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THE TRANSFORMATION PROCESS OF TURKISH SMES IN TERMS OF DIGITALIZATION AND SUSTAINABILITY

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Abstract

Digitalization and sustainability are no longer contentious topics in today's world. Digital innovation and ecological actions constantly evolve, affecting a company's strategy, structure, operations, and performance. These developments are particularly important for growing economies such as Türkiye. Small and medium-sized enterprises (SMEs) are essential to the Turkish economy, providing 72 % of employment. The utilization of digital innovations and sustainability approaches is having an increasingly positive impact on the growth of SMEs in today's business environment. This article focuses on the transformative process of Turkish SMEs toward sustainability and digitalization. The data were from the Flash Eurobarometer 486, which compares the average of 27 EU countries to Türkiye. As a result of the study, it is understood that sustainability and digitalization continue to be underused in Turkish SMEs, primarily due to high investment requirements and a scarcity of financial resources.

Keywords: *Digitalization, Sustainability, Transition, SME, Türkiye*
JEL Classification: *M10, M11, M13, M14, M15, M19*

DİJİTALLEŞME VE SÜRDÜRÜLEBİLİRLİK AÇISINDAN TÜRK KOBİ'LERİNİN DÖNÜŞÜM SÜRECİ

Öz

Dijitalleşme ve sürdürülebilirlik günümüz dünyasında artık tartışmalı konular değildir. Dijital inovasyon ve çevreye ilişkin eylemler sürekli gelişmekte ve bir şirketin stratejisini, yapısını, operasyonlarını ve performansını etkilemektedir. Özellikle Türkiye gibi gelişmekte olan bir ekonomi için bu gelişmeler oldukça önemlidir. İstihdamın %72'sini sağlayan küçük ve orta ölçekli işletmeler (KOBİ'ler) Türkiye ekonomisinin bel kemiğini oluşturmaktadır. Günümüz iş dünyasında dijital inovasyon ve sürdürülebilirlik yaklaşımlarının kullanılması, KOBİ'lerin büyümesi üzerinde giderek daha olumlu bir etkiye sahip olmaktadır. Bu makale, Türk KOBİ'lerinin sürdürülebilirlik ve dijitalleşmeye yönelik dönüşüm sürecine odaklanmaktadır. Veriler, 27 AB ülkesinin ortalamasını Türkiye ile karşılaştıran Flaş Avrupa Barometresi 486'dan elde edilmiştir. Çalışmanın sonucunda özellikle yüksek yatırım gereksinimleri ve finansal kaynakların kıtlığı nedeniyle sürdürülebilirlik ve dijitalleşme uygulamalarının Türk KOBİ'leri tarafından yeterince hayata geçirilemediği anlaşılmıştır.

Anahtar Kelimeler: *Dijitalleşme, Sürdürülebilirlik, Dönüşüm, KOBİ, Türkiye*
JEL Sınıflandırması: *M10, M11, M13, M14, M15, M19*

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1. Introduction

Digitalization and sustainability are requirements in today's world, an "industry standard" that every company must adhere to. It is no longer "just" for competitive advantage but for businesses to "simply" survive (Ogrean and Herciu, 2021: 290). Technologies, methods, and environmentally friendly strategies depend upon the firm's national environmentalism, ecological perception, and competitive advantages (Pekanov Starčević et al., 2017: 143). Intense competition and increased energy costs have accelerated the implementation of green processes (Kabiraj et al., 2010: 26). Environmentally friendly products have lower production costs due to more efficient energy utilization (Olson, 2013: 173). Ecological concerns affect the costs and revenue of a firm and thus affect its business outcomes (Schaltegger and Synnestvedt, 2002: 339; Molina-Azorin et al., 2009: 1083). Steps toward increased ecological friendliness are vital for firms since their business relies on effectively utilizing technological innovations and resources (Pekanov Starčević et al., 2017: 143). To establish green growth, it is necessary to invest in new green products (Kunapatarawong and Martínez-Ros, 2016: 1227; Fernando et al., 2019: 8).

Since the 1960s, the role of corporations in environmental preservation has gotten more emphasis (Van Marrewijk, 2003: 96; Hoffman and Bansal, 2012: 2; Hoogendoorn, 2015: 759). Most large organizations have already adjusted their production to greener practices. Yet, many small and medium-sized enterprises (SMEs) are still paving the way to becoming green firm (Pekanov Starčević et al., 2017: 142). Despite research examining the role of large companies in addressing environmental concerns, the role of SMEs remains largely unexplored (Aragón-Correa et al., 2008: 88; Pacheco et al., 2010: 465; Russo and Minto, 2012: 16; Hoffman and Bansal, 2012: 18). As long as sustainability remains a constant objective and a growing issue for businesses, a variety of stakeholders concerned with either the environmental or social dimensions of sustainability monitor them closely (Ardia et al., 2020: 1; Calderon-Monge et al., 2021: 74).

Besides sustainability, the Fourth Industrial Revolution is influencing the existence of SMEs. The most notable element of the Fourth Industrial Revolution is digitalization (Schwab, 2017: 12; Rachinger et al., 2019: 1145; Rivza et al., 2019: 262; Yuan et al., 2021: 2). Digitalization is a rising trend that has an impact on an organization's strategy, structure, and procedures, as well as the ability to improve its performance (Truant et al., 2021: 1). There is widespread agreement that the digital innovation transition will radically change how people live, society's function, and businesses run (World Economic Forum, 2018).

In the framework of firm organizations, "digitalization" refers to the application of digital innovation to alter a firm's business operations and open up chances for value creation, thereby revolutionizing the way a business performs (Cenamor et al., 2017: 55; Porter and Heppelmann, 2015: 96-114; Truant et al., 2021: 1). The implications of digitalization may have a greater impact on firms' prospects than any previous technological advancement. Finding an acceptable strategy response to such a profound technological transformation is a critical issue for any company (Hossnofsky and Junge, 2019: 966).

Numerous firms are being pushed to adopt new business approaches built on digital equipment to expand their chances and advantages (Baines et al., 2017: 269; Bresciani et al., 2018: 331). In contrast, some corporations are unaware of the effect of digitalization on performance and thus spend money on information technologies without a well-thought-out plan (Truant et al., 2021: 1). In particular, SMEs lag behind in digital conversion in emerging countries such as Türkiye (OECD, 2021: 21). The actions and barriers of digitalization and sustainability and their influence on SMEs are key research questions for scientists to consider.

This paper focuses on the transformational process toward sustainability and digitalization of Turkish SMEs. The European Union (EU) defines medium-sized enterprises as companies with fewer than 250 employees and sales below 50 million EUR, and small enterprises as businesses with fewer than 50 employees and sales below 10 million EUR (OECD, 2018: 18). SMEs account for

more than 99 percent of all businesses in the EU and Türkiye. In the EU and Türkiye, SMEs employ approximately two out of every three people and generate more than half of all value-added, making them vital to the transformational processes towards digitalization and the sustainability of Turkish SMEs. The COVID-19 epidemic has considerably impacted small and medium-sized firms (SMEs) in Türkiye. Except for information and communication, which increased by 0.8%, other sectors declined in SME value-added. Value-added fell by 10% in the wholesale and retail trade sectors and by 9.1% in the lodging and food services sectors. SME value added in the manufacturing sector fell by 6.3 percent. In 2019, SMEs in Türkiye contributed 52.6 percent of the total value added in Türkiye's "non-financial business sector," slightly less than the EU average of 53.2 percent.

Furthermore, Turkish SMEs employment was 73.5 percent of overall employment, much more than the EU average of 65 percent. However, as measured by value-added per person employed, SME productivity was roughly EUR 10 100, less than a fifth of the EU average of EUR 42 600 (European Commission, 2021a). Therefore, the transformational process toward digitalization and sustainability is a crucial opportunity for Turkish SMEs to grow.

In this context, the primary concerns addressed in this study are:

- How are Turkish SMEs prepared for the shift towards digitalization and sustainability?
- How do Turkish SMEs approach and perform in terms of digitalization and sustainability in comparison to the average performance of SMEs in the EU-27?
- How to accelerate the shift for SMEs in Türkiye?

The data used in the study are primarily drawn from the Flash Eurobarometer 486 survey on SMEs, start-ups, scale-ups, and entrepreneurship, issued in September 2020 (Eurobarometer, 2020). The paper will examine and discuss the data from the Eurobarometer 486 survey on the two topics to classify the differences between Turkish SMEs and EU-27 SMEs related to the awareness, approaches, and actions associated with sustainability and digitalization; realize the chances and difficulties that Turkish SMEs face in the shift; and offer some advice to help Turkish SMEs accelerate the direction towards sustainability and digitalization. This research discovered that sustainability and digital technologies remain underutilized in Turkish SMEs, mainly owing to high investment needs and a lack of financial resources. This study adds to the body of knowledge on Turkish SMEs' adoption patterns and challenges to sustainability and digital innovations, as well as pointing to future research directions and providing numerous stimulants for researchers. These results may help managers and practitioners understand the current status of Turkish SMEs.

The rest of this work is organized in the following manner: Section 2 contains analysis and research findings. Section 3 discusses the study findings, their contributions, and their future implications.

2. Theoretical Background

2.1. Digitalization

The term "digitalization" is used to describe how business models are changing as a result of fundamental adjustments made to client interfaces, and services, and products, as well as the usage of communications and information technologies. Digitalization is referred to as an enabler of ecologically sustainable growth due to its transformative capacity (Isensee et al., 2020: 2). Although the terms "digitization," "digitalization," and "DX" are sometimes used interchangeably, it is crucial that all parties involved comprehend the various definitions. The process begins with digitization (the change of analog to digital), which then makes possible digitalization, which eventually results in digital transformation (DX) (European Commission, 2021b: 64).

Digitalization uses technology to alter an institution's business model and create new revenue and value-generating possibilities. Digitalization may be described as a transition to a digital company (Gray and Rumpe, 2015: 1319). Digitalization is one of the significant developments that

will affect society and enterprises in the near and far future. Almost every sector has to adapt "digitally" in the era of Industry 4.0, often known as the fourth industrial revolution (Verina and Titko, 2019: 720). Digital technologies have greater potential as a value-creating approach that increases and maintains a company's market strength. As a result, digitalization facilitates long-term growth (Voza et al., 2022: 17). In other words, it is the corporation's reorganization to take advantage of digital technology's new possibilities and demands (Gobble, 2018: 56–57). Digitalization is a process that teaches companies what to acquire and sell, how to market, how to create and transport goods effectively, and how to interact with customers (Sarıkaya, 2022: 8). Sensor technology advancements, production machine connections, edge computing, data storage, authentication and encryption have all established the technical groundwork for industrial digitalization (Voza et al., 2022: 17). For example, digitalization in the production department comprises digitally designing items, generating, and testing components electronically before manufacturing the product, and maintaining a healthy connection between the product, its consumers, and the manufacturing organization (Gray and Rumpe, 2015: 1320).

To realize customer focus and operating benefits, SMEs are tracking digitalization projects to modernize their outdated infrastructure with IIoT-ready systems. This includes implementing certain digital technology in the core production, planning, and design processes (Dutta et al., 2021: 1681-1682). SME's have numerous benefits over larger organizations since they are more flexible, dynamic, collaborative, adaptable, and less bureaucratic. To achieve a successful digital transformation process, they should modify their organizational forms and business-making environmnet beginning from manufacturing technology to management perceptions (Ulas, 2019: 667). On the one hand, SMEs are frequently only partially aware of the impacts of digitalization. As a result, it is difficult to accurately quantify the potential economic benefits of digitalization solutions due to misconceptions about their cost and complexity. However, because SMEs are significantly more cost-sensitive than bigger businesses, inaccurate assessment frequently results in the improper prioritization and selection of execution technologies, endangering the value chain of those companies. Thus, SMEs need a suitable method for measuring the adoption potential and focus on the digital technologies (Kilimis et al., 2019: 2140).

2.2. Sustainability

Sustainability encapsulates the desire to develop a peaceful society with social equality, justice, and economic success in a clean, natural environment (Schaltegger and Burritt, 2005: 186). Sustainability has become a vital tool for many businesses as they look for methods to save costs, manage risks, develop new products, and manage changes in organizational culture and structures (Azapagic, 2003: 303).

The Triple Bottom Line, which gained notoriety in the business world after the publishing of the book Cannibals with Forks: The Triple Bottom Line of 21st Century-Business in 1997, represents the elements of sustainability and is integral to the idea of a sustainable organization. The triple bottom line, that refers to the three facets of sustainability, should be integrated so that, in terms of the environment, natural resources are exploited in a way that doesn't hurt present or future generations, minimizing the effects of industrial activity. From an economic standpoint, it is essential to maintain the company's profitability rather than jeopardizing its ability to grow. The building of a fairer society through partnerships with all stakeholders is the ultimate goal in the social domain, which encompasses the topic of social justice (Gomes et al., 2015: 117).

Economic sustainability is the production of revenue for society's citizens without abusing its resources or capital, which creates a positive feedback loop and stabilizes the economy. The organizations must change their practices toward renewability, reusability, recycling, and life cycle costing as well as incorporate the cost of wastes, emissions, and pollutions, among other things, into the costing system in order to have this circular effect that stabilizes both the economy and society (Rai et al., 2021: 12009). The following factors must be taken into account while managing economic sustainability: A company's financial performance, its management of intangible assets,

its impact on the overall economy, and its management of social and environmental repercussions (Doane and MacGillivray, 2001).

Environmental sustainability encompasses replenishing resources, reducing pollutant generation, and removing actions harmful to the environment (Kumbalı et al., 2022: 793). The emphasis is on the capability of the natural ecosystem necessary for human life and the harmful consequences of industrial activities on the natural ecosystem (Sheehy and Farneti, 2021: 7). The premise behind environmental sustainability is that humankind has reached its physical and biological limitations. It is connected to the organization's environmental impact and mitigation capability (Saunila et al., 2019: 179). The capacity to retain the quality and repeatability of natural resources over the long term is characterized as environmental sustainability, which efforts to improve human well-being by safeguarding natural resources (Matteis et al., 2017: 8).

While environmental sustainability focuses on natural resource management, social sustainability conserves and develops social resources such as people's talents and skills, relationships, and social values. The most general challenges addressed in the social sustainability framework are boosting health and education standards, safeguarding cultural variety, and promoting social justice (Sarkis et al., 2010: 338-339). The social sustainability factor is centered on social capital. However, it may also take the form of a social dimension. It is about the capacity to improve the health, safety, and well-being of stakeholders, particularly workers, and to increase the well-being of local communities (Saunila et al., 2019: 179). According to Starik and Rands (1995), sustainability is the capacity of one or more entities to endure and thrive over the long term, either independently or collaboratively. Examining the social facets of sustainability from the perspectives of both employees and customers is becoming more and more popular. Social sustainability thus embodies workers, clients, and the brand of the company, which may improve organizational performance (Lee et al., 2021: 751).

Businesses should prioritize applying policies and procedures that enhance the economic, social, and environmental circumstances of the environments in which they function, which is something that is being emphasized day by day. Companies are anticipated to achieve long-term sustainability by merging these three factors. Business involves making consistent profits, using resources responsibly and effectively with little to no environmental impact, and enhancing the community in which it operates. However, many firms, even well-established ones, are unable to meet these expectations due to a misalignment between these dimensions and conventional profit-oriented behaviors (Giudice et al., 2017: 1397).

3. Research Framework, Methodology, and Results

Findings from the Eurobarometer 486 data on Turkish SMEs' shift to digitalization and sustainability are presented in this section (Eurobarometer, 2020). The assessed dataset includes 300 Turkish SMEs and 12610 EU SMEs. The questions in Eurobarometer 486 that most explicitly address the digital and sustainability conversion of EU27 SMEs, as well as their respective replies, indicate the strategy used by Turkish SMEs on digitalization and sustainability versus the average approach taken by EU27 SMEs. In the following section, we apply the questions in Eurobarometer 486 that explicitly address the digital and sustainability transitions of EU27 SMEs and Türkiye and their respective replies. The comparison between Türkiye and the EU will reveal the strategy used by Turkish SMEs on digitalization and sustainability.

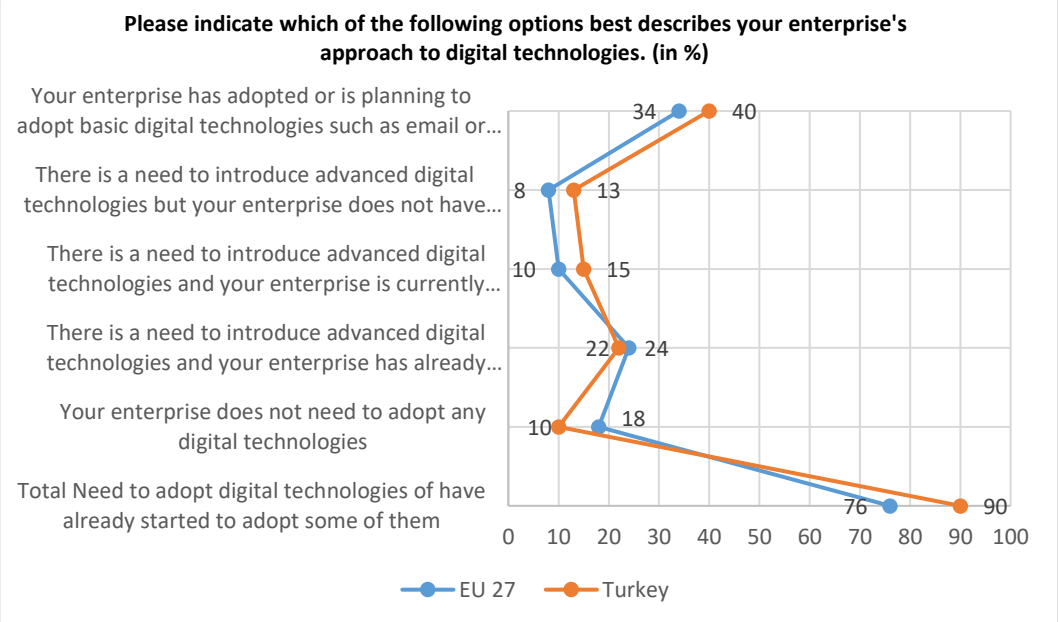
3.1. Turkish SMEs Attitudes Towards Digitalization

In Türkiye, 49% of SMEs have a digitalization plan or strategy, whereas, in the EU, only 21% have plans to digitalize (Eurobarometer, 2020). In this section, we will analyze the proportion of SMEs that have developed a digitalization action plan or strategy and the digital innovation approach adopted by SMEs. The sorts of digital technologies that have been embraced and the impediments to digitalization are examined.

3.1.1 Adoption of Digitalization

a) SMEs Approaches to Digital Innovation: A large number (76%) of SMEs in the EU think they need to use digital technologies or have already started to do so. 90% of Turkish SMEs think they must use or have already implemented specific digital innovations. Almost one-quarter (24%) of EU SME respondents believe there is a pressing need to incorporate new digital technologies, and their company has already begun to use them. Like in the EU, 22% of Turkish SMEs believe that sophisticated digital technologies are necessary and that their firm has already started implementing them. Approximately one in every five SMEs (18%) said their organization does not need to embrace digital innovation. Almost one in ten (10%) Turkish SMEs said they were not required to use any digital innovation. 10% of EU SME owners and managers believe it is necessary to implement sophisticated digital innovations, and their company is presently deciding which ones to implement. Moreover, 8% of SMEs believe there is an urgency to introduce advanced digital technologies, but their company lacks the necessary knowledge, skills, or financial resources to do so. Though 15% of Turkish SMEs report that it is essential to adopt high-tech digital technologies, at present, their firm is deciding which ones to implement, while nearly as many (13% of Turkish SMEs) report that they require advanced digital technologies, but their business lacks the necessary knowledge, skills, or financing to do so. Nearly one-third (34%) though 15% of Turkish SMEs report that it is essential to adopt high-tech digital technologies, at present, their firm is deciding which ones to implement, while nearly as many (13% of Turkish SMEs) report that they require advanced digital technologies, but their business lacks the necessary knowledge, skills, or financing to do so. Nearly one-third (34%) of EU SMEs respondents say their company has embraced or plans to implement elementary digital innovations such as web pages or email providers, but not high-tech digital technologies such as artificial intelligence. This is in contrast to the 40% of Turkish SMEs that say their company has not implemented advanced digital technologies but has implemented or wants to implement simple digital technologies. of EU SMEs, respondents say their company has embraced or plans to implement elementary digital innovations such as web pages or email providers, but not high-tech digital technologies such as artificial intelligence. This is in contrast to the 40% of Turkish SMEs that say their company has not implemented advanced digital technologies but has implemented or wants to implement simple digital technologies. Figure 1 summarize the digitization strategy used by Türkiye.

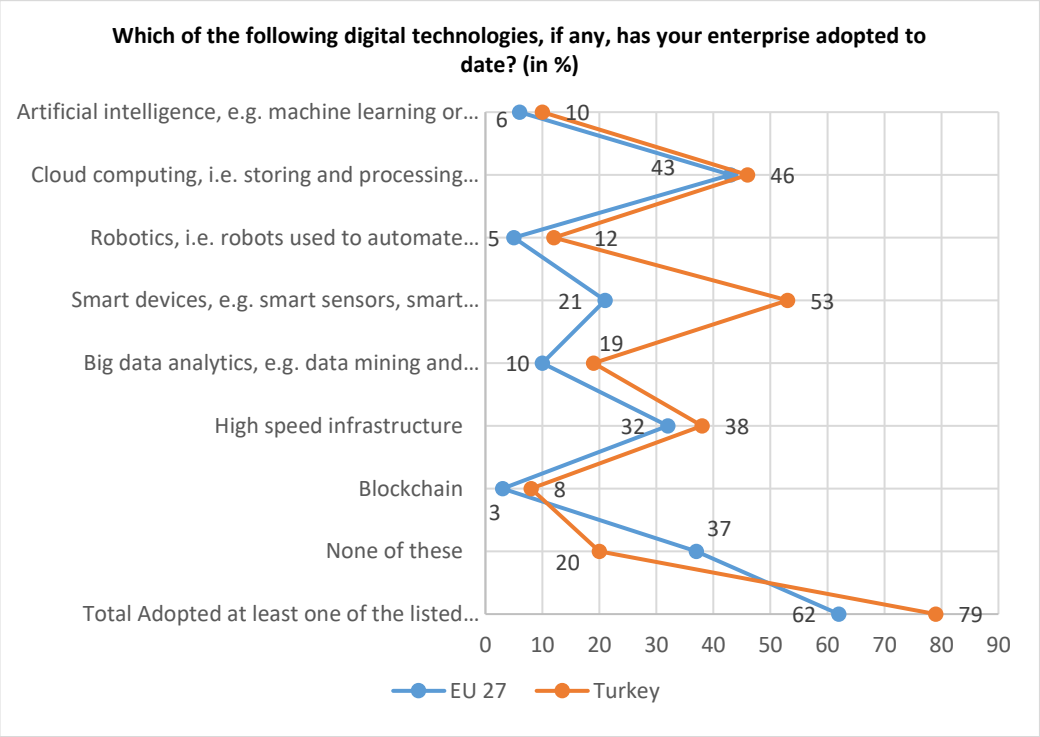
Figure1: **Approach to Digitalization**



Source: Own elaboration according to Eurobarometer (2020)

b) Adoption of High-Tech Digital Technologies: EU SMEs have adopted at least 62% and Turkish SMEs 79% of advanced high-tech technologies. One in every ten EU SMEs (10%) uses big data analytics, with artificial intelligence accounting for 6% (AI). On the other hand, only 19% of SMEs in Türkiye use big data analytics, and only 10% use artificial intelligence (AI). Almost one-third (32%) of EU SMEs use high-speed infrastructure, and 21% have smart devices installed. 38% of Turkish SMEs have high-speed infrastructure, and 53% have smart gadgets. Less than one in every twenty EU SMEs uses robotics (5%) and blockchain technologies (3%). Contrary to expectations, Turkish SMEs use slightly more robots (12%) and blockchain technology (8 %) than their EU counterparts. Figure 2 displays the digital innovations that have been implemented.

Figure 2. **Digital Innovations Adopted**

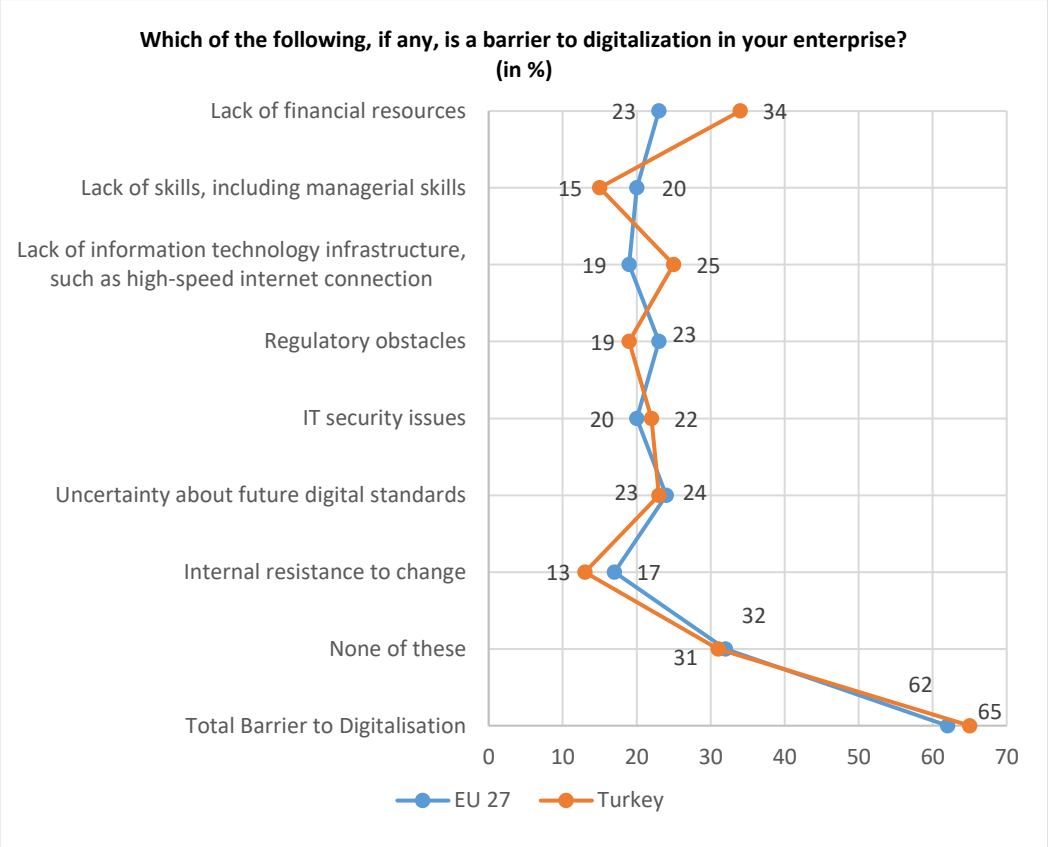


Source: Own elaboration according to Eurobarometer (2020)

3.1.2 Barriers to Digitalization

62% of EU SMEs report encountering at least one of the aforementioned digital innovation obstacles in their firm, while 65% of Turkish SMEs face at least one, as mentioned earlier. Nearly a quarter (24%) of EU SMEs reported insecurity about upcoming digital standards as a hindrance, while 23% cited a lack of fiscal sources or regulatory hurdles (also 23%). Whereas for Turkish SMEs, the lack of financial resources and regulatory impediments are cited as barriers by almost one-quarter (24% and 19%, respectively). Concerns about information technology security and a lack of skills are identified as barriers to digitalization among EU SMEs (20%). Meanwhile, 19% cited an absence of information technology infrastructure as a barrier, and 17% reported internal opposition to shifting as a barrier. One in five (20%) Turkish SMEs communicated IT protection concerns and an absence of expertise as obstacles to digitalization; 19% mentioned an absence of information technology structure; and 17% referred to internal opposition to transformation. Around a third (32%) of EU respondents indicated that none of these barriers to digitalization existed in their organization. Approximately one-third (31%) of Turkish SMEs say nothing impedes digitalization in their organization. Figure 3 illustrates the obstacles hindering the process of digitalization.

Figure 3: **Barriers to Digitalization**



Source: Own elaboration according to Eurobarometer (2020)

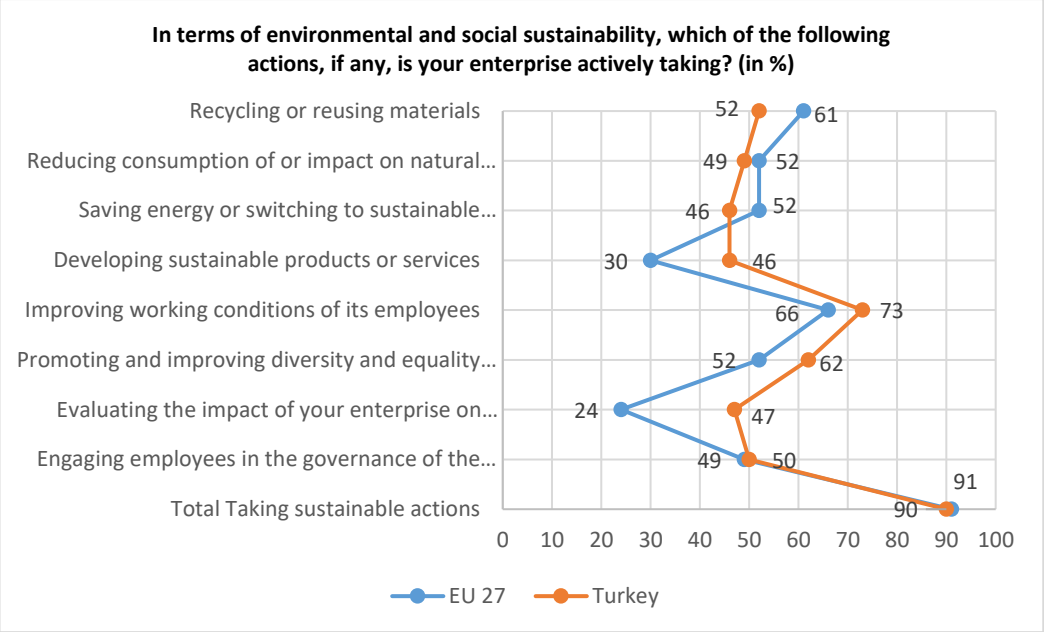
3.2. Turkish SMEs Attitudes Towards Sustainability

This section focuses on Turkish SMEs' sustainability. We look at the percentage of SMEs that have developed a sustainability action or strategy plan, as well as the approach that SMEs have taken to sustainability. Furthermore, the types of sustainability efforts implemented, and the sustainability challenges are studied.

3.2.1 Adoption of Sustainability

a) SMEs Approaches to Sustainability: In EU SMEs, working conditions improve by two-thirds (66%), and resources are recycled or reused by six-tenths (61%). In Türkiye, 73% enhance their workers' working conditions, while 52% recycle or reuse resources. More than half of EU SMEs (52%) mentioned reducing their consumption of natural resources or their environmental footprint, reducing energy use or shifting to sustainable energy resources, and encouraging and enlightening variety and equivalence at work. In comparison, nearly half (49%) say they involve workers in the organization's governance. In contrast, similar to EU results, half (50%) say they support employees in organizational governance. Less than half of Turkish SMEs say they are reducing their usage of or effect on natural sources (49%), conserving energy or converting to sustainable energy resources (46%), or inspiring and enlightening workplace equality and diversity (52%). In the EU, three out of ten companies (30%) produce environmentally friendly goods or services, while 24 percent examine their company's social impact. In Türkiye, 46% of businesses produce sustainable goods or services, while 47% examine their company's social impact. Nine out of ten countries in the EU (90%) and Türkiye (91%) are conducting sustainable activities. Figure 4 shows actions towards achieving sustainability.

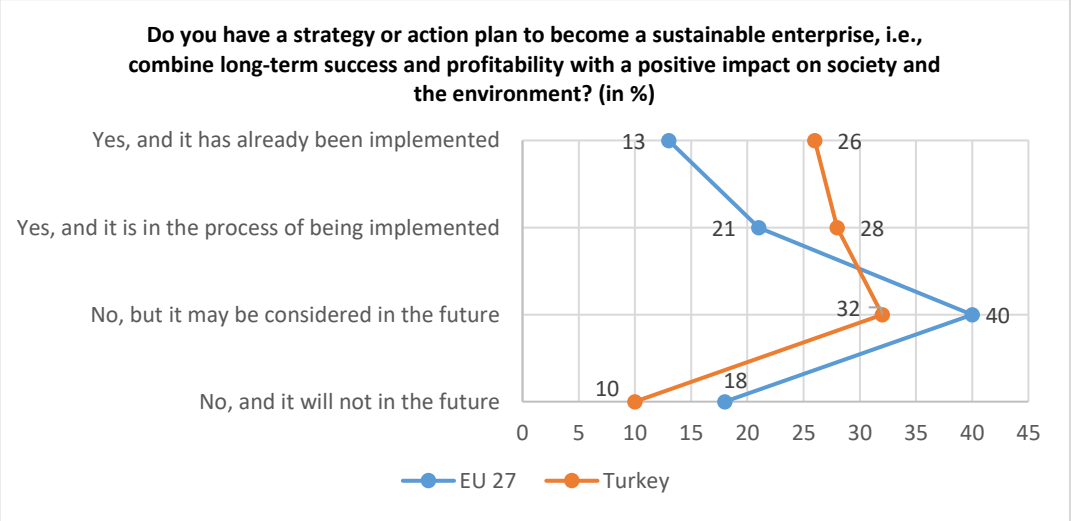
Figure 4: **Sustainability Actions**



Source: Own elaboration according to Eurobarometer (2020)

b) Having a Strategic Action Plan for Sustainability: Approximately 34% of EU SMEs claim to have an approach or activity plan to transform into a sustainable company, with 13% claiming to have one that has already been utilized and another 21% claiming to have one that is in the process of being implemented. 54% of Turkish SMEs report having a plan or action proposal to develop a sustainable firm, with 26% reporting having previously implemented one and 28% reporting that they are implementing one. A plan or approach to becoming a sustainable company is something that four out of ten EU SME businesses (40%) say they may investigate in the upcoming time, while 18% state that they will not have one or do not currently have one in the upcoming time. 32% of Turkish SMEs say they may be concerned about developing an approach or activity plan in the future to grow into a sustainable company, while 10% say they do not have one and will not develop one. Figure 5 illustrates the sustainability action plan.

Figure 5: **Sustainability Action Plan**

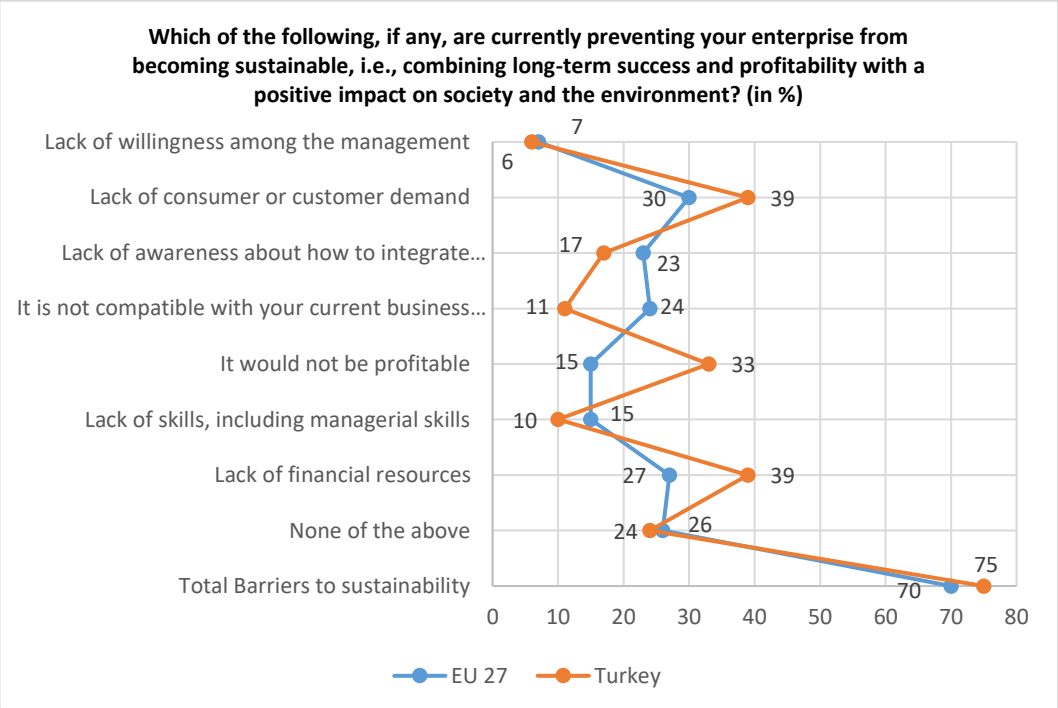


Source: Own elaboration according to Eurobarometer (2020)

3.2.2 Barriers to Sustainability

Consumer or client demand is mentioned by three out of ten EU SME respondents (30%), while a lack of financial resources is cited by 27%. In contrast, almost four out of ten (39%) Turkish SMEs identify an absence of consumer or client demand and a scarcity of financial resources. It is estimated that almost one-quarter (24%) of EU SME respondents believe that developing more sustainably is incompatible with their current business approach or that there is a need to understand what it means to incorporate sustainability into their company strategy (23%). Almost 11% of Turkish SME respondents indicate that being sustainable is incompatible with their existing company model or that they lack an understanding of incorporating sustainability into their business strategy (17%). SME respondents in the EU believe that being sustainable would be unprofitable or lack the necessary capabilities to do so (15%), while 7% believe that an absence of management commitment inhibits their company from developing sustainability activities. In Türkiye, more than three in ten (33%) think that being sustainable would be unprofitable or that they lack the necessary skills (10%), while 6% say a lack of managerial desire is a barrier to becoming sustainable. One-quarter (26%) of EU and Turkish SMEs claim no impediments exist. Seven out of ten see the listed categories as a barrier to sustainability in the EU (70%) and Türkiye (75%). Figure 6 presents obstacles to achieving sustainability.

Figure 6: **Barriers to Sustainability**



Source: Own elaboration according to Eurobarometer (2020)

4. Conclusion

Digitalization is believed to play a significant role in allowing circularity and the shift to additional sustainable behaviors and processes (Berg et al., 2021: 54). Today's businesses operate in distinct economic, environmental, and social contexts. The results of this activity concentrated on profit generation, cost saving, and the creation of added value in another aspect that is increasingly being revealed to benefit the community and society. Digital technologies enable businesspersons to establish new business models and types of fabrication while executing technological, product design, and revenue model innovations lessen the usage of raw materials and reuse more products (Berg et al., 2021: 10; De Man and Strandhagen, 2017: 722). Digital

technologies are critical for the shift to a circular economy in terms of sustainability (Khan et al., 2021: 3). These are the fundamental goals for more effective use of natural resources: guaranteeing more sustainable consumption and manufacture activities, lowering greenhouse gas releases, and preventing natural capital reduction (Voza et al., 2022: 17).

SMEs have less ecological understanding than bigger enterprises and feel that their commercial endeavor has a small environmental effect (Voza et al., 2022: 18). It is sometimes said that SMEs' grasp of ecological sustainability is echoed in their features such as size, turnover, and others. Nevertheless, the profit-oriented factor prevails in such a set of businesses (Battisti and Perry, 2011: 181-182). In terms of environmental aims, digitalization is expected to be a factor of change by reducing resource consumption, carbon emissions, and waste and introducing a variety of other corporate activities that promote green investments and events. It also enables the long-term growth of SMEs by extending the product lifespan therefore adapting the SME business model to environmental demands. Consequently, company direction changes will incorporate sustainable development goals (SDG) into their long-term policy (Voza et al., 2022: 19).

Our findings show that the European Union and Turkish SMEs have different outcomes. The results of the Eurobarometer 486 are likely to reveal a series of insights that Turkish SMEs are facing. These challenges may be related to the belief-perception-attitude mechanisms that lead to decisions and behaviors. Regarding digitalization, 43% (less than half) of Turkish SMEs declared that they have a strategy or plan to digitalize their company. In these situations, the lack of financial resources (placed at the top as an impediment to digitalization) may appear to be the ideal justification for delaying digitalization. Furthermore, some Turkish SMEs may not fully realize and/or acknowledge the extent of their incapacity to manage effectively or their internal resistance to change, both of which were recognized by fewer than one in ten SMEs in Türkiye. At the same time, uncertainty about future digital standards and high-speed internet connections is mentioned as a barrier by most SMEs in Türkiye. This appears to be the case when one considers that less than half of the Turkish SMEs acknowledge the requirement to establish digital technologies or have implemented several of them (compared to three-quarters of the EU's SMEs). About one in five enterprises reports that their enterprise does not require digital technologies, and a quarter struggles to "find" their approach (compared to only 4% of the EU's SMEs). Unfortunately, the small percentage of SMEs in Türkiye researching and/or using current digital innovations only confirms this assumption. 75 percent of Turkish respondents acknowledge that at least one barrier to digitalization remains, compared to the EU's average of 70 percent, which is somewhat encouraging. Compared to the most frequently cited barriers, all other obstacles to sustainability admitted by Turkish SMEs seem entirely irrelevant. However, while the lack of financial resources and consumer or customer demand (each 39%) are the most frequently cited barriers to sustainability in Türkiye, the lack of consumer or customer demand is the most commonly mentioned barrier in EU SMEs. Furthermore, Turkish SMEs are considering the profitability of sustainable actions in their decision-making process. Managerial skills and a need for willingness among the management team, which would make it unprofitable, are deficient. Furthermore, the significant differences in perceptions of obstacles to sustainability related to the enterprises' business model and the focus on profitability as a barrier between Turkish SMEs and the EU's SMEs raise some concerns about both the "clarity" and the "consistency" of Turkish SMEs.

From a research standpoint, this paper contributes to the body of knowledge by elaborating on the attitude of Turkish SMEs toward digitalization and sustainability. The investigation deepens our knowledge of the activities and challenges that impede Turkish SMEs' adoption of digital innovations and sustainability. In terms of removing obstacles to digitalization and sustainability, the findings show a need for a change to the current regulatory framework, namely through boosting financial access to make sustainability and digitalization investments simpler. Uncertainties, such as financial constraints and environmental stewardship, might influence a business's choice to adopt new digital and sustainable practices. Business managers should focus on the new possibilities of accessing financial resources to finance their attempts to adopt digital

and sustainability practices. Furthermore, Turkish SME managers can focus on combining digital innovation with sustainability actions. They can focus on "sustainable digitalization" and "digital sustainability" of products or services, processes, or business models, which leads to new and innovative business ideas.

However, our analysis has several substantial limitations. First, we did not make a differentiation regarding the SME sectors. Some sectors may be keen on sustainability and digitalization. Therefore, future studies should focus on single sectors. Second, our research compares a single nation with a group of countries. This comparison may not reflect Türkiye's present situation accurately since we used the average of 27 EU member states. This is significant because some organizational elements, such as digital and greening initiatives, may require different decision-making processes in different countries. To address this issue, we propose that future research collect time-series and cross-sectional data from the same organization. Future research might also further examine the significance of the correlations outlined in this paper using long-term data on Turkish SMEs' digital and sustainability activities.

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