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Digital Transformation In Smes: A Focused Review of The Research Literature

İbrahim YIKILMAZ[1] **Burcu KÖR**[2]

Abstract

Businesses that can develop an appropriate response to the turbulence created by change and diversified customer expectations retain their sustainable competitive advantage. Especially with Covid19, Digital Transformation has emerged as an important element of pressure and necessity on the competitive advantage of businesses. Digital transformation refers to a radical change process from the way of doing business in the industry and the market to the nature of the interaction with internal and external customers. Digital transformation allows for meeting new expectations with new business processes and customer experiences with the opportunities offered by digital technologies. Although Digital transformation offers important competencies for businesses, it seems that SMEs, especially as important actors in the economy, lag behind large enterprises in the digital transformation process. This situation necessitates a detailed consideration of SMEs in the digital transformation process. This study aims to examine Digital Transformation in SMEs in detail. To achieve this, studies investigating digital transformation in SMEs and presenting empirical results were identified from various indexes (Ulakbim, Scopus, Web of Science, and Proquest). The studies were classified according to "author," "date of publication," "type of research," "sample," and "variables." The empirical evidence regarding the digital transformation process of SMEs is presented. The findings of the study are expected to contribute to the literature by presenting empirical studies on Digital Transformation in SMEs comprehensively. Additionally, it will increase awareness of the findings regarding the digital transformation process of SMEs, which are important actors in the economy.

Keywords: Digital Transformation, Digital, SMEs, Barriers, Literature Review

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Kobi'lerde Dijital Dönüşüm: Araştırma Literatürü Odaklı Bir İnceleme

İbrahim YIKILMAZ [1] **Burcu KÖR**[2]

Öz

Değişimin yarattığı türbülans ve çeşitlenen müşteri beklentilerinin gereklerine uygun cevabı geliştirebilen işletmeler, sürdürülebilir rekabet avantajını elinde tutmaktadır. Özellikle Covid19'la beraber işletmelerin rekabet avantajı üzerinde dijital dönüşüm önemli bir baskı ve gereklilik unsuru olarak belirmiştir. Dijital dönüşüm endüstri ve pazar ortamında iş yapış biçiminden, iç ve dış müşteri ile kurulan etkileşimin doğasına kadar köklü bir değişim sürecini ifade etmektedir. Dijital dönüşüm dijital teknolojilerin sunduğu imkanlar ile yeni beklentilerin yeni iş süreçleri ve müşteri deneyimleri ile karşılanmasına imkan sağlar. Her ne kadar Dijital Dönüşüm işletmeler için önemli yetkinlikler sunsa da, özellikle ekonominin önemli bir aktörü olan KOBİ'lerin dijital dönüşüm sürecinde büyük işletmelere nazaran geride kaldıkları görünmektedir. Bu durum dijital dönüşüm sürecinde KOBİ'lerin ayrıntılı bir şekilde ele alınmasını gerekli kılmaktadır. Bu çalışma, KOBİ'lerde Dijital Dönüşümü detaylı bir şekilde incelemeyi amaçlamaktadır. Bunun için çeşitli endekslerden (Ulakbim, Scopus, Web of Science ve Proquest) KOBİ'lerde dijital dönüşümü araştıran ve ampirik sonuçlar sunan çalışmalar belirlenmiştir. Çalışmalar "yazar", "yayın tarihi", "araştırma türü", "örneklem" ve "değişkenler"e göre sınıflandırılmıştır. KOBİ'lerin dijital dönüşüm sürecine ilişkin ampirik sonuçlar paylaşılmıştır. Çalışmanın bulgularının KOBİ'lerde Dijital Dönüşüm ile ilgili ampirik çalışmaları kapsamlı bir şekilde sunarak literatüre katkı sağlaması beklenmektedir. Ayrıca çalışma ekonominin önemli aktörleri olan KOBİ'lerin dijital dönüşüm sürecine ilişkin bulgular konusunda farkındalığı artıracaktır.

Anahtar Kelimeler: Dijital Dönüşüm, Dijital, KOBİ, Engeller, Literatür İncelemesi

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Introduction

Today, businesses operate in environments where competition and uncertainty are intense. In this environment, technological developments have become vital for businesses to continue their operations (Albinson et al., 2016). In fact, "digital transformation" is the most emphasized subject in most business-themed meetings and scientific studies conducted recently (El Hilali, El Manouar & Idrissi, 2020; Redhat, 2018). Digital transformation (DX) can be defined as the integration of technology and the opportunities it offers into business processes and the way of doing business at the stage of responding to the expectations of all stakeholders. DX represents a radical change and a long-term transformation process in informal and formal elements of the business. When it comes to businesses, especially SMEs play a significant role in the economy and social life. According to The World Bank (2022), Small and Medium-sized enterprises (SMEs) are the most common type of enterprise worldwide, accounting for around 90% of all enterprises, especially in emerging economies, and have more than 50% of the labor market. In addition, it has been stated that SMEs will provide opportunities for every 7 out of 10 jobs, especially in emerging markets, among the potential workforce of approximately 600 million new graduates and job demands increasing day by day. Considering the situation in Turkey, which is among the developing countries, SMEs constitute 99.8% of all enterprises (TOBB, 2021). In this context, it is clear that the present, future and sustainable competitive capacity of SMEs will serve the welfare of all stakeholders, both locally and globally. These important roles of SMEs raise the sustainability of their digital transformation performance as a critical issue. Digital transformation makes it possible for SMEs to perform, offer innovative products and services, and gain strategic competitive advantage in an environment of uncertainty and intense competition (Mutluturk, Kor, & Metin, 2021; Abudaqa, Alzahmi, Almujaini & Ahmed, 2022; Chatterjee, Chaudhuri, Vrontis & Basile, 2021; Troise, Corvello, Ghobadian, & O'Regan, 2022).

Digital transformation in SMEs is progressing significantly slowly, despite its significant contributions to both the economy and social life. In the DX process, it is shared that SMEs are left behind despite their high motivation and there are significant resource, expert and budget barriers (OECD, 2021). In addition, a limited number of studies address the current situation, and there are open calls for the need to carry out in-depth studies on how SMEs should adopt digital transformation (Mikalef et al., 2017; Garzoni, De Turi, Secundo & Del Vecchio, 2020). The main purpose of this study is to examine research on the digital transformation process in small and medium-sized enterprises (SMEs). To achieve this, studies examining digital transformation in SMEs and presenting empirical results were identified from various indexes (Ulakbim, Scopus, Web of Science, and Proquest). The identified studies were classified according to the author, publication date, type of research, sample, and variables. Important results and suggestions are shared in the study. The study extends the emerging digital transformation literature to systematically review DX studies in SMEs. In addition, this study will make a significant contribution to the effective management of DX by raising awareness among policymakers and top managers about barriers and suggestions.

Conceptual Framework

Digital Transformation and SMEs

Digital transformation (DX) is a process that allows businesses to adopt novel methods and models of operation that serve the development of both enterprises and the welfare of society in today's uncertainty-intensive industrial environment, where concerns for efficiency and productivity are increasing (Yıkılmaz, 2021; Yıkılmaz & Sürücü, 2021). DX also allows effective solutions to be presented within the managerial process (Özdemir, Mutluturk, Kör & Metin, 2019). DX is "an investment in human resources and technology to navigate a business that is ready to adapt to growth and change towards the foreseeable future" (Rowe, 2017). DX is a fundamental change process enabled by digital technologies for innovation and radical improvement for a business to create value (Gong & Ribiere, 2021). With these aspects, it is a philosophical transformation that includes change and transformation processes for businesses and aims for innovation, development, and harmony in the social and economic field.

The digital transformation process includes the comprehensive development and transformation of business processes, human resources, organizational culture, organizational structure, and information and communication systems within the framework of technological facilities (Tangi, Janssen, Benedetti & Noci, 2020). An effective transformation in each highlighted element is important for the sustainability of DX.

Although the concepts of digitization, digitalization, and digital transformation are often used interchangeably, there are important differences between them (Renitz, 2020). Figure 1 below presents the differences between these and their relationship in detail.

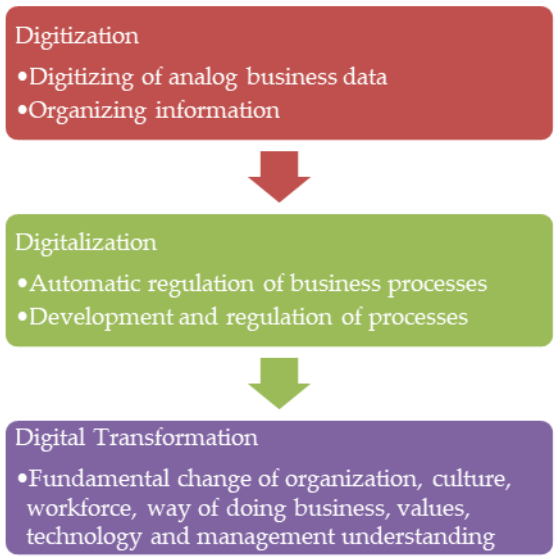

Figure 1: Stages of Digital Transformation

As presented in detail in Figure 1, digital transformation actually represents a radical transformation rather than the digitization of certain technological opportunities in certain departments or ways of doing business. In addition, "Digitization and

Digitalization" are the stages that the business goes through until it reaches the DX process, and describe the stages of preparing the business for digital transformation.

The digital transformation process has recently become an important issue for all large and small businesses. Especially in SMEs, it is seen that digital transformation is handled separately both in academia and top management (Cha et al., 2015: Li et al., 2018). SMEs play important roles in economic and social life. In order to sustain their competitive advantage, they must significantly integrate developing technological facilities into their organization. It is stated that in the DX process, SMEs are more motivated for transformation compared to large enterprises (OECD, 2021). Behind these motivations are the important competencies offered by digital transformation. According to several studies (Mutluturk, Kor, & Metin, 2021; Abudaqa, Alzahmi, Almujaini & Ahmed, 2022; Chatterjee, Chaudhuri, Vrontis & Basile, 2021; Scuotto, et al., 2021; Scuotto, Arrigo, Candelo & Nicotra, 2019; Troise, Corvello, Ghobadian & O'Regan, 2022), digital transformation is essential for small and medium-sized enterprises (SMEs) to increase their innovation capacity, meet the expectations of diverse stakeholders, and differentiate their products and services (Min &Kim, 2021). DX also increases brand awareness and the firm reputation (Matarazzo, Penco, Profumo, & Quaglia, 2021), which is an important selection criterion for customers. Again, empirical studies have determined that DX increases the internationalization ability (Yu, Fletcher & Buck, 2022), organizational resilience (Khurana, Dutta & Ghura, 2022), and organizational performance and revenue (Rupeika-Apoga, Petrovska, & Bule, 2022; Savastano, Zentner, Spremić, & Cucari, 2022; Jeza, & Lekhanya, 2022; Chen, Jaw, & Wu, 2016), which are important parameters in achieving sustainable competitiveness of the organization.

The OECD (2021) report reveals that despite the significant contributions of digital transformation, SMEs are lagging behind. The report shares that SMEs prioritize marketing and administrative processes in digital adoption, and that their efforts decrease with the complexity of technological applications. Additionally, it emphasizes that interest and development differ significantly on a sectoral basis. Although micro-enterprises were excluded from the analysis, SMEs still lagged in the DX process. Furthermore, the report states that digital security risks increase due to the low competency of SMEs with the DX process. It is a costly process, and they have problems with operative processes, especially on digital platforms. As can be seen, the situation of SMEs in the DX process is far behind compared to large enterprises and includes important issues that need solutions. The subject needs to be dealt with in detail. In this context, the studies that deal with digital transformation, which are carried out empirically, are examined and shared in detail in the next sections.

Methodology

The main goal of this study is to discover research that focuses on the process of digital transformation in SMEs and provide recommendations by sharing the findings of these studies. To identify relevant literature, the systematic review method was employed, which entails following specific procedures to choose and present research results in line with the study's objectives (Littell, Corcoran & Pillai, 2008). In determining the studies for systematic review, the inclusion criteria were empirical research (qualitative or quantitative) published at any time that examined the issues of digital transformation in SMEs. Studies were targeted to be examined comprehensively, and an exploration

was carried out using the digital libraries of Ulakbim, Scopus, Web of Science, and Proquest. "Digital transformation", "SMEs", "Dijital Dönüşüm" ve "KOBİ" were used as keywords in the identification of related studies. A total of 99 studies were identified in the initial search. Studies that did not meet the inclusion criteria or were duplicates were excluded. After this screening, a total of 37 studies were selected for inclusion in the review. These 37 studies include all available studies that provide empirical results. The publications were classified based on their author, date of publication, sample size, and variables. After classification, the findings and results of the studies were presented in detail.

Findings

Table 1 presents the descriptive information of 37 studies that were selected based on the inclusion criteria and the main purpose of the study.

Table 1: Information about Empirical Studies on Digital Transformation in SMEs

No	Author/s	Title	Sample	Variables
1	Abudaqa, Alzahmi, Almujaini & Ahmed (2022)	Does innovation moderate the relationship between digital facilitators, digital transformation strategies and overall performance of SMEs of UAE?	Manufacturing SMEs in UAE	Innovation digital facilitators, digital transformation strategies performance
2	Ates & Acur (2022)	Making obsolescence obsolete: Execution of digital transformation in a high-tech manufacturing SME	22 in-depth interviews with high-tech SMEs	Digital transformation
3	Birkel & Wehrle (2022)	Small- and Medium-Sized Companies Tackling the Digital Transformation of Supply Chain Processes: Insights From a Multiple Case Study in the German Manufacturing Industry	Multiple case study with 15 highly knowledgeable stakeholders from seven companies within the German manufacturing industry	Digital Transformation Supply Chain Processes
4	Brodeur, Pellerin, & Deschamps, (2021)	Collaborative approach to digital transformation (CADT) model for manufacturing SMEs	2 aerospace SMEs in North America	Digital transformation (CADT) model
5	Candelo, Casalegno & Civera, (2021)	Digital transformation or analogic relationships? A dilemma for small retailer entrepreneurs and its resolution	100 small retailer entrepreneurs (Italy)	Digital transformation
6	Cannas, (2021)	Exploring digital transformation and dynamic capabilities in agrifood SMEs	In-depth interviews of 21 key respondents in Sardinia (Italy).	Digital transformation Dynamic capabilities

7	Chatterjee, Chaudhuri, Vrontis, & Basile, (2021)	Digital transformation and entrepreneurship process in SMEs of India: a moderating role of adoption of AI-CRM capability and strategic planning	315 respondents from IndianSMES	Digital transformation Entrepreneurship process Adoption of AI-CRM capability Strategic planning
8	Chen, Jaw, & Wu (2016)	Effect of digital transformation on organisational performance of SMEs Evidence from the Taiwanese textile industry's web portal	8 senior executives of small- and medium-sized enterprises (SMEs) in the Taiwanese textile industry.	Digital transformation Organisational performance
9	Coronado-Medina, Arias-Pèrez, & Perdomo-Charry, (2020)	Fostering product innovation through digital transformation and absorptive capacity	102 Colombian manufacturing and service companies (77 SMEs+25 large companies)	Product innovation Digital transformation Absorptive capacity
10	Crupi, et al. (2020)	The digital transformation of SMEs– a new knowledge broker called the digital innovation hub	11 DIHs represented by 1 university consortium, 2 regional clusters and 8 industrial and artisan associations	Digital transformation Digital innovation hub
11	El Hilali, El Manouar, & Idrissi (2020).	Reaching sustainability during a digital transformation: a PLS approach	41 SMEs in Morocco	Sustainability Digital transformation
12	Erbay, & Yıldırım (2022)	Combined Technology Selection Model for Digital Transformation in Manufacturing: A Case Study From the Automotive Supplier Industry	11 experts	Digital Transformation Technology Selection Model
13	Garzoni, De Turi, Secundo, & Del Vecchio, (2020)	Fostering digital transformation of SMEs: a four levels approach	Interviews with seven key informants (top management and project managers)	Digital transformation
14	Kääriäinen, Pussinen, Saari, Kuusisto, Saarela, &	Applying the positioning phase of the digital transformation model in practice for SMEs: toward systematic development of digitalization	19 SMEs in Northern Ostrobothnia, Finland	The Phase of the digital transformation model
15	Khurana, IDutta, & Ghura, (2022)	SMEs and digital transformation during a crisis: The emergence of resilience as a second-order dynamic capability in an entrepreneurial ecosystem	8 entrepreneurs in India	digital transformation resilience dynamic capability

16	Kraft, Lindeque, & Peter, (2022).	The digital transformation of Swiss small and medium-sized enterprises: insights from digital tool adoption	1,593 respondents to a survey of Swiss SMEs	Digital transformation Digital tool adoption
17	Martinelli, Farioli, & Tunisini, (2021).	New companies' DNA: the heritage of the past industrial revolutions in digital transformation	3 Italian manufacturing companies: Biesse Group, Bianchi SpA, and Irca SpA of Zoppas Industries SpA.	Digital transformation
18	Matarazzo, Penco, Profumo, & Quaglia, (2021)	Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective	multi-case study research on six Italian SMEs (the food, fashion, and furniture design industries)	Digital transformation Customer value creation
19	Min, & Kim, (2021)	SMEs' Digital Transformation Competencies on Platform Empowerment: A Case Study in South Korea	361 SME executives and employees in South Korea.	Digital Transformation Competencies Platform Empowerment
20	Bui (2021)	A Journey of Digital Transformation of Small and Medium-Sized Enterprises in Vietnam: Insights from Multiple Cases	6 SMEs in Vietnam	Digital Transformation
21	Hoa & Tuyen, (2021)	A Model For Assessing The Digital Transformation Readiness For Vietnamese SMEs	510 companies from different sectors	Digital Transformation Readiness
22	Pelletier ,& Cloutier (2019)	Conceptualising digital transformation in SMEs: an ecosystemic perspective	39 participants (SMEs manager)	Digital transformation
23	Peter, Kraft & Lindeque, (2020)	Strategic action fields of digital transformation An exploration of the strategic action fields of Swiss SMEs and large enterprises	2,590 participants from 1,854 organisations	Digital transformation
24	Rupeika-Apoga, Petrovska, & Bule, (2022)	The Effect of Digital Orientation and Digital Capability on Digital Transformation of SMEs during the COVID-19 Pandemic	246 SMEs in Latvia	Digital Orientation Digital Capability Digital Transformation
25	Savastano, Zentner, Spremić, & Cucari, (2022	Assessing the relationship between digital transformation and sustainable business excellence in a turbulent scenario	Executives of 162 SMEs in the tourism sector	Digital transformation Sustainable business excellence
26	Scuotto, Nicotra, Del Giudice, Krueger, & Gregori,	A microfoundational perspective on SMEs' growth in the digital transformation era	2017 Eurostat's dataset (2,156,360 SMEs)	digital transformation microfoundational perspective

27	Scuotto, Arrigo, Candelo, & Nicotra, (2019)	Ambidextrous innovation orientation effected by the digital transformation: A quantitative research on fashion SMEs	853 (SMEs) in the Italian fashion industry	Ambidextrous innovation orientation Digital transformation
28	Soluk, & Kammerlander, (2021).	Digital transformation in family-owned Mittelstand firms: A dynamic capabilities perspective	127 interviews in a multiple case study of 15 SMEs	Digital transformation dynamic capabilities
29	Trischler, & Li-Ying, (2022)	Exploring The Relationship Between Multi-Dimensional Digital Readiness and Digital Transformation Outcomes	207 Danish SMEs	Digital Readiness Digital Transformation Outcomes
30	Troise, Corvello, Ghobadian, & O'Regan, (2022)	How can SMEs successfully navigate VUCA environment: The role of agility in the digital transformation era	204 innovative SMEs in Italy	Agility Digital transformation
31	Ngo, Pham, & Nguyen. (2022)	Drivers of digital supply chain transformation in SMEs and large enterprises– a case of COVID-19 disruption risk	923 firms in Vietnam (SMEs and large enterprises)	Drivers of digital supply chain transformation
32	Yu, Fletcher, & Buck, (2022).	Managing digital transformation during re-internationalization: Trajectories and implications for performance	11 Chinese international SMEs	Digital transformation Re-internationalization
33	Anim-Yeboah, Boateng, Odoom, & Kolog,. (2020)	Digital transformation process and the capability and capacity implications for small and medium enterprises	8 SMEs on an e-commerce platform in Ghana	Digital transformation process
34	Fachrunnisa, Adhiatma, Lukman, & Ab Majid, (2020)	Towards SMEs' digital transformation: The role of agile leadership and strategic flexibility	539 SMEs in Indonesia and Malaysia	agile leadership strategic flexibility digital transformation
35	Jeza, & Lekhanya, (2022)	The influence of digital transformation on the growth of Small and medium enterprises in South Africa	8 interviews with SME managers in the Durban area.	Digital transformation
36	Rupeika-Apoga, Bule, & Petrovska, (2022)	Digital Transformation of Small and Medium Enterprises: Aspects of Public Support	425 Latvian SMEs	Digital Transformation
37	Ano & Bent, (2021)	Human determinants influencing the digital transformation strategy of multigenerational family businesses: a multiple-case study of five French growth-oriented family firms	5 French family firms	Digital transformation strategy

When the 37 studies identified are examined, there has been a noticeable increase in the number of studies focusing on digital transformation in small and medium-sized enterprises (SMEs) in recent years (Figure 2).

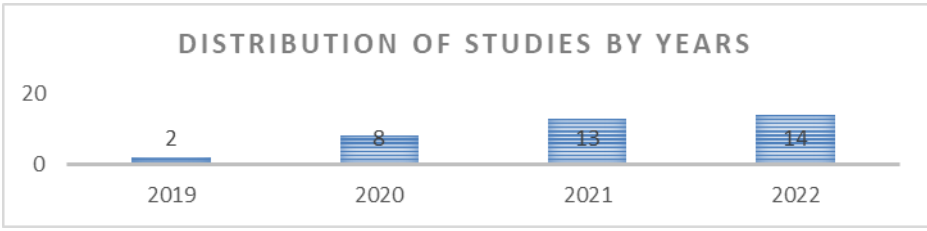

Figure 2: Distribution of studies by years

In addition, analysis was carried out on keywords in the studies. The co-occurrence map of keywords used two or more times is presented in Figure 3.

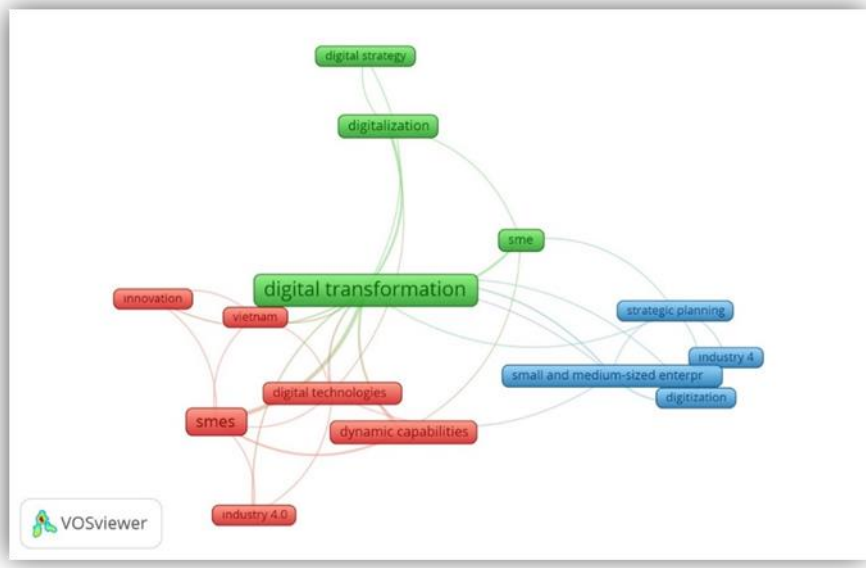

Figure 3: Keyword Co-occurrence Map

As a result of the examination, the findings will be summarized under two headings.

Recommendations Highlighted in Studies For Effective Adoption Of The DX

Digital transformation encompasses the integration of information and communication technologies to transform all processes of the business. In this process, it is not appropriate to transfer only technology to the enterprise. For an effective DX process, it is necessary to focus on the non-cognitive dynamic capacity of the enterprise, including both the informal and formal parts (Pelletier & Cloutier, 2019; Ates & Acur, 2022). Therefore, it is clear that SMEs need to develop their noncognitic capabilities by considering their social organizational dynamics. DX is a fundamental transformational

move for the business and should be reflected in its culture, collective behavior, and internal response dynamics. In this positive cultural environment, it is important for employees to consider their work in the change process as a family environment, in overcoming the uncertainties that DX will create (Cannas, 2021).

The DX should be carried out in a transformation process that is suitable for the needs, expectations, product, and service offerings of the enterprises. Upon reviewing the studies conducted in this context, it is important for a successful DX to realize *"a tailerod digital transformation process"* to the business, that is, in accordance with the specific expectations and needs of SMEs (Brodeur, Pellerin, & Deschamps, 2021). In addition, it was shared that a balanced approach and management practice between local-global and tradition-innovation within the digital transformation process is important for the sustainability and effectiveness of DX (Martinelli, Farioli, & Tunisini, 2021).

It is important for an effective DX to consider the expectations and suggestions of all internal and external stakeholders. By creating synergy in the transformation process with the trust and participation of all stakeholders, an important strategic advantage can be established both in creating new products and ideas and in overcoming the problems that may arise (Chatterjee, Chaudhuri, Vrontis, & Basile, 2021; Candelo, Casalegno & Civera, 2021). In addition, this synergy will increase knowledge sharing and solidarity within the enterprise (Cannas, 2021). Also, understanding a customer experience-oriented business model i is an important factor in the sustainability of the DX process (Crupi, et al., 2020).

It is considered that the development of a platform or web portal for SMEs in the digital transformation process is important in terms of using resources effectively and accelerating change management process. In fact, some studies have found that such interactions increase the transformation process and performance of businesses (Chen, Jaw, & Wu, 2016; Min, & Kim, 2021; Kääriäinen et.al., 2021). Additionally, it is stated that while the awareness of the enterprises in the value chain increases with platform-based interaction, their integration will also be easier due to the use of similar infrastructures. For example, a study found that a web portal offering digital transformation tools has significant benefits in analyzing the current situation for the company's DX and correctly determining its needs (Matarazzo, Penco, Profumo, & Quaglia, 2021; Kääriäinen et al., 2021; Scuotto, Arrigo, Candelo, & Nicotra, 2019). In addition to the platform and web portal, it has been shared that the knowledge and technology transfers and knowledge brokerage activities offered by the Digital Innovation Hubs have made significant contributions to the adoption and integration of technological developments in the DX process of enterprises (Crupi, et al., 2020). It has also been empirically demonstrated that each digital capability and tool owned by businesses in the transformation positively affects the DX process (Scuotto, Nicotra, Del Giudice, Krueger, & Gregori, (2021).

For SMEs to successfully progress in DX, it is important to direct their focus to the non-business area rather than traditional management and business approaches, to properly analyze opportunities and threats. In fact, a study found that digital transformation has an important impact on the resilience of businesses during crises, and that focusing on environmental factors rather than core operations can offer them resilience (Khurana, Dutta & Ghura, 2022).

In the DX process, it is an important issue for businesses to determine an appropriate strategy and a suitable digital transformation roadmap in order to achieve effective results (Trischler & Li-Ying, 2022). Adopting an appropriate strategy and having sufficient digital readiness in accordance with the requirements of this strategy positively affect the progress of DX. It has also been shared that adopting a long-term strategy is an important strategic start for SMEs that have the goal of internationalization (Yu, Fletcher, & Buck, 2022).

The DX process is long-term endeavor, and it is important to determine the environmental changes and their impact on the business. Empirical evidence has demonstrated that adopting an agile leadership approach, which can be defined as a leadership style that closely follows environmental changes in businesses and can properly read expectations, is a key element for the proper implementation and effectiveness of DX strategies (Fachrunnisa, Adhiatma, Lukman, & Ab Majid, 2020).

Barriers Encountered in the DX Process

The DX process is an approach that integrates all formal and informal structural processes of the organization. In this transformation process, the support of top management and their attitude towards the seriousness of the issue significantly affect the effectiveness of the DX process. In a study conducted in this context, a decrease in the support of top management negatively affected the performance of the digital transformation process (Birkel & Wehrle, 2022). The study showed that following the start of the DX process with great interest, the decrease in attention and commitment of senior management to the DX process overshadowed the effectiveness of the process. Additionally, top management's failure to determine a clear roadmap for the DX process, that is, adoptinga haphazard approach, caused uncertainty and emerged as an important barrier to the DX process.

Another important issue in the disruption of the DX process is the lack of competent and expert human resources as well as insufficient budget within the enterprise (Erbay, & Yıldırım,2022; Kraft, Lindeque, & Peter, 2022; Anim-Yeboah, Boateng, Odoom, & Kolog, 2020; Garzoni, De Turi, Secundo, & Del Vecchio, 2020). Studies on this subject have shown that businesses face significant problems in terms of technical personnel and information, which is a serious barrier to DX progress. It has been suggested that this issue can be overcome with the help of technology transfer offices and entrepreneur support programs.

The effectiveness of change management in DX, which represents a radical change process, significantly affects the sustainability of the process. In some studies conducted in this context, significant resistance to change is observed within the organization (Bui, 2021; Soluk, & Kammerlander, 2021). Among the sources that feed this resistance are the low level of stakeholder awareness and the possibility of customers being neglected for a certain period during the transformation process. In addition, it has been noted that the products offered by SMEs are generally innovative and of sufficient quality, and that the expectations of external stakeholders from SMEs are relatively stable, which fosters resistance to change. The low stakeholder awareness, which is one of the main problems that feed the resistance to change, and especially the low DX readiness of the business significantly affects the effectiveness of DX in the medium and long term. In a study conducted, the DX readiness levels of enterprises were classified into three levels

(newcomers, learners, and leaders), and 510 companies covering various sectors were examined (Hoa & Tuyen, 2021). The study determined that while DX caused an increase in productivity and performance for a while in companies in the first two stages (newcomers, learners), DX sustainability decreased after a certain period. The reason for this decline is explained by the transfer of jobs to automation and the neglect of psycho-social processes in this transfer process. However, it was noted that this situation was not observed in businesses defined as leaders with high DX readiness levels. Therefore, the DX readiness of the employees, that is, the perception and competence of the workforce at the level of transition to the digital workflow and environment, is an important factor in the sustainability of digital transformation, and it is a major barrier when not managed properly.

Another important barrier that SMEs face in the digital transformation process is the need for significant support. In a conducted study, 425 Latvian SMEs were examined and important results were obtained in this regard. The study emphasized that SMEs could not carry out the DX process without EU support and government incentives and that a significantly inclusive policy should be developed, from competent human resources to tax reductions (Rupeika-Apoga, Bule, & Petrovska, 2022).

Conclusion

Technological advances and diversifying customer expectations keep the issue of digital transformation, which represents an important radical change process from the way businesses do business to their management philosophies, as a hot topic on the agenda of top management. Especially with the recent pandemic and economic crises experienced on a global scale, the need and the pressure for DX have increased even more. In this portrait, a heavy responsibility has been added to the responsibilities of SMEs, who are one of the main elements of the economy. DX responsibility has also become a strategic competitive advantage and even an element that determines the organizational lifecycle. The innovation capacity, agility, resilience, and increase in organizational performance and revenue offered to the business by digital transformation enable it to gain strategic advantage by managing diversified expectations properly. However, in the empirical studies conducted and shared above, SMEs cannot carry out a sustainable DX process compared to large enterprises, despite their share in the economy, the necessity of digital transformation and their high DX motivations. This situation appears as some structural issues as well as issues related to an ecosystem for transformation. In this context, it is considered appropriate to present inclusive solutions on the following issues to effectively manage the DX process:

- In the digital transformation process, an inclusive understanding should be considered. This means an approach that takes into account both informal and formal dynamics. The DX process perspective should go beyond technology transfer alone.
- Instead of using standard approaches in the DX process, a business-specific digital transformation approach should be created. This can be achieved by properly evaluating the industry and stakeholder expectations of the business. The glocal (global and local) balance should be established by considering the main capability of the business and preventing alienation. The sustainability of the DX process of SMEs is hindered by the lack of expert human and budget

resources. Necessary measures must be taken within the framework of effective governance to prevent this obstacle. A platform that includes digital transformation tools should be provided to SMEs to offer interaction with other businesses or experts in the value chain, thereby providing the trust, participation, awareness, and self-efficacy needed. Considering the added value of the DX of SMEs to the national and world economy, comprehensive government policies including tax and investment supports should be developed.

- The number and qualifications of the Digital Innovation Hubs and entrepreneur support programs should be increased, and expert and knowledge gaps should be closed through knowledge and technology transfers.
- It has been determined within the scope of the current study that the number of academic studies should be increased. In this context, it is important to increase the number of quantitative studies in addition to qualitative studies to include various sectors (agriculture, tourism, food, textile, etc., apart from the IT sector). More inclusive and guiding empirical results in the DX journey will make significant contributions to the effectiveness of DX strategies and overcoming resistance to change.
- For businesses to evaluate themselves, a standard (regulation) that measures and classifies their digital readiness on a sectoral basis should be developed, and an appropriate investment and support requirement should be introduced for these levels of businesses. This should enable businesses to adopt longer and more inclusive DX strategies and set a clear roadmap. These regulations can prevent the uncertainty and related inefficiency that internal and external stakeholders may experience.
- Top management is an important actor in digital transformation. Organizing awareness training for the development of managerial skills and the vision of top management will be beneficial in creating a more agile, aware, and innovative organizational climate. Additionally, transformation expert support should be provided to manage change in the business, which can intervene in the noncognitive elements of the business.

Digital transformation is becoming a necessity rather than a choice, due to the strategic advantages it offers businesses and its contributions to social welfare and the future. In this process, it should be taken into account that the effectiveness and sustainability of the DX process serve collective welfare by taking responsibility for all stakeholders. In this context, it is important to consider the steps needed to address the aforementioned issues and quickly seize the opportunities that digital transformation offers. Both top management and policymakers should approach it with awareness that digital transformation is a vital, deep-rooted, and inclusive transformative element, rather than just a popular managerial activity involving the use of digital technology. All parties must accurately identify barriers and ensure the efficient use of resources by both the enterprise and the public. In this context, it would be appropriate to address the issues shared in the study by the business and policymakers and to increase awareness and participation of all stakeholders on these issues.

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References / Kaynakça

Abudaqa, A., Alzahmi, R. A., Almujaini, H., & Ahmed, G. (2022). Does innovation moderate the relationship between digital facilitators, digital transformation strategies and overall performance of SMEs of UAE?. *International Journal of Entrepreneurial Venturing*, 14(3), 330-350.

Albinson, N., Blau,A. & Chu, Y. (2016). *The Future of Risk*, New Game New Rules, Deloitte, New York, NY.

Anim-Yeboah, S., Boateng, R., Odoom, R., & Kolog, E. A. (2020). Digital transformation process and the capability and capacity implications for small and medium enterprises. *International Journal of E-Entrepreneurship and Innovation* (IJEEI), 10(2), 26-44.

Ano, B., & Bent, R. (2021). Human determinants influencing the digital transformation strategy of multigenerational family businesses: a multiple-case study of five French growth-oriented family firms. *Journal of Family Business Management*, (ahead-of-print).

Ates, A., & Acur, N. (2022). Making obsolescence obsolete: Execution of digital transformation in a high-tech manufacturing SME. *Journal of Business Research*, 152, 336-348.

Birkel, H., & Wehrle, M. (2022). Small-and Medium-Sized Companies Tackling the Digital Transformation of Supply Chain Processes: Insights From a Multiple Case Study in the German Manufacturing Industry. *IEEE Transactions on Engineering Management*. doi: 10.1109/TEM.2022.3209131.

Brodeur, J., Pellerin, R., & Deschamps, I. (2021). Collaborative approach to digital transformation (CADT) model for manufacturing SMEs. *Journal of Manufacturing Technology Management*. 33(1), 61-83

Bui, M. L. (2021). A journey of digital transformation of small and medium-sized enterprises in Vietnam: Insights from multiple cases. *The Journal of Asian Finance, Economics and Business*, 8(10), 77-85.

Candelo, E., Casalegno, C. G., & Civera, C. (2021). Digital transformation or analogic relationships? A dilemma for small retailer entrepreneurs and its resolution. *Journal of Strategy and Management*. 15 (3), 397-415

Cannas, R. (2021). Exploring digital transformation and dynamic capabilities in agrifood SMEs. *Journal of Small Business Management*, 1-27.

Cha, K.J., Hwang, T. & Gregor, S. (2015).An integrative model of IT-enabled organizational transformation: a multiple case study. *Management Decision*, 53(8), 1755-1770.

Chatterjee, S., Chaudhuri, R., Vrontis, D., & Basile, G. (2021). Digital transformation and entrepreneurship process in SMEs of India: a moderating role of adoption of AI-CRM capability and strategic planning. *Journal of Strategy and Management*. 15(3), 416-433

Chen, Y. Y. K., Jaw, Y. L., & Wu, B. L. (2016). Effect of digital transformation on organisational performance of SMEs: Evidence from the Taiwanese textile industry's web portal. *Internet Research*. 26 (1), 186-212

Coronado-Medina, A., Arias-Pérez, J., & Perdomo-Charry, G. (2020). Fostering product innovation through digital transformation and absorptive capacity. *International Journal of Innovation and Technology Management,* 17(06), 2050040.

Crupi, A., Del Sarto, N., Di Minin, A., Gregori, G. L., Lepore, D., Marinelli, L., & Spigarelli, F. (2020). The digital transformation of SMEs-a new knowledge broker called the digital innovation hub. *Journal of Knowledge Management.* 24 (6), 1263-1288.

El Hilali, W., El Manouar, A., & Idrissi, M. A. J. (2020). Reaching sustainability during a digital transformation: a PLS approach. *International Journal of Innovation Science.* 12 (1), 52-79.

Erbay, H., & Yıldırım, N. (2022). Combined Technology Selection Model for Digital Transformation in Manufacturing: A Case Study From the Automotive Supplier Industry. *International Journal of Innovation and Technology Management*, 2250023.

Fachrunnisa, O., Adhiatma, A., Lukman, N., & Ab Majid, M. N. (2020). Towards SMEs' digital transformation: The role of agile leadership and strategic flexibility. *Journal of Small Business Strategy*, 30(3), 65-85.

Garzoni, A., De Turi, I., Secundo, G., & Del Vecchio, P. (2020). Fostering digital transformation of SMEs: a four levels approach. *Management Decision*. 58 (8), 1543-1562

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

Hoa, N. T. X., & Tuyen, N. T. (2021). A model for assessing the digital transformation readiness for Vietnamese SMEs. *Journal of Eastern European and Central Asian Research (JEECAR*), 8(4), 541-555.

Jeza,S. & Lekhanya,L.M. (2022). The influence of digital transformation on the growth of small and medium enterprises in South Africa. *Problems and Perspectives in Management*, 20(3), 297-309.

Kääriäinen, J., Pussinen, P., Saari, L., Kuusisto, O., Saarela, M., & Hänninen, K. (2021). Applying the positioning phase of the digital transformation model in practice for SMEs: toward systematic development of digitalization. *International journal of information systems and project management*, 8(4), 24-43.

Khurana, I., Dutta, D. K., & Ghura, A. S. (2022). SMEs and digital transformation during a crisis: The emergence of resilience as a second-order dynamic capability in an entrepreneurial ecosystem. *Journal of Business Research,* 150, 623-641.

Kraft, C., Lindeque, J. P., & Peter, M. K. (2022). The digital transformation of Swiss small and medium-sized enterprises: insights from digital tool adoption. *Journal of Strategy and Management*. 15 (3), 468-494.

Li, L., Su, F., Zhang, W. & Mao, J.Y. (2018). Digital transformation by SME entrepreneurs: a capability perspective. Information Systems Journal, 28(6), 1129-1157.

Littell, J. H., Corcoran, J. & Pillai, V. (2008). *Systematic Reviews and Meta-Analysis*. UK: Oxford University Press.

Martinelli, E. M., Farioli, M. C., & Tunisini, A. (2021). New companies' DNA: the heritage of the past industrial revolutions in digital transformation. *Journal of Management and Governance*, 25(4), 1079-1106.

Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2021). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, 123, 642-656.

Min, S. A., & Kim, B. Y. (2021). SMEs' digital transformation competencies on platform empowerment: A case study in South Korea. *The Journal of Asian Finance, Economics and Business*, 8(6), 897-907.

Mikalef, P., Pappas, I. O., Krogstie, J., & Giannakos, M. (2018). Big data analytics capabilities: a systematic literature review and research agenda. *Information Systems and e-Business Management*, 16(3), 547-578.

Mutluturk, M., Kor, B., & Metin, B. (2021). *The role of Edge/Fog computing security in IoT and Industry 4.0 infrastructures: Edge/Fog-based security in Internet of Things.* In Handbook of research on information and records management in the fourth industrial revolution (pp. 211-222). IGI Global.

Ngo, V.M., Pham, H.C. & Nguyen, H.H. (2022). Drivers of digital supply chain transformation in SMEs and large enterprises - a case of COVID-19 disruption risk, *International Journal of Emerging Markets,* Vol. ahead-of-print . https://doi.org/10.1108/IJOEM-10-2021-1561

OECD (2021). *The Digital Transformation of SMEs, OECD Studies on SMEs and Entrepreneurship*, OECD Publishing, Paris, https://doi.org/10.1787/bdb9256a-en.

Özdemir, S., Mutlutürk, M., Kör, B., & Metin, B. (2019, October). Country of Origin Criteria for Digitalization with National IT Products. *In 6th International Management Information Systems Conference* 2019

Pelletier, C., & Cloutier, L. M. (2019). Conceptualising digital transformation in SMEs: an ecosystemic perspective. *Journal of Small Business and Enterprise Development*. 26 (6/7),. 855-876.

Peter, M. K., Kraft, C., & Lindeque, J. (2020). Strategic action fields of digital transformation: An exploration of the strategic action fields of Swiss SMEs and large enterprises. *Journal of Strategy and Management*. 3 (1), 160-180

Redhat (2018). *What is digital transformation? The enterprisers project: a community of CIOs discussing the future of business and IT*, available at: https://enterprisersproject.com/what-isdigital-transformation (accessed 12.10.2022)

Renitz, G. (2020). *Consider the Three Ds When Talking about Digital Transformation.* Avaliable at: https://er.educause.edu/blogs/2020/6/consider-the-three-ds-when-talking-about-digitaltransformation. Date of access: 06.10.2022

Rowe, S.D. (2017). Digital transformation needs to happen: the clock is ticking for companies that have been unwilling to embrace change. *Customer Relationship Management*. 30-33

Rupeika-Apoga, R., Bule, L., & Petrovska, K. (2022). Digital transformation of small and medium enterprises: Aspects of public support. *Journal of Risk and Financial Management*, 15(2), 45.

Rupeika-Apoga, R., Petrovska, K., & Bule, L. (2022). The Effect of Digital Orientation and Digital Capability on Digital Transformation of SMEs during the COVID-19 *Pandemic. Journal of Theoretical and Applied Electronic Commerce Research,* 17(2), 669-685.

Savastano, M., Zentner, H., Spremi, M., & Cucari, N. (2022). Assessing the relationship between digital transformation and sustainable business excellence in a turbulent scenario. *Total Quality Management & Business Excellence*, 1-22.

Scuotto, V., Arrigo, E., Candelo, E., & Nicotra, M. (2019). Ambidextrous innovation orientation effected by the digital transformation: A quantitative research on fashion SMEs. *Business Process Management Journal*, 26(5), 1121-1140.

Scuotto, V., Nicotra, M., Del Giudice, M., Krueger, N., & Gregori, G. L. (2021). A microfoundational perspective on SMEs' growth in the digital transformation era. *Journal of Business Research*, 129, 382-392.

Soluk, J., & Kammerlander, N. (2021). Digital transformation in family-owned Mittelstand firms: A dynamic capabilities perspective. *European Journal of Information Systems*, 30(6), 676-711.

Tangi, L., Janssen, M., Benedetti, M., & Noci, G. (2020, August). *Barriers and Drivers of Digital Transformation in Public Organizations: Results from a Survey in the Netherlands*. International Conference on Electronic Government (pp. 42-56). Springer, Cham.

The World Bank (2022). *Small and Medium Enterprises (SMEs) Finance* Avaliable at: https://www.worldbank.org/en/topic/smefinance, date of access:12.10.2022

TOBB (2021). *Türkiye'nin KOBİleri Bülteni.* Avaliable at: https://www.tobb.org.tr/KobiArastirma/Sayfalar/TRninKOBIleriBulteni.php, date of access:12.10.2022

Trischler, M. F. G., & Li-Ying, J. (2022). Exploring The Relationship Between Multi-Dimensional Digital Readiness And Digital Transformation Outcomes. *International Journal of Innovation Management*, 26(03), 2240014.

Troise, C., Corvello, V., Ghobadian, A., & O'Regan, N. (2022). How can SMEs successfully navigate VUCA environment: The role of agility in the digital transformation era. *Technological Forecasting and Social Change*, 174, 121227.

Yıkılmaz, İ. & Sürücü, L. (2021). *Dijital Çağda Liderliğin Yeni Yüzü: Dijital Liderlik*., İ. Erdoğan Tarakçı ve B. Göktaş (Ed.).Dijital Gelecek Dijital Dönüşüm 2,içinde (301- 315 ss.) İstanbul: EFE Akademi

Yıkılmaz, İ. (2021). *Covid-19 Pandemic As A Digital Transformation Catalyst*. M. Meciar and H.Şimşek (Ed.) The Social and Economic Impact of Covid-19: Rapid Transformation of the 21st Century Society, içinde (119-138 ss.). London: IJOPEC Publications

Yu, H., Fletcher, M., & Buck, T. (2022). Managing digital transformation during re-internationalization: Trajectories and implications for performance. *Journal of International Management*, 28(4), 100947.