are not being transparent. Also, it is hard to hide information during ERP projects because the software shows almost everything anyway. Nonetheless, some companies want to draw a clear line between their business and the consultants by using authorization methods. Considering the complexity of a digital transformation process, companies can also forget to share some of their data unknowingly.

Some experts agreed that employees worry of job loss as a result of digital transformation. In many instances it was witnessed that if a project is successfully done, then it is very likely that workers/managers most responsible get a promotion, but if it is a failure, then they often lose their job. This creates a tense environment and a barrier. Prejudices against digital transformation and SAP were also observed as a result of the belief that machines will take their place in the company. One expert did not agree with this barrier by explaining that this is hard to understand from their point of view. Another interviewee shared her experience by saying

that she came across an experienced employee losing his job during a digital transformation project because he was stubborn about using his own ERP software. One expert ultimately stated that workers should not worry about losing their jobs, because it is the consultants' goal to make workers' jobs easier, not to dissolve their jobs in its entirety.

Organizational and Cultural Barriers

Desire to keep traditional roles and principles is a common barrier amongst Turkish companies. People usually tend to resist change even if it would be better for them in the long term, although one expert stated that financial employees are aware of these benefits and generally accept transformation. There was an instance according to one interviewee that an IT manager with 30 years of experience wanted to use his own legacy software and did not want to leave his comfort zone. This kind of behavior was confirmed also by other interviewees. One expert speculated that this desire is also due to age. She explained by saying because the younger generation is more adaptable to new roles and can be more effective, and they do not want their position's importance to take any damage.

Many of the interviewees agreed that not having a clear vision or strategy is one of the biggest barriers companies face in Turkey. But even if they want to start this journey, they are usually incapable of transforming wholly due to financial reasons and only select certain modules that they think would be the most beneficial.

There are many family businesses in Turkey, and they are usually run by managers that have founded and led their companies for a long time. Therefore, they are not open to try new things and change their long standing culture. Even in non-family businesses, culture change is hard because of how important tradition is to them. A digitally transformed company requires only a minimal amount of human communication, and that is one of the deal breakers for traditional companies. One expert added that digital transformation is usually not accepted nor understood on the lower end of the hierarchy therefore they are not really enthusiastic for change. This change is also feared for reasons such as job loss as explained earlier. He elaborated by saying that this journey has to start with an eagerness and interest for digital transformation but that usually comes from the management in Turkey.

Risk aversion is not usually on Turkish firms' thought process before or during digital transformation. One consultant said that they take every necessary precaution, including reducing possible risks that could be caused by suddenly changing a system that ten thousand workers use. Instead they make the transformation in parts, therefore making it easier for companies to get used to the system. Another expert added that companies are even willing to take more risks if it means a cost reduction.

Due to the economic crisis in Turkey, lack of financial tools is an obvious obstacle to doing business in Turkey and a serious barrier against digital transformation. Even the companies that are interested in digital transformation and its technologies usually have to reconsider because of financial difficulties, high short-term costs and budget cuts. One expert observed manual labor implemented in a fairly large company instead of trying to automatize the work just because of costs, but this kind of attitude is more common amongst smaller companies. But there are instances where a project has already started and it is actually less damaging to finish the project instead of terminating it, because of obligations to meet certain deadlines. Even if a

big and capable company decides to transform digitally, this particular barrier may be the one that makes them give up.

Almost all of the experts agreed that lack of time is making things difficult during the digital transformation journey. For example, projects that would normally take 2 years abroad have a 6 months-1 year deadline here because of costs, and that damages the quality of projects. These projects are usually unfinished and have untested functions. Companies are also worried as to when they are going to see the benefits of transformation. One of the things that is often overlooked in pre-sales talks is the fact that the project has to be carried out alongside the firm's day-to-day business, so there may be extra recruitment or training required.

Environmental Barriers

Lack of standards have been interpreted in different ways by experts. One expert described it as the absence of qualified employees, in which case it is a common situation. Another expert said that this can be seen for instance as lack of financial regulations. However in sectors where there are production procedures involved, there should be distinct standards. These standards are hard to implement into a system for some companies because of their elastic production and shipment structure. These companies usually grew aggressively in a short amount of time (which are common in Turkey), so there was no time to standardize production. For that reason, even if a particular product is produced in the same type of machines in different factories, it is usually up to the workers that operate them to establish what kind of standard that product holds.

“Law” is a somewhat open term and interpreted differently again. An interviewee stated regulations are somewhat lacking and insufficient to support companies. It was described from a localization perspective by another expert. When new products first enter the Turkish market, sometimes they are not compatible. There were cases where the consultants had to contact SAP Turkey personally to implement localization.

Additional Barriers

Additional barriers to digital transformation mentioned by expert interviews are as follows:

- Uncompatible digital transformation scenarios: The compatibility of digital transformation scenarios with operational business scenarios is very important. Uncompatible scenarios could block the progress of digital transformation.
- Communication problems between management and employees regarding digital transformation: Many respondents identified an issue that even when management has a great vision for the company and is willing/able to avoid barriers, the purpose and importance of digital transformation cannot be expressed to the rest of the company. This harms transformation projects.
- Unrealistic schedules: Businesses are very concerned about the cost of digital transformation. Because of this, they pressure consultants to complete projects at unrealistic time frames. For example, in Europe, a project is expected to be completed in 2 years and in Turkey, it is expected to be completed in 6 months. This leads to unsuccessful or incomplete projects.
- Unwillingness to leave the comfort zone: Employees are often used to a certain way of working. Usually, this way is outdated, labor-intensive and ineffective. Unfortunately, it

is really hard to convince people to leave their comfort zone and get used to a new work system.

CONCLUSION

As digital transformation becomes more popular, understanding the barriers that stand between transformation and businesses also becomes more important. If companies know exactly what the challenges are, they can draw a clear path for their companies and create a long-term vision in the hope of digital transformation. The literature analysis show that there are several studies about barriers to digital transformation and also barriers to Industry 4.0 and to innovation in companies, which are also applicable for digital transformation. The barriers of these literature sources are overlapping so that one barrier framework is chosen as basis for interviews. During the interviews of seven experts from a reputable consulting firm in Turkey, the barriers from the chosen framework are questioned and key suggestions were collected from experts. Every interviewee contributed in some way and shared their experiences on how the companies can be more successful in digital transformation. This study identified as the most commonly seen barrier to digital transformation in Turkey “lack of financial resources”. Furthermore “lack of time”, “no clear vision/strategy” and “missing process knowledge” are also important barriers for Turkish companies. The findings of this study is also consistent with another research on barriers to digital transformation in Turkey. The finding of the study Saatçioğlu et. al. (2019) that “lack of vision” is the most effective barrier corresponds with the barrier “no clear vision/strategy”. The analysis of the interviews resulted in some additional barriers like incompatible digital transformation scenarios, communication problems between management and employees, unrealistic schedules, and unwillingness to leave the comfort zone.

Some advices for the success of digital transformation projects are also gathered from the interviews: To achieve digital transformation, the company as a whole should be ready, not just the management which initiates the projects in the first place. Companies should hire knowledgeable people who know how these kinds of projects usually go. Because people that are going to use the new system are arguably more important than the CEO or CFO. Top management should always support their employees and be in contact with them during this process, as experts often noticed two sides disconnected. Because of this, departments are unable to plan their schedule to allow time for projects. Another thing that the top management should do is to see the long-term value that the investments would bring. Another issue is that some companies start digital transformation just for the sake of it and do not take it seriously. Companies should exactly know what they want out of digital transformation and goals and desired outcomes of a digital transformation project should be clearly decided. Being psychologically ready for transformation and working in a disciplined manner during projects are also some recommendations emerged from the interviews.

Another purpose of this method was to find out from experts what companies should do about these barriers. These are the results: Hiring knowledgeable and experienced people, Motivating employees for digital transformation, Taking digital transformation seriously, Planning time management of IT departments, having a clear goal before starting the project, Being courageous and open-minded, and Finding a technology suited for their needs, Trusting the consultants, Top management’s support during projects, Being eager for digital transformation, Increasing understanding of digital transformation among employees, Seeing

the value in long-term investments for long-term returns, Investing in small parts in order to reach Industry 4.0,

Future research on barriers to digital transformation in Turkey should focus more on differentiating them between the sectors in which companies operate, in order to give accurate support for specific digital transformation projects.

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