TECHNOLOGY ADOPTION AMONG FEMALE OWNED SMES IN TURKEY

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Abstract

This study aims to explore the technology adoption among female SME owners in Turkey, utilizing the Individual Differences Theory (IDT) as the main theoretical framework. Adapting IDT, was originally developed for women working in IT sectors to the entrepreneurships context expanded the theory to include unique experiences of women entrepreneurs in technology adoption. Understanding these individual identity, individual influence and environmental factors shaping the technology adoption of female SME owners will contribute to existing policies and support programs regarding female entrepreneurs. 19 semi-structured interviews were conducted with 12 female SME owners and 7 experts. Using a combination of inductive and deductive methods, a thematic analysis was carried out to uncover the common themes and characteristics of female SME owners, as well as environmental factors affecting their technology adoption. The analysis shows that women can react differently to similar factors. They can overcome factors such as age and socio-economic background through characteristics like resilience and confidence. However, all participants are dependent on factors such as family support and financial resources. Also, the analysis showed that women value technologies that would serve society. Policy-makers should take these unique characteristics of women into account and follow strategies to reposition them as their strengths. This way women can be pioneers in areas such as green transition and waste utilization. Also, end to end support with an aim to fix the problems within the entrepreneurship system as a whole should be prioritised over positive discrimination, which should be directed to rural areas with deeper issues.

Contents

Introduction

In the past years, the number of women who run their own companies increased all around the world, narrowing the gap between the number of SMEs owned by women and men (Ughetto et al., 2020) primarily due to the shift from manufacture-focused, traditional economy dominated by man towards retail and service centred economy where higher number of females participate (MacGregor & Vrazalic, 2008). However, although smaller, the gap still exists and is bigger than the gap in the labour market in general (Ughetto et al., 2020).

Literature on women's entrepreneurship suggests that women face unique challenges in starting and growing a business (Tan,2008). Especially in countries where the gender divide is substantial, such as Turkey, women's entrepreneurship is critical since it has the potential to increase women's participation in the labour market (Colombelli et al., 2019). Female entrepreneurs supported with the correct strategies can create a significant potential for the economy in Turkey (Atalay & Varol, 2016) and help women gain economic independence and improve their quality of life, contributing to gender equality (Ecevit Sati & Oktay Yilmaz, 2020).

Technology adoption, known to be imbalanced between male and female entrepreneurs, deserves to be the focus of research because it is essential for the success of an SME. Alam et al. (2022) suggest that SMEs with better technology engagement make double income compared to SMEs with low engagement. Research shows that gender influences the rate of adoption of technology among SMEs, and men are more likely to invest in technology as compared to women (Alam et al., 2022; Ecevit Sati & Oktay Yilmaz, 2020; Expósito et al., 2022; Ibrahim, 2018; MacGregor & Vrazalic, 2008; Orser & Riding, 2018 2020; Turhan, 2023). Also, gender-specific obstacles are more often faced by SMEs owned and managed by women (Brush et al., 2002). If left unaddressed, the rapid expansion of digital technologies can deepen the gap because they disrupt the ways business is done, leading to higher gender inequality (Alam et al., 2022).

Adapting Individual Differences Theory (IDT), initially developed for women working in IT sectors to the context of entrepreneurship, expanded the theory to include the unique experiences of women entrepreneurs in technology adoption. Since owners are the decision-makers in SMEs, and these decisions are influenced by their characteristics,

applying the theory to this group seemed promising. The strength of this theory is that it treats women as individuals rather than as a homogeneous group, and it is expected that the theory can be improved by applying it to female SME owners, revealing their unique features and challenges they encounter.

Existing research on technology adoption, particularly in the SME context, is limited, and there is a gap in the literature regarding the ways gender influences technology adoption (Alam et al., 2022; Bayrakçı & Köse, 2019; Expósito et al., 2022; Muştu, 2023; Orser & Riding, 2018). This is mainly because existing research on entrepreneurship focuses on men and assumes that women operate in traditional sectors that are not technology-intensive (Atalay & Varol, 2016).

Most of the related research has been carried out using questionnaires and quantitative techniques regarding large companies (Orser & Riding, 2018). In the context of Turkey, especially qualitative research that would allow women to talk freely about their experiences is scarce, and the existing research is limited in scope, such as focusing on a particular sector or province. With the existing efforts of governments worldwide, including Turkey, to improve entrepreneurship as a means for economic development and growth, factors shaping the experiences of an underprivileged group can guide the policy actions undertaken.

Current SME support programmes in Turkey do not consider female entrepreneurs' specific needs, depriving female SME owners of the customised support they need. SME support in Turkey is mainly provided by KOSGEB (Small and Medium Industry Development Organization) under various support programs in areas such as green transition and energy efficiency. However, no tailored programme is offered to increase the integration of female entrepreneurs into the entrepreneurship ecosystem. The IDT that allows individual-level analysis will help discover the unique traits of women entrepreneurs that should be used to empower them and provide guidance to the institutions that design SME support programs.

This study aims to contribute to narrowing the gender divide by exploring the factors relevant to the technology adoption among female entrepreneurs in Turkey. By examining these factors across various sectors and regions, the study seeks to provide valuable insights for policymakers. The main research question guiding this study is:

- How do individual identity, individual influence, and environmental factors shape the experiences of female SME owners in Turkey regarding technology adoption?

And following sub questions:

- o Which individual identity factors (personal demographic features such as age, socio-economic class) are relevant in shaping female SME owner's experiences in technology adoption in Turkey?

- o Which individual influence factors (personal characteristics such as education, character, and skills and personal influences such as mentors, role models) are relevant in shaping female SME owner's experiences in technology adoption in Turkey?

- o Which environmental factors (cultural attitudes and values, economic and political factors) are relevant in shaping female SME owner's experiences in technology adoption in Turkey?

- o How can the Turkish government improve their support programs regarding technology adoption of female SME owners?

The structure of the thesis is as follows. First, the theoretical framework section will cover the literature review of the existing research and a discussion of the theories and concepts on which the study is built. Then, the methodology section will present the research design, data collection, operationalisation and method of analysis. The findings section will disclose the results of the analysis, including the quotes from participants, and in the discussion chapter, these findings will be summarized and discussed, whereas limitations and potential future research areas will be mentioned. The conclusion chapter finalizes the study, highlighting the main outcomes.

Theoretical framework

Literature on women and technology

The empirical studies found several individual and environmental reasons that lead to lower technology adoption in female-owned SMEs. At the individual level, risk aversion is one of the most discussed characteristics that affect the adoption of new technology. According to Expósito et al. (2022) and Hisrich and Brush (1987), since males mostly show higher risk tolerance levels than females, this is reflected in their technology adoption initiatives.

SME owners may perceive technology as both an opportunity and a threat (Alam et al., 2022). Isolation, lack of mentors, lack of access to networks, and lack of awareness of the value of technology for growth (Orser & Riding, 2018) are reasons women may be more

inclined to perceive technology as a threat. Stereotypes that women are not as technically competent, conflicting roles of entrepreneurship and motherhood, the perceived value of technology, the language used to describe technology, the knowledge gap, perceived capabilities, and confidence and comfort with technology are some of the factors affecting women entrepreneurs' technology adoption (Expósito et al., 2022; Gupta et al., 2009; Orser & Riding, 2018). According to Ibrahim (2018), age is a moderating factor, and younger entrepreneurs may be more prone to adopting technology. (Expósito et al., 2022, Orser et. al., 2019).

MacGregor and Vrazalic (2008) suggest that organisational fit is the primary concern for men, while female SME owners are more concerned with technical issues. The literature mentions the concept of ease of use, which means women tend to decide whether to adopt a new technology based on their perception of its complexity and difficulty (Expósito et al., 2022).

According to Orser and Riding (2018), women often do not know the available technological products, where to look for information, and what to ask, which increases their dependency on others for information and makes networks a critical resource for women. However, MacGregor and Vrazalic (2008) claim women are not easily accepted in networks, and according to Orser & Riding (2018), this is because of the prejudice that women are not as technically competent, which also affects their confidence and comfort. Also, even when they are accepted to the networks or establish their own, there is a concern that women tend to talk about personal issues instead of professional and technical topics (Orser et al., 2019).

Domestic responsibilities that lead to different priorities for men and women is a bigger issue in countries like Turkey, where a more traditional male-female role in society is widely accepted. Literature on women's employment suggests that the most prominent reason for the low participation of Turkish women in the workforce is domestic responsibilities such as cleaning and childcare that are attributed to women by societal norms (Ecevit Sati & Oktay Yilmaz, 2020; Atalay & Varol, 2016).

Research on the digital divide in developing countries suggests that digitalisation is occurring unevenly; women are at a disadvantage due to rooted socio-cultural attitudes about the role of women in society (Antonio & Tuffley, 2014). This, combined with most women working in service and agriculture sectors that digitalisation is bypassing, poses the risk of deepening the gender digital divide (Ecevit Sati & Oktay Yilmaz, 2020). Also, the jobs that

require fewer skills that are occupied mainly by women will more likely to disappear and the demand for jobs that require analytic skills will increase, worsening the already disadvantaged situation of women (Ecevit Sati & Oktay Yilmaz, 2020; Gaweł & Mińska-Struzik, 2023) which makes closing the gender gap in technology even more critical.

In addition, the perception of gender-based division of jobs, which is common in developing countries, causes women to choose occupations that are categorized as "appropriate for women", such as nurse, dietitian, teacher, and psychologist, while engineering, pilot, technician positions are occupied mainly by man (Ecevit Sati & Oktay Yilmaz, 2020). This goes back to the education preferences of men and women, where men tend to focus on technical areas so they have the knowledge and skills necessary for technology adoption. In contrast, women mostly prefer non-technical areas, leading to a disadvantaged position regarding technology-related decisions (Expósito et al., 2022). This leads to gender digital divide, defined by Alam et al. (2022) as the uneven access to technology among men and women in many areas, such as social, cultural, political and economic.

Access to finance is also a significant problem, affecting technology investments of female entrepreneurs Research suggests that women report more problems in accessing finance (Expósito et al., 2022; Orser et al., 2019; MacGregor & Vrazalic, 2008). One of the most prominent issues of female entrepreneurs in Turkey is also access to finance, as discovered by previous research (Özkaya, 2009; Solmaz & Özdemir, 2021; Turhan, 2023; Atalay & Varol, 2016), causing most women to use proprietary capital while starting their businesses, making them dependent on family and friends, making government support even more important for women than men.

Governments worldwide are introducing policies and implementing programs to increase technology adoption among SMEs. However, research suggests that these programs do not take gender differences into account and are biased in a way to favour men in terms of eligibility, assessment processes, and funding preferences, deepening the existing inequality between male and female entrepreneurs. On the other hand, the separate programs for women are criticized for diverting attention from efforts to make the general business ecosystem more inclusive (Orser et al., 2019).

Studies on women entrepreneurs in Turkey mainly focus on the general problems they experience in entrepreneurship. Few studies, such as Turhan (2023), investigate women

entrepreneurs' views on digitalization in entrepreneurship and how they implement it. However, the sample was limited to a single rural province and women operating in the service sector. This study includes SME owners from different regions of the country and different sectors to provide a more comprehensive view of the situation. It includes experts to obtain an external perspective. Additionally, implementing IDT in the context of entrepreneurship can reveal unique traits of female entrepreneurs. This approach provides a deeper understanding of the differences and similarities among women, rather than simply comparing them to men, which can guide policymakers in offering strategically targeted support.

The following section discusses different theories on women's technology adoption, including essentialist versus social constructivist approaches. Individual differences and role congruity theories are also discussed as the main framework of this study.

Different approaches to women's technology adoption

Literature about the underrepresentation of women in technology is divided between an essentialist or a social constructivist approach (Joshi et al., 2024; Trauth, 2002; Trauth & Connolly, 2021; Trauth et al., 2004). The basis for the essentialist perspective is the assumption that inherent differences based on biology or psychology exist between men and women. The approach uses inherent differences to explain the perception that technology is a male domain and the differences between male and female relationships with technology (Trauth & Connolly, 2021).

On the other hand, the social construction perspective claims that the mismatch between female identity and technology is constructed and enforced by society. This approach also claims that technology is a male domain, but the reasons behind it lie in the interactions within society instead of biology or psychology (Trauth, 2002; Trauth & Connolly, 2021; Trauth et al., 2004).

One important theory that combines both approaches is the structuration theory by Giddens (1984). Structuration theory suggests structure and agency are a mutually constitutive duality, refusing approaches that see social phenomena determined by social structures or autonomous agents (Jones & Karsten, 2008). Although the theory was not initially developed for ICT, it attracted great interest from researchers in this area. Later, Orlikowski (1992) developed a theory that integrates the views of technology as an objective force and a socially constructed product. She suggests that technology is a byproduct of

human activity, yet it also has inherent characteristics and agency and structure are not independent concepts. IDT, a specific approach developed for the IT field, which will be discussed in the following section also comes from a similar understanding and emphasises individual characteristics and their interactions with contextual factors.

The Individual Differences Theory

The individual differences theory (IDT) (Trauth, 2002) was developed as a middle ground between the essentialist and social constructivist approaches to the relationship between women and technology. IDT criticizes both approaches for their acceptance of gender and technology as fixed and analysis of gender at the group level.

IDT accepts individual differences among women in their approach to technology but claims that it results from a mixture of individual features and sociocultural effects. Although rejecting the essentialist approach, IDT accepts that the relationship between gender and technology is socially constructed on the individual level while focusing on the influence of sociocultural understanding of technology, societal institutions and power dynamics. The theory focuses on diverse sociocultural factors that affect women's attitude towards technology and their responses to these factors (Joshi et al., 2024; Trauth, 2002; Trauth & Connolly, 2021; Trauth et al., 2004). Other studies, such as Orser et al. (2019) and Orser and Riding (2018) also categorized individual-level, firm-level, and societal influences in technology adoption by female entrepreneurs, but they did not consider the interaction between them.

The theory consists of 3 themes that explain the differences between men and women in terms of their relationship with technology, and societal messages about women and men in this domain (Joshi et al., 2024).

- Individual identity factors consist of personal demographic features such as age, race, ethnicity, nationality, socio-economic class, and motherhood status and career features such as sector and type of technology. These lead to variations in the effect of gender discourses and biases.
- Individual influence factors incorporate the effect of personal characteristics such as education, character, and skills, along with personal influences such as role models, experiences with computing, and other significant life experiences

- Environmental factors include contextual factors, institutions and organizations, cultural attitudes and values related to where one lives and economic and political factors in that region/country.

The main purpose of this theory is to explain why some women are successful in technology-related areas and others are not. According to IDT, within gender-group differences arise because the group-level influence of environmental factors can be either strengthened or alleviated by one's identity and individual influences. According to Trauth and Quesenberry (2006), this is due to differential exposure to gender discourse, differential experience of gender discourses and differential response to them.

IDT claims that focusing only on psychological explanations for observed differences between men and women without considering the potential influence of context is problematic and leans towards a determinist stance (Trauth et al., 2004). The gender-technology relationship cannot be explained only by focusing on psychology without paying attention to contextual factors. IDT looks at the joint impacts of endogenous and exogenous factors on individuals' personal development and technology-related decisions (Joshi et al., 2024).

Role Congruity Theory

Role congruity theory (RCT) combines psychology and sociology and suggests that people choose jobs in order to achieve important life goals, and broader gender roles in a society shape these goals (Diekman et al., 2010). As a result, women value communal goals, including interaction, belonging, and altruism, whereas men value agentic goals, focusing more on money, power and personal achievement (Harmon & Walden, 2021). Diekman et al. (2010) claim that, there is a perception that STEM careers are less likely than careers in other arenas to achieve common goals. The scarcity of women in this field also affects technology literacy rates (White, 2014), potentially impacting women's technology adoption and the type of technologies they use.

This study will mainly build upon IDT to understand the factors affecting female SME owners' adoption of technology in Turkey. RCT is also included in the study to highlight broader societal issues because this study aims to inform policymakers to follow strategies to challenge traditional gender roles. While IDT helps to identify the individual factors influencing technology adoption, RCT helps to understand how societal expectations and gender roles impact these factors. By including RCT, this study highlights how societal

norms and gender stereotypes intersect with individual characteristics to influence technology adoption.

Methodology

Research design

Since IDT emphasizes the importance of context and interaction of exogenous and endogenous factors in shaping women's experiences with technology (Trauth & Connolly, 2021), the qualitative approach appears as the most suitable design for this study since it allows to understand the experiences and perceptions of female SME owners in different contexts. Qualitative research allows the researcher to understand how people feel or perceive the subject of focus (Creswell & Creswell Báez, 2020). This approach fits best with the theoretical approach since the majority of existing quantitative research bases its assumptions on women as a group, and this study aims to discover their differences. The semi-structured interviews would allow to explore various individual and societal factors shaping the technology adoption processes of female SME owners that the researcher may not have prior knowledge about.

Understanding the links and underlying factors in technology - gender relationship would be possible through exploratory research to understand how, why and what. As Trauth, (2002, p. 104) noted; "Statistics tell one story; this research tells the story behind that story". Also, qualitative research allows for a deep and more open understanding of complex phenomena (Malhotra & Birks, 2006).

Primary data approach was followed, which means the data was collected via interviews tailored for this research. The interview guide was prepared with the aim of guiding the interviewees in order to gather comparable sorts of information (Kallio et al., 2016), but it was not strictly followed to allow room for participants to provide whatever they think is important for them.

Data collection and sampling

To understand the perceptions and experiences of female SME owners in technology adoption, 19 semi-structured interviews with experts and female SME owners were conducted. Semi-structured interviews allow for additional, potentially relevant information to arise while exploring female SME owners' experiences (Bryman, 2016). 12 female SME owners and 7 experts working in institutions and projects involving female SME owners were interviewed. 1 SME owner is also a university professor with mentoring experience, so she is

included in both groups. Most SME owners were from urban areas, and the participants ranged from 32 to 59 years old. The main age group of the sample falls between the ages of 40 and 50, indicating considerable life and professional experience. The SME owners were interviewed to collect data on their first-hand experience and points of view regarding technology adoption. Including experts' perspectives contributes a great deal, as their views are formed by comparing women entrepreneurs from different sectors and regions, which also serves as compensation for the sectors and regions that could not be included in the study.

Both purposeful and snowball sampling were employed to obtain the sample of female SME owners and experts, Using personal connections with several project managers from different government institutions, the SME owners who participated in several support programs were approached. Following Patton (2002), this approach was followed to collect rich and deep information from participants with some support program experience. Mentors and experts who provide training, on-the-job support, and consultancy to SMEs who may have a good insight into the problems of female SME owners were also contacted via personal connections. The project managers asked the participants if they were interested in the study; the ones who volunteered and gave permission to be contacted were sent an email with detailed information on the study and its aims.

The purpose was to obtain a sample that reflects the common problems of SME owners from different sectors and sizes. However, the majority of the participants who volunteered to participate in the study turned out to be from the food sector. This is a reflection of the current sectoral dispersion of female SME owners and also because of the projects through which they were approached. However, since a sectoral focus was not desired, the snowball sampling method was used with the experts interviewed, asking them if they knew female SME owners outside the food sector.

The final sample included 12 SME owners: 6 from the food sector, 2 from the textile sector, 1 from the restaurant sector, 2 from the communication sector and 1 from the beauty sector. The experts were composed of 5 women and 2 men, with experiences from female SME owners from different sectors.

Procedure

The following procedure was followed during the research: Emails including short but understandable information about the study were sent to the potential participants, and online

meetings were planned due to logistical circumstances. The interviews were conducted in Turkish to allow participants to be more comfortable and share their experiences without worrying about speaking a second language. The interviews were analysed in their original language to avoid missing meanings in translation. Two different interview guides were used for SME owners and experts, focusing on the same topics. The interview guide includes 24 questions for SME owners and 12 for mentors. As Kallio et al. (2016) suggest, the interview guide was not followed strictly, and the participants were allowed to speak on issues that were important to them.

Per the ethical considerations of research, each participant was sent a copy of the informed consent form. All participants' verbal and written consent was received for recording, and they were informed that their privacy would be protected during and after the study. They were also informed that they do not have to respond to any question they do not want to and that they can leave the interview if they are not comfortable.

The interviews were conducted online using Microsoft Teams since the participants and the researcher live in different countries. Each interview was scheduled at a time convenient for the interviewees and lasted 60 minutes on average.

Operationalisation

The first thing to consider is that the data is limited to the perceptions and experiences of the participants. Although the researcher did her best to ensure a diverse sample in terms of age, sector and region, the findings still reflect the unique experiences and observations of the participants. Since the main purpose of qualitative research is not to generalize and the purpose of IDT is to make an analysis at the individual level, this is not considered a problem but is still mentioned to remind the reader.

The individual identity, influence and environmental factors were coded if they were mentioned in relation to technology adoption. Some of them are explained below:

Under individual identity factors, family support includes statements about a supportive husband regarding their work, childcare assistance, and financial support from their families. Age is coded when the participants talk about it concerning their technology adoption. Socio-economic background includes statements about educated and wealthy families or the opposite and how this affected their choices and perception of technology. Sector and type of technologies are coded when discussing technology adoption, e.g.

statements such as "our sector does not give us a choice not to adopt the newest technologies".

Under individual influence factors, the qualifications of confidence, resilience, risk-taking, and openness to learning are recognized from statements of participants such as "I am not scared of anything", "I can learn anything given the opportunity", or "I do not give up". Personal disposition to technology is recognized from statements such as, "I think some people's brains are made for technology" or "I am a person who does not even use a technological phone". Negative and positive perceptions of technology are coded when participants talk about technology as a facilitator or something they need to keep up with because it is forced on them.

Under environmental factors, cultural factors are coded under different codes when participants discuss the society's view of women and domestic responsibilities rooted in the country's cultural structure. Economic, financial and government support are other environmental factors mentioned by the participants directly.

For this study, entrepreneurship is used broadly to reflect who owns or manages a small-scale company as long as they employ less than 250 people although there are different definitions in the literature such as Al-Abri and Rahim (2022) which suggests that entrepreneurs are new initiatives that develop novel solutions in products and services.

This study used technology in a broader sense to include machinery and tools because, contrary to existing research that focuses on women operating in the service sector, manufacturing SMEs are also included. Thus, as explained to the participants in the interviews, technology reflects any machinery and ICT related to the SMEs' area of work.

Method of analysis

The thematic analysis method is used for this study due to its usefulness in capturing the complexities of meaning within a textual data set as the most commonly used method of analysis in qualitative research (Guest et al., 2012). "A theme is an abstract entity that brings meaning and identity to a recurrent experience and its variant manifestations. As such, a theme captures and unifies the nature or basis of the experience into a meaningful whole" (DeSantis & Ugarriza, 2000, p. 362). After all interviews were finalized and the recordings were transcribed, the documents were anonymized, all names and identifying information were removed, and the information was uploaded to Atlas.ti, Atlas.ti, a qualitative analysis

program, was primarily used for coding, which Lapadat (2010) defines as classifying the data by finding similar themes and frequently used subjects.

A combination of inductive and deductive analysis was conducted in the study. This is called an abductive approach, described by Knott et al. (2022) as an approach that brings together inductive and deductive logic to study the data and theoretical frameworks iteratively. The abductive approach is used more frequently since it is seen as a more realistic alternative to a strict distinction between inductive and deductive methods. This approach is well-suited to the exploratory research question and the theory that guides this research, as it suggests that the responses and interactions of environmental and individual factors are different for each individual.

The interviews were analysed by following Braun & Clarke's (2016), six steps of thematic analysis: (1) familiarising yourself with your data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes and finally (6) producing the report.

The IDT theory (Trauth, 2002) suggests 3 main themes: the individual identity factors, the individual influence factors and the environmental factors. Open coding was initiated with these themes in mind. Open coding was applied to the first 5 transcripts to include all relevant information in the analysis and see if there is room to develop the existing theory. The codes were revised several times; the similar ones were merged and grouped under the relevant categories. Since the IDT was developed for the IT adoption of white-collared female professionals, an additional category or "organizational factors" arises when it is applied to female SME owners. The remaining transcripts were analysed according to the 4 main themes: individual identity factors, individual influence factors, environmental factors and organizational factors. The inductive approach was also not wholly abandoned, allowing new codes to arise.

Findings

This section presents findings from the 19 semi-structured interviews conducted to understand the technology adoption among female SME owners in Turkey. The factors that influence technology adoption are categorized into 4 themes: individual identity, individual influence, environmental and organizational factors. Organizational factors appeared as an emergent outcome due to the adaptation of IDT to the entrepreneurship context. The participants included 12 female SME owners and 7 experts. The ages of the SME owners

vary from 32 to 59 years old, and they come from food, textile, communication, beauty and restaurant sectors. An additional consideration of the study is the government policies and programs that target technology adoption among female-owned SMEs, including financial support, training programs, and other forms of support.

The next section presents the individual identity factors that influence technology adoption. Following this, findings about individual influence factors, environmental factors, and finally, organizational factors are outlined respectively. Each subsection presents the key findings along with illustrative quotes from the interviews. Table 1 presents the overview of the findings.

Table 1: Overview of the findings

Individual Identity Factors	**Personal Identity:** • Family support • Age • Informal &friend Support • Socio economic background and role models
	Professional Identity: • Type of technologies used • Sector
Individual Influence Factors	**Character:** • Confidence • Personal disposition to technology • Risk aversion • Resilience • Openness to learning
	Perception of technology: • Negative perception • Positive perception
	Technology adoption considerations: • Cost-benefit balance • Organization fit • Sustainability • Integration challenges • Cheaper versions of technologies emerging constantly • Training of employees
	Skills: • Networking • Information access • Financial engagement • Computer literacy • Education
Environmental factors	**Cultural factors:** • Women's role in society • Male domination in entrepreneurship • Societal expectations of women's domestic roles

	• Positive discrimination
	Economic and financial factors: • Economic crisis • Uncertainty • Inflation • Difficulty of women owned SMEs to receive investment
	Government Support: • The adequacy of financial support amounts • Limited communication • The distribution of government support • Lack of trust to government support programs • Content and structuring of programs
Organizational factors	• Too many responsibilities • SMEs' limited resources and low levels of digitalization • Scalability • Outsourcing • General problems in the entrepreneurship ecosystem

Individual identity factors

Trauth (2002) defines individual identity factors as personal demographic features like age, race, ethnicity, nationality, socio-economic class, parenting status, and career features such as sector and type of technology. The analysis present socio-economic class, family situation such as having supportive family members, type of technology required for work and the sector in which the SME operates as individual identity factors. Two sub-themes emerged:

Personal identity

Personal identity includes factors related to the participant's own features, such as age, family, informal and friend support and socio-economic background, which basically define who they are.

Family support: All participants mentioned the importance of support from family members such as spouses, mothers, and sisters regarding childcare and sharing responsibilities in the house and the company, directly and indirectly affecting their technology adoption. Family support is critical because when they do not have it, they usually postpone their initiatives or keep them at the minimum level, which affects their technology investments similarly. Also, to have time to attend trainings, workshops, and network events about the most recent technology in their sector, they need family support for domestic and childcare responsibilities.

First of all, if I start from my family, we are not in a standard family structure as I said before. I am talking about my own nuclear family; we are not in a family order where the responsibilities are placed on the woman and she cannot do anything else because she is surrounded by these responsibilities. Of course, this is support from my family (Participant 6, Food Sector)

Several participants such as Participant 6 described themselves as "lucky" for not having a traditional-minded spouse who shares the responsibilities in the house. Also, since access to finance is a significant factor affecting technology adoption, financial support from families becomes essential.

*Age***:** Most participants consider age an important factor in technology adoption than any other factor such as gender or education. Participants 1 and 14 talked about their age in relation to technology adoption in a positive way, mentioning as they got older their perception of themselves in terms of confidence and self-worth changed which is reflected in their works and networks they establish. There are some participants who believe that they will never use technology as good as young people who are born in the digital age.

I'm 50 years old, so I'll probably stay in professional life for another 10 years. But I don't see the chance to learn by catching the development in these 10 years. Because I am not a digital born. Therefore, this is a period when I will need someone to assist me (Participant 5, Communication Sector)

Although this respondent has older children, a successful business where she can afford new technologies including trainings, workshops, she still believes she can never catch up due to her age. Participant 18 explains that older generations tend to be more resistant to technology, while younger women are more confident and open to learning.

Informal and friend support: Friend support becomes very important for female SME owners since they have limited resources to obtain information about the technology, solve technological problems or implement new technology. Good relationships with neighbours become a valuable resource in technology adoption, especially if they operate within a technopark or organized industrial zone. It is a sound support system when they have it but this creates dependence on others. Participant 6 talked about her frustration when her neighbour could not offer help on her machinery because he also does not have that specific knowledge. On the other hand, Participant 5 mentioned she learns about the new AI

technologies in her field by asking friends in the same sector. Participant 2 said she goes to a large company in the olive oil production to observe and ask questions about their machinery.

Socioeconomic background and role models: Several participants talked about how coming from an educated, financially well-off family with a modern mindset positively impacted their education and future endeavours. Participant 9 talked about how having a brother as a role model and parents with idealistic occupations affected her relationship with technology. Having a family financially supports them also affects their freedom to invest in new technologies.

On the other hand, another SME owner who lives in a city in eastern Turkey where traditional norms and patriarchy are more robust talks about although she could not go to university because her family thought she should get married instead, how she improved herself and started her company from scratch, learned about several support programs with her efforts and now opening a second branch to her successful business. She was the SME owner who was the most excited about new technologies and had the utmost confidence to implement them.

> *After all, I am a capable person even though I didn't go to university., I am a hardworking person. More precisely, I am a person who can make a living out of anything. ... My family, you know, because the cultural structure is a little bit different in the east, when the girl turns 18, they will immediately give her away and marry her off. So, I couldn't study because I had this cultural structure (Participant 3, Food Sector)*

This shows how personal characteristics can interact with identity factors. For other women, not having a chance to receive a high education or getting married and having children at a young age can be a barrier. However, with her confidence and resilience, it became a driving force to overcome these barriers.

Professional identity

Professional identity is related to the area of work concerning technology adoption and consists of the sector and type of technologies used.

Type of technologies used: The type of technology is a part of individual identity factors, as Trauth (2021) suggests that some technologies have a boys' club culture. Role congruity theory can explain this: while some technologies are categorized as "male" in women's minds, they can easily embrace others, such as social media.

A separate code is used to see the general picture of the technologies they use. Digital irrigation, manufacturing technologies like freeze dry and milling, laboratory and analysis technologies, motion sensors, Enterprise Resource Planning Systems, lean production, graphic design software such as Canva, AI such as Notion, DeepL, ChatGPT, food recycling, data gathering, Robotic Process Automation, Google Drive, search engine optimization, laser epilation tools, cloud technologies, waste utilization and management were the ones participants mentioned as the technologies they use. Contrary to the previous research, none of the participants mentioned social media or online sales if they were not asked directly because even though they were using social media and online sales, they were more enthusiastic about other complex technologies such as ERP and waste utilization.

The distinction between AI technologies and industrial machinery is the most important when it comes to the type of technology as a factor in their technology adoption. The SME owners from the communication sector emphasized that they use the latest AI tools since they do not require significant investments, and it is easy to find young people equipped to work with those technologies. However, acquiring machinery is much more difficult regarding financing, maintenance, and finding skilled personnel to operate it.

I mean, they are renewed very fast. As of this new year, that is, since it is an annual subscription, I tried to buy all the programs of all of them, but if a new one comes out, we will buy that too. You know, as I said, since this is not an industrial company and I am not buying a 3d printer… Ours are based on AI applications, that is, if there is a new AI application or a new program that emerges, we will buy it (Participant 5, Communication Sector).

Participant 5 explained how it is easy to acquire digital technologies and hire people to use them because they are mostly AI, although she always uses them through her assistants because of her age. She can still benefit from those technologies because many young people work for low salaries or even work for free to gain experience know how to use them.

Although none of the SME owners mentioned social media or e-commerce as the technologies they use, most experts think that since the required technologies are accessible and easy to use, most women entrepreneurs operate in e-commerce or focus on social media marketing. Participant 18 shared his observation that while women in some sectors can use complicated technologies for their work, such as the beauty sector, they may fail to use simple technologies like online banking which was also the case for one of the SME owners.

In terms of technology, I have a good command of the technologies related to my own work, I use them well, but I think I am a little weak in computer technologies such as computers, etc., phones... again, more or less on the phone, but I think I am a little weak in such computer technologies (Interview Participant 17, Beauty Sector)

This is an example of how the categorization of technology as a "male domain" can influence the adoption of such technology. When I asked her opinion about why she can use complicated technologies for her work but has difficulty turning on a laptop, her response was, "It is my work; I have to do it". This can be interpreted as; since women are the primary users of such technologies and do not have male competition in the beauty sector, they do not have difficulty using complicated machinery because it is expected of them. When it comes to simpler technologies such as online banking and computers, their confidence level decreases because their perception of that technology is based on the belief that they are incapable.

Sector: Each sector has standards, norms and practices that influence how entrepreneurs perceive themselves and their work. Also, the sector determines the technologies required along with the skills and know-how. As explained above, finding people with expertise in ICTs is easier, but finding machinery operators is more difficult since it requires specific training. This leads to different considerations for women in different sectors. According to Participant 19, the textile sector is not very advanced in automation and depends mainly on manual labour and this is because the sector has low profitability. On the other hand, as participant 5 explained, the communication sector does not have the chance to refrain from adopting new technologies because their business is entirely tech-based, and there is fierce competition to operate with the latest technologies.

In summary, factors such as age, family support, socio-economic background, type of technology, and sector influence the adoption of technology by female SME owners in Turkey. Family support, especially in childcare and finance, is critical in facilitating or delaying technology adoption. Age has diverse effects, positive for some women while causing insecurity for others. Informal and friend support is a vital resource that compensates for the limited resources but creates dependence on others. Socio-economic background and role models also shape technology adoption experiences, creating an advantage for women from supportive and financially stable backgrounds. Professional identity, including the type of technology and sector, also influences women's technology adoption, because some sectors

are more technology-dependent than others and some technologies are easier to adopt than others.

Individual influence factors

The individual influence factors consist of personal characteristics such as education, character, and skills, as well as personal influences such as mentors, role models, experiences with computing, and other significant life experiences (Trauth, 2002). The analysis presents character, perception of technology, technology adoption considerations and skills as main themes under the individual influence factors.

Character

The most prominent character features that affect the adoption of technology by female SME owners are confidence, personal disposition, risk aversion, openness to learning, and resilience. Although they seem to overlap, *perception of technology* is women's view of technology and its outcomes, whereas *personal disposition* is about their ability to learn and use new technologies. For example, Participant 2 has a positive view of technology, especially regarding waste management, but she mentions that her ability to learn and use it is limited.

Confidence: Some participants associated their higher confidence with older age, and some believed they could never catch up with technology due to their age. However, contrary to the literature, Participants 2 and 6, who clearly indicated that they are insecure in their technological capabilities are both in the younger group of participants and both STEM educated. The most confident women in the sample are the oldest group with no STEM education, such as Participants 1,3,4 and 14, who believe they can do anything when given the opportunity.

I'm not even a person who can format a computer. I mean, to install an application or in that application. I still can't use adobe's design thing (Participant 2, Food Sector).

Participant 2 is one of the youngest participants with STEM education. However, she mentioned a couple of times during the interview that she does not have confidence in using technology and learning a new one. This finding contradicts the literature and shows that rather than a simple cause-effect relation, the interaction of different personal and environmental factors is relevant in the technology adoption of female SME owners. On the other hand, Participant 1, who is 55 years old, when asked if she has concerns about adopting

new technologies, mentioned that she does not, giving the example of online banking she has been using since it came up for the first time.

Personal disposition to technology: The SME owners who are passionate about technology generally believe that it is due to their unique disposition, which makes them different from other women. Another group believes that they are only interested in technology as long as it makes their lives easier, but only in a pragmatic way.

> *I really enjoy following technology with great interest. I believe some people's brains are truly made for this. I think I am one of those people because I learn technology easily. My brain can direct me towards it. So, there is no problem with learning (Participant 3, Food Sector)*

Participant 3 is a successful SME owner without high education and mentioned that she built everything from scratch with her own efforts. During the interview, she emphasized her love for technology since childhood. This shows that passion for technology is not necessarily a male feature and can be an essential resource for women in overcoming difficulties in technology adoption. On the other hand, some participants mentioned that they do not feel any passion for technology; it is simply a tool for them.

> *I'm not like some technology lovers. Maybe there is a distinction between men and women here, but let me tell you by the way, for example, the way my male friends around me, my friends' spouses, etc. look at technology is never the same as mine or women's. I mean, they (men) live every moment of it with incredible excitement, I mean, they say, does that electric car do this, how fast does it go, and so on and so forth, I don't feel that kind of excitement in that sense. I mean, I just get excited that it will make our work easier, it will increase our productivity, how nice, we will have to work less, people will have to work less, that is, the technological object or the software itself does not excite me. What it serves excites me (Participant 19, textile sector).*

The way Participant 19 talks about her relationship with technology shows that there is also a perception that it is normal for women to have a less enthusiastic, pragmatist view towards technology.

Risk aversion: Risk aversion in relation to technology adoption has been frequently mentioned in the literature. As a result of the analysis, the participants mentioned that women

prefer less risky activities. The general perception is that this is not inherent in women but is due to their circumstances.

> *They prefer less stressful environments, perhaps risk-free initiatives. I don't want to say that it is their nature, but when we look at their roles in society, the roles they play and the role models, this is the case. Men are a bit braver in this regard (Participant 10, Expert).*

On the other hand, Participants 5 and 7 who see themselves as risk-takers talked about how taking risks is essential to entrepreneurship. They believe women need to leave their comfort zone to be successful entrepreneurs. In their perception, entrepreneurship equals risk-taking, and women who do not want to take risks should choose other forms of employment.

Resilience and openness to learning are also characteristic features of SME owners, which the participants mention many times. Resilience becomes critical since women need to overcome more barriers than men to succeed. Older SME owners who started their companies late, such as Participants 1 and 3, especially emphasized resilience as their primary characteristic. Most participants mentioned openness to learning as an essential qualification for technology adoption.

Perception of technology

The analysis captured both negative and positive perceptions of technology of female SME owners. The negative perception includes concerns about information security, ethical concerns about AI learning, the potential negative impact of technology on social life, being replaced by technology, the digital divide and its effects on society, effects of technology on creativity, concerns about remote working such as its impact on company culture and technology complicating existing procedures.

> *Honestly, I'm not one of those who believe that it's right for technology to make our lives easier. Just a moment ago, I saw an advertisement. It chops, stirs, and cooks. A new machine came out. I thought, for God's sake, laundry isn't washed or dried. Sometimes it's not even ironed. We wash the dishes in the machine. We do all of these with machines. Now, even cleaning the floor is extremely technological; we finish a task that might take two hours in just half an hour. So, let's at least cook our own meals. I mean, let there be some movement in our lives. Because each of these tasks is actually a routine that the body needs. While doing them, you socialize, you enjoy it. You reach a certain emotional state. There are healing aspects to it. That's why the*

extent to which technology is involved in our lives, both socially and personally,
makes me uneasy. (Participant 2, Food Sector).

Positive perception of technology includes being a facilitator, accelerator, green, efficient, preventing waste, saving time, and increasing people's welfare. Also, the findings are compatible with RCT, which suggests that women tend to value communal goals more than men (Harmon & Walden, 2021). How women talk about technology reveals that green and waste-prevention technologies are important to them. Participant 2 produces innovative products from olive waste, such as heating pads and olive powder. Participant 4 focuses on decreasing the waste aspect of technology. Participant 7 uses animal waste to produce collagen and indicates that it started as an attempt to help a friend cure her illness. Participant 19 mentioned she appreciates technology for increasing the well-being of people, such as by allowing her employees to work shorter hours. Participant 6 is interested in laboratory technologies for functional food R&D since she changed her entire career after having kids, because she felt bad about producing food with harmful additives while feeding healthy food to her kids.

Technology adoption considerations

Several themes were revealed when women were asked what aspects they pay attention to in technology adoption processes. Cost-benefit balance and choosing the right technology regarding organization fit are the most prominent subjects. Sustainability of the technology, such as planning for maintenance costs, integration with other technologies within the company and technologies of stakeholders, cheaper versions of technologies constantly emerging, and training of employees, are the other things women take into account in technology adoption.

It was observed that all considerations of SME owners are rational and based on a serious thought process. None of the participants talked about ease of use as their primary concern, as claimed in the literature on the adoption of technology by women. The observation from all participants is that risk aversion, shown in the literature as a disadvantage, can actually be a strength for women entrepreneurs. This is because most of them have a very logical and pragmatic view of technology, and they spend much time observing the emerging technologies, weighing costs and benefits. This can prevent them from jumping into big technological investments that would not contribute much to the processes or will be idle in a couple of months due to a lack of organizational fit. Also, contrary to the literature, it was observed that women care a lot about technology

organization fit; it is the first thing most of the participants talked about when they were asked what the milestones of adopting technology are for them.

> *Why are we shifting to it? What reason prompted us to start this process? Is the final product as we thought or as we wanted? Is the juice worth the squeeze? Are we able to cover the cost of all those changes, the money spent, and the learning process in the final product, or can we achieve a similar result with traditional methods? Sometimes, just being technological doesn't mean it is good. ... Sometimes we can use more basic products in production while using more high-tech things in the laboratory. ... There is nothing wrong there. We don't say things like we are a technology company, so everything has to be high-tech. Some of our processes are very basic. But it can still produce top-notch results. If you usually dry something in 10 hours but it takes 40 hours in freeze-drying, we certainly do not bear three times the production cost just to say we use freeze-dry technology. So yes, if it meets the prerequisites I mentioned and adds value to us, then we consider it (Participant 7, Food Sector)*

The above quote reflects the SME owner's thought process when deciding to adopt technology, which includes a detailed and comprehensive evaluation of the necessity of technology, cost-benefit balance, and organization fit.

Skills

The final sub-theme in individual influence factors is the skills needed for technology adoption: networking, education and computer literacy.

Networking: The analysis reveals a widespread belief that women are not as good at networking as men. Networking problems bring along problems of access to information. Experts and SME owners talk about many women having innovative ideas and great potential. However, they fail to materialise them because they do not know how to obtain information about the right technologies to actualize those ideas. This overlaps with the findings of Orser and Riding (2018), who claim that women often do not know which questions to ask and how to get information.

> *We hear this a lot. I want to do something. She is aware of her potential, wants to produce, wants to do something, but doesn't know where to start and is looking for guidance. She is waiting for someone to tell her to start from here (Participant 18, Expert)*

Participant 18's explanation is in line with the perceptions of SME owners about themselves. Participants 1 and 5 mentioned they do not know which questions to ask and where to look when they need information about a particular technology.

Experts such as Participants 8,10 and 13 mentioned that because business networks are dominated mainly by men, it is harder for women to enter these circles, which makes it harder for women to find technological partners. In addition, there is a perception that women do not talk about business even when they participate in those networks. This is also compatible with the findings of Orser and Riding (2018).

> *I think that women are much weaker in networking than men, that women's social interactions with each other are defined more through their family identities, that is, this can be their lovers, this can be their love life, when they have a child, it can be the care of a family elder, but this compassionate hugging role. and I observe that talking about work among women is stigmatized as if their whole life is work (Participant 5, Communication Sector).*

Participant 5 believes women identify themselves with motherhood or spousal roles more than their business roles, and networking events are used to bond through these roles instead of discussing business. However, Participant 11, an expert with extensive experience with women entrepreneurs, believes that women are better at networking than men. Interestingly, she believes maternal instinct and motherhood roles are actually strengths of women in terms of networking because women pay more attention to the people they talk to; they have a drive to protect and care.

Education and computer literacy: Although this was not a problem among SME owners who participated in the study, the level of education and computer literacy are problems for female SME owners, according to experts. Participants 2,13,16 and 19 mentioned how level and area of education influences technology adoption. Participants 16 and 18 mentioned that, especially for micro-enterprises where women work out of their homes or very small establishments, computer literacy becomes a significant problem. According to Participant 16, this also brings together a lack of financial engagement, where women leave all financial matters to their husbands or accountants.

> *When we contact employers about financial affairs such as invoices, they say, "Let me ask my husband about this. … For example, we say that you will make a support*

payment in the project. We remind them of the payment, ... They say, "Let me ask my
husband if he has made the payment (Participant 18, Expert)

The analysis of individual influence factors shows that personal characteristics and influences such as confidence, personal disposition, risk aversion, and skills significantly impact female SME owners' technology adoption. Confidence, usually associated with younger age and higher education, appears to be a standalone factor in overcoming other difficulties. Personal disposition can be negative or positive, potentially impacting the approach to technology. Although generally perceived as a disadvantage, risk aversion can lead to more logical and pragmatic technology adoption decisions. Skills such as networking, education, and computer literacy show the importance of tailored support to improve technology adoption among female SME owners. The findings present the complex interaction of personal and environmental factors affecting technology adoption.

Environmental factors

Contextual aspects in society, institutions and organizations, cultural attitudes and values related to where one lives and economic and political factors in that region/country that facilitate or discourage technology adoption are categorized under this theme (Trauth, 2002). 3 main sub-themes emerged: cultural, economic, financial and government support.

Cultural factors

Cultural factors that participants discuss are mainly women's role in society, the concept of positive discrimination, societal expectations of women's domestic roles and women's struggles in the business world.

Women's role in society: Participant 2,6 ,9,11,13,18,19 mentioned society's view that women cannot be successful or they do not belong in certain occupations affect their perception of themselves. Participant 1 mentioned she did not have the freedom to actualize her innovative ideas when she was younger and had young kids. Participant 8, who studied automotive engineering, mentioned that only seven women were in her class of 85 students. According to Participant 10, society's view of women pushed them to pursue less risky and less stressful initiatives, affecting their technology investments. She believes this is because society does not welcome ambitious women with purpose, whereas men with the same qualities are praised and encouraged.

Another view of the experts is that some SMEs are only owned by women on paper to benefit from women's support programs, but the actual decision-making on all important

aspects is left to the husbands or other men in their families. There is a belief that women accept the roles attributed to them and treat these as part of their female identity.

> *Women seem to accept their roles over time. Perhaps they also find satisfaction in conforming to societal norms? Like when you can't figure out something on your smartphone and immediately ask a male friend. Asking in a more feminine manner? Maybe she even finds it attractive, like, "How nice it is that a man helps a woman." It's like a mutual thing (Participant 10, Expert).*

This observation is in line with the role congruity theory. Participant 10 believes that some women do not spend too much effort themselves when they face a problem with technology because they believe it is expected of them. She also mentioned that women who are good with technology change how they talk, dress and behave more like men to gain acceptance in technology networks. In line with this observation, Participants 1 and 3 described themselves as "male-minded" while discussing their fascination and capabilities with technology.

Another aspect which is a result of women's role in society is the male-dominated entrepreneurship ecosystem. The labour market, in general, is male-dominated, but due to women choosing or having to choose paid jobs with more decent hours and more guarantees, gender disparity is worse in terms of entrepreneurship. This is also related to another problem mentioned by SME owners: the feeling of not being taken seriously in the business world.

> *For one, as a woman, a young woman, I don't think my words would carry weight there. I have this fear, and it's justified. … Let's draw a typical Turkish businessman: fat, bald, with a belly, wearing a suit. Now, when he gives an order at the table, it's not the same as when a woman does. I mean, for example, I have to say it ten times, really. After a while, it turns into a test of patience and becomes a nerve-wracking battle, and you end up having to shout and scream. Then you get labelled with something else. Like being a witch, overly aggressive (Participant 19, Textile sector)*

Participant 19 believes that she faces more external resistance from her employees to the ERP system she is trying to implement because she is a young woman.

Other factors related to women's role in society appear to be perceptions of male disposition to technology. Participant 10, as mentioned in the previous section, believes this is due to role congruity. Participants 1, 6 believe that men are inherently better with technology. Participants 2, 10 and 19 believe it starts in childhood when boys are encouraged

to play with bicycles and video games and girls with dolls. Participants 3, 5 and 7 believe there is no difference between men and women regarding technology adoption.

Societal expectations of women's domestic roles: Participants 6 and 11 talked about how women are occupied with pregnancy and childcare when they are at the age where they could take more risks. They also discussed how owning a small company and having domestic responsibilities make it very hard to attend trainings, workshops or research about technology.

> *You know, while we go home and take care of the dishes and laundry, they can sit and watch it on the phone and look at the application. they have more time; they have less responsibilities (Participant 14, Communication Sector).*

Participant 14 talked about how her male employees tend to have more knowledge of recent applications than herself, and she does not have the time to research new technologies due to her domestic responsibilities.

Positive discrimination: Interestingly, positive discrimination appears to be a controversial concept some SME owners have criticised. The problem is that they believe that most government and private institutions use positive discrimination or women's entrepreneurship concepts for publicity, while no substantial support is provided to women in business. They believe this creates hostility towards them from their male colleagues, and since they do not receive support in the real sense, it does more harm than good.

> *There is a very wrong perception of positive discrimination, and I think it really needs to be corrected. ... I am uncomfortable with it. By adding the word "woman" it is as if they will support us differently, but this concept both separates us in society and you know, okay, you said it, then give it. So, what you give is something that is empty (Participant 9, Food Sector).*

Participant 5 mentions that positive discrimination does not belong in entrepreneurship because it is inherently risky to be an entrepreneur, and female entrepreneurs need to choose whether they want to be seen as women or entrepreneurs. There is an agreement among SME owners that the entrepreneurship ecosystem must be supported as a whole. In addition, several SME owners talked about the focus of institutions on the PR value of women entrepreneurs, which hurt their image by emphasizing "traditional women producing basic food or handicrafts" and preventing female entrepreneurs from being taken seriously.

Economic and financial factors

All participants agreed that economic and financial factors are the most pressing matter in adopting new technologies. All SME owners mentioned that the economic crisis and the accompanying uncertainty caused them to postpone their technology investments. Participant 12 mentioned working 12 hours a day to get by, so she cannot even find time to learn how to use mobile applications from her son. Their businesses are also affected by the economic crisis, and the high cost of credit makes it harder to finance new technologies.

> *Now, for example, there are barcode systems, there are systems to stock them, digital systems, but you ask something, everything is 100,000, 200,000, 300,000, you say, now, then I have a system that works manually. Do I have a budget to allocate for this? You say, no, then we say let's continue with manual for now. In other words, what my heart desires and what my work in reality brings me is unfortunately not always parallel in this inflationary country with no end in sight (Participant 1, Food Sector).*

Participant 1 talked about her failed attempt to acquire a new barcode technology due to financial reasons.

Finding external investors, such as venture capital funds and angel investors, is also a problem. Participant 9 mentioned that it is almost impossible for SMEs with women founders to receive investment because of the prejudice that women will not be successful.

Government support

The analysis shows that government support programs are crucial for women SME owners. As a developing country with some shortcomings in its entrepreneurship system, it is not surprising that government support for a disadvantaged group like women is crucial.

Separate code is used for the programs and institutions they mentioned while discussing government programs. KOSGEB (Small and Medium Enterprises Development Organization) and Ministry of Industry and Technology were the most frequently mentioned institutions. TUBITAK (Scientific and Technological Research Council of Turkey), women cooperatives, TKDK (Agriculture and Rural Development Support Institution), UNDP (United Nations Development Programme), KfW (German Development Bank), KAGIDER (Women Entrepreneurs Association of Turkey), TÜGİP (Turkish Food Innovation Platform), Development Agencies, Social Security Institution, universities, Ministry of Commerce are the other institutions mentioned by participants when they were talking about government

support. Projects designed for women entrepreneurs that participants mentioned are Women Up (support for women's employment), Empowering Women in Agrifood (Co-funded by EU), Women in Tech, and Women's Empowerment Project (UNDP).

SEECO (Social Entrepreneurship, Empowerment and Cohesion Project), which is implemented by the Ministry of Industry and Technology, World Bank and financed by the European Union's Facility for Refugees in Turkey (FRIT), Sector on Campus programme, R&D and Design Centers that are also implemented by Ministry of Industry and Technology and UR-GE (Project for the Development of International Competitiveness) carried out by the Ministry of Commerce are the mentioned support projects and programs that are open to both men and women.

It is understood that many institutions and programs are available for women entrepreneurs in Turkey. However, participants highlighted several problems that prevented them from effectively using these programs.

Financial support amounts: All participants mentioned that due to the economic crisis and rising inflation, the amounts provided are insufficient for SMEs to acquire the necessary technologies.

I think they don't have money. Women can't do anything without money. So, money is very important. Five years ago, I was given a budget of 200.000 TL by TUBITAK. With a budget of 200.000 TL, we had to make an R&D project and start the initiative. At first, I thought how big 200.000 TL, how are we going to spend it? Then, in the 3rd month, the money melted away (Participant 7, Food Sector).

Since government support takes time to apply for and receive, inflation becomes a bigger problem. Thus, Participants 7, 9 and 12 indicated that non-monetary incentives instead of direct financial support, such as tax incentives and utility subsidies, would be much more effective. Participant 2 explained that she would prefer regulatory incentives that mandate state institutions purchase from SMEs since this would reduce government costs while providing essential support for SMEs.

Limited communication: Participants 12 and 14 mentioned that they heard about programs coincidentally. Participant 3 and 5 said that they had found information about these programs through their own efforts and extended research. Participants 8 and 10 also mentioned the need for better communication. Participant 4 mentioned that the contents and conditions are not clearly stated, and awareness about government support programs is lower,

especially in the rural parts of the country. Participants 1 and 4 also mentioned that they got limited answers when they contacted government institutions for information.

The distribution of government support: There is a perception among SME owners such as Participant 3,5,6,14 and 19 that those who need it most or who would produce the most added value from it are not receiving the support. Participant 3 talked about getting rejected from a machinery subsidy due to her age. However, she believes she could produce more value than younger women who received the support.

Both experts and SME owners mentioned people trying to exploit these support programs through deceptions such as falsely presenting their enterprises as women-owned, hiring women only on paper to receive employment support or companies that misuse start-up machinery subsidies for capacity increase. Participants 13,15,16,18 were responsible for overseeing the proper use of funds within a women support program, and they explained that they are trying to prevent this via on-the-spot checks and audits. However, as long as everything is in order on paper, the sanctions they can impose are limited. This shows that women do not receive the actual amount of support shown in the statistics.

The participants mentioned extra monitoring requirements that are applied to prevent the abuse of the support programs and this makes it harder for SME owners to participate in them.

.... In other words, there are tracking systems that involve too much mathematics and are too far away from the practice of the work. Therefore, we do not want to spend time on this. We don't want to allocate labour (Participant 4, Textile sector)

Participant 4 mentioned that she had never applied to any government support program, and when asked why, she explained as above. Participant 3 talked about because of this strict monitoring, she feels punished instead of the actual abusers.

The focus of government support programs on technology companies is another issue that SME owners raise that affects government support distribution. Some participants believe the majority of the support directed to sectors such as software development naturally leads to other non-tech sectors not receiving enough support. Since tech companies are dominated by men, whereas most women operate in sectors such as food, textile or services, this creates an uneven distribution of support between men and women. Participant 6 from the food sector said they were not even considered entrepreneurs until recently because the

general perception was that entrepreneurship equals software development and digital technologies.

Focus on the PR value of women entrepreneurs is another reason that some SME owners believe that government support is not distributed correctly. Also mentioned in the previous section is the participants' perception that supported women entrepreneurs are selected based on the promotional value they will provide rather than on their achievements or the added value they create. They believe this leads to the promotion of older women in the traditional, basic food sector rather than educated women involved in innovation and R&D activities.

> *You've had your education, you've improved yourself. This story does nothing for them. "I have suffered a lot, I have been like this, I have been like that, I have done this and that for my family, I have done this and that," and sometimes it is obvious that these stories are fake, sometimes I know that they are fake (Participant 6, Food Sector).*

Participant 6 talked about her experience in a competition where she believes instead of highly equipped women entrepreneurs conducting R&D activities, an older woman making jam was chosen to be the winner of the competition.

Lack of trust in government support programs: Participant 3 mentioned that the programs she participated in did not make the payments on time, and she suffered losses. Participant 4 stated that after they joined and made investments with the promise of government support, the programs were cancelled unexpectedly. Participants 12 and 14 discussed repayment conditions, such as changing interest rates without prior notice. Although this is not directly related to women entrepreneurs, it is worth mentioning since it could affect their future participation in the programs.

Also, the SME owners who applied and got rejected from these programs mentioned that they were not informed about the reasons for the rejection. This lack of transparency adds to the lack of trust in government programs and deprives women entrepreneurs of the chance to improve themselves. An SME owner who did not hear back from a program after applying to it reflects her frustration and confusion in these words

> *No, nothing happened. Neither a rejection nor any news. Yes, for example, a relative of ours, my cousin, benefited from it. Maybe it's because we had two employees at that*

time, I don't know. But they also had two employees. No, we didn't get any response (Participant 17, Beauty Sector)

Content and structure of programs: Lack of childcare support, the content of training programs, pressure to make quick decisions and pay back due to very short program durations, and complicated application procedures are some of the problems that participants mentioned. Although the lack of childcare has the most potential to affect women entrepreneurs because the participants either have no kids or have kids who no longer need care, it was not the most pressing topic for them. However, they talked about how it would change many things for them in the past and how currently their friends suffer because of it.

The participants believe that the fragmented structure of the programs hinders their effectiveness. The SME owners usually talk about this compared to programs funded by the EU and UNDP, mentioning that they follow a more integrated approach than national programs. This approach refers to an end-to-end support system that addresses different needs for different phases of the enterprise from its start. Participant 9 mentioned the need for an integrated approach in national programs, giving the example of specific sales support. She explained she received a sales support but she also needed support for production, packaging and branding. Thus, she had to research and apply to other programs in different institutions, delaying her initiatives.

The quality of mentorships is also related to the effectiveness and content of the support programs. Participants 2, 6 and 9 mentioned that mentors tend to provide general and theoretical knowledge instead of the tailored support they need. However, mentors who can provide information on technological tools that they can use in their business would be much more beneficial. According to the participants, mentors should have sector-specific knowledge to understand their actual needs and problems and provide beneficial information.

There is an accumulation on the digital technologies and software side. Everyone knows that subject. In other words, since those jobs in entrepreneurship attract the attention of those teams, mentors are clustered in that field) Participant 6, Food Sector)

The focus on tech companies is also reflected in the mentorship. Most of the mentors specialise in areas such as software development, which prevents other sectors from finding mentors who are knowledgeable in their field.

To sum up, environmental factors significantly impact the technology adoption decisions of female SME owners. Societal expectations of women's roles create significant barriers, while positive discrimination practices are perceived negatively by some women entrepreneurs. Economic and financial problems also prevent their technology investments. Additionally, government support programs need to be more effective and accessible, and there is a need for tailored and integrated support systems.

Organizational factors

Since IDT was developed for women who work in IT jobs, the theory did not take organizational factors into account. Thanks to the inductive start of the analysis and open coding, this theme appeared as an emergent outcome.

Organizational factors are related to being the owner of a small company. First, owning an SME brings many responsibilities that must be carried out simultaneously. Combined with women's existing responsibilities as mothers and at home, this places a strain on their ability to devote time and resources to technology adoption. Participant 9 explained they could not even afford to recruit young people who would work for free to gain experience in digital technologies such as big data analysis they plan to implement soon because they do not have time to sit with them and teach them about the procedures of their enterprise.

SMEs' limited resources and low levels of digitalization make it difficult to find qualified employees. This creates a vicious cycle, as the participant 8 described, where they need a skilled workforce for technology adoption, and young, skilled people do not want to work in SMEs if the work is still carried out in traditional ways. There is a strong chance that this affects women asymmetrically since women tend to own smaller enterprises than men.

> *We have heard so many things from these companies that they don't come, they blame young people, it's not like that. It is not satisfactory both in terms of wages and why should I make molds by hand there? You know, they are thinking why should I still spend a large part of my time making molds by hand instead of learning adobe illustrator and doing new things and using my talent in a better way (Participant 8, Expert).*

Participant 8, a young woman and an engineer, discussed her own experiences with the SMEs she currently works with how SME owners complain that young people do not want to work with them because of their low technology adoption.

There are other problems, although not directly related to being a "female" SME owner, but still affect them, such as scalability and outsourcing. Most of the time, technologies are developed for larger firms, which creates the problem of scalability for SMEs.

> *We actually need much more detailed solutions. Since most solutions are made for big companies, ... companies with many employees are working on that report 100 times more, which is not the case with us ... Most things are not realistic because they are not developed exactly for our problems (Participant 9, Food Sector).*

Participants 6 and 9 also mentioned outsourcing in relation to their technology adoption. Acquiring all production technologies is very difficult, especially if they have a wide product range. This causes SME owners to choose the option of outsourcing the technologies and focusing on R&D and marketing the products.

Most participants discussed the general problems in the entrepreneurship ecosystem. Participants 5, 6, and 7 talked about how problems in the ecosystem also affect women entrepreneurs and how problems such as access to finance should be addressed first before offering special support for women entrepreneurs.

Female SME owners face barriers in technology adoption due to their responsibilities within the scope of work and home combined, limited resources, and difficulties in recruiting skilled people. Addressing these difficulties requires policies supporting the entrepreneurial ecosystem as a whole, ensuring that SMEs, particularly the ones owned by women, can incorporate and benefit from technological developments.

Discussion

This study aims to answer the following main research question: How do individual identity, individual influence, and environmental factors shape the experiences of female SME owners in Turkey regarding technology adoption? The factors affecting their technology adoption were analysed under the Individual Differences Theory (IDT). The basis of IDT is that the analysis of women should be done on an individual level because every individual responds to environmental effects differently (Trauth, 2002).

The analysis shows that women can be very different from the general picture drawn by the literature and society. Regarding individual identity factors, the expectation drawn from the literature is that age is a negative influence on the technology adoption of women

(Expósito et al., 2022, Ibrahim, 2018; Orser et. al., 2019) and yet, although it is the case for some participants, for others age is a strengthening factor both for their understanding of technology, and their technology investments. This shows that the influence of age on technology adoption is more nuanced and may differ among women. There are some commonalities, such as the dependence on family support, which is indispensable for being an entrepreneur. The participants either have supportive husbands or are not married or divorced. This dependence on family support should be taken into account by policymakers. One of the macro outcomes of the policies followed by the government should be to decrease this dependence.

The individual influence factors also revealed some surprising results. Research suggests that women tend to focus on the ease of use of technology rather than its usefulness and organizational fit (Expósito et al., 2022; Venkatesh et al., 2000). However, most SME owners in the study mentioned the technology-organization fit and cost-benefit balance as their most pressing concern. This may be related to their higher risk aversion, which literature presented as a negative factor for technology adoption; however, it can also be interpreted as women making planned and logical decisions.

The environmental factors showed that economic uncertainty is the most common issue for all SME owners when deciding whether to adopt a new technology. On the other hand, there were some unexpected findings regarding cultural aspects, such as positive discrimination. Some SME owners think positive discrimination and concepts such as women's entrepreneurship are problematic and prefer that the entrepreneurship ecosystem is supported as a whole. They believe, especially if no substantial support is provided and this kind of women-only programs are used for publicity, it does more harm than good. Some women entrepreneurs feel that men look at them and think they still cannot succeed despite such preferential support. Also, some believe that it creates hostility towards women and leads to more isolation from networks. The policies and programs for SMEs should be revised to improve the ecosystem in a way that supports female entrepreneurs without isolating them. This can be done by going to the root of the problems and providing grassroots training to change society's view of women instead of treating women as a separate group.

It is impossible to present all combinations of individual identity, individual influence, environmental and organizational factors, but highlighting the most salient ones can guide policymakers and future research. Characteristics of confidence and resilience help them to

overcome barriers caused by age, lack of education, society's view on women, or domestic responsibilities that cause extra burdens for them. They overcome the lack of tailored policies such as childcare with family support and difficulties with networking with friend support. The interaction of different factors leads to surprising results, such as the perception of older age as positive and positive discrimination as negative.

Adapting IDT, originally developed for women working in IT sectors, to the entrepreneurship context expanded the theory to include unique experiences of women entrepreneurs in technology adoption. As mentioned before, entrepreneurship is an even more male-dominated arena than the labour market in general. Women entrepreneurs have to carry out many tasks in addition to their responsibilities as mothers, wives or daughters. Also, in the entrepreneurship context, their character and skills, such as risk-taking and confidence, become much more critical since they are the primary decision-makers of the company. The environmental factors are also different from white-collar women, such as gender biases in access to finance and not being taken seriously in the business world, which makes technology resistance from employees a much bigger problem for female SME owners.

Government support is critical for female SME owners as a disadvantaged group in a developing country with some shortcomings in its entrepreneurship system. As mentioned by several participants, it is necessary to provide end-to-end support with a more integrated approach, treating the entrepreneurship ecosystem as a whole rather than focusing on the publicity aspect of women's entrepreneurship. When support is not integrated- meaning that only partial support is provided for particular phases or activities such as sales or marketing—entrepreneurs may be unable to move to the next phase or benefit from the support offered because they need support for earlier phases. For instance, a government institution announces that a large number of women entrepreneurs participated in their marketing programme on their website for publicity. However, these funds could be utilized more efficiently by offering end-to-end support to fewer women. Also, older age being a disadvantage in participating in some support programs can be reconsidered because findings show that age is not necessarily a negative factor, and societal factors lead to women starting their entrepreneurship after raising their kids.

Most participants emphasized that in rural areas, education and awareness raising for women and girls in general should be prioritized rather than women-only entrepreneurship support. The experts with rural experience highlighted deep problems emanating from gender disparity in these regions, which leads to the exploitation of these programs by men, such as

women who are so-called "participating" in the support programmes but who are illiterate. Several participants emphasized that positive discrimination should be directed at rooted issues and should be focused in rural areas where women are way more disadvantaged than in urban areas.

This study has several limitations. First, although women from different sectors were included in the study, it is possible that the experiences and problems of the food sector are reflected more. Also, most of the SME owners are from urban areas. Although experts' opinions were included to reflect the situation from rural areas, regarding first hand experiences of women, the findings are limited. The study's conclusions may not be broadly applied due to the nature of qualitative research, which prefers depth to breadth. However, showing that women entrepreneurs can be much more than some research pictured them is a valuable contribution to the literature. Future research should focus on applying IDT to different sectors and sizes of SMEs to understand sector-specific problems of women in micro, medium and small enterprises. This would inform policymakers to establish policies tailored to women entrepreneurs' needs.

Conclusion

This study aims to answer the following research question: How do individual identity, individual influence, and environmental factors shape the experiences of female SME owners in Turkey regarding technology adoption? Regarding individual identity factors, age has a diverse impact on female SME owners' technology adoption. Family support is critical, and most women entrepreneurs depend on it due to shortcomings of the policies. Friend support compensates for these shortcomings and the limited resources of female-owned SMEs. Socioeconomic background is important in shaping their perception of technology, but its negative impact can be compensated for by individual influence factors such as personal characteristics like confidence and resilience. Skills such as networking, computer literacy and financial engagement appeared lacking in some women entrepreneurs. Cost-benefit balance and organizational fit are the most outstanding considerations for participants regarding technology adoption. The environmental factors relevant to shaping the female SME owners' technology adoption in Turkey are cultural factors such as women's role in society and their domestic responsibilities, positive discrimination, which harms women in the entrepreneurship context, economic and financial factors and government support. The analysis provided valuable insights from participants that helped to answer the final sub-question: How can the Turkish government improve their support programs regarding the

technology adoption of female SME owners? Policymakers need to revise the policies regarding distribution, amount of support, content, and communication of programs.

This study shows that female SME owners' technology adoption in Turkey is shaped by a combination of individual and environmental factors. As suggested by the IDT, the interaction of these factors is different for each woman. However, this does not mean that women entrepreneurs' technology adoption processes cannot be improved by implementing inclusive policies. Government policies should see the entrepreneurship ecosystem as a whole and try to implement holistic policies instead of emphasizing concepts such as "positive discrimination" or "women entrepreneurs". Instead of seeing women's differences as weaknesses, the policies should approach them as valuable inputs since it was also seen in the findings that the distinctions of women can be their strength. This study shows that there are many women entrepreneurs with knowledge, confidence and resilience who could contribute to the economy to a great extent, and their maternal instincts and risk aversion do not necessarily put them in a disadvantaged position in terms of entrepreneurship.

Rather than simply comparing women with men, understanding the differences within them helps us to recognize their unique traits which are traditionally perceived as barriers to technology adoption and reposition them as their strengths. As role congruity theory suggests, women value communal goals, and they distance themselves from technology when they perceive it as not serving these goals. This can be observed in the participants of this study, as many women are interested in waste utilization technologies, food and laboratory technologies to carry out R&D for healthier food that serves communal goals, and they are passionate about it. Rather than seeing this as something that needs to be changed, women entrepreneurs should be empowered and steered to be the pioneers in areas such as green transition.

Adapting IDT, originally developed for women working in IT sectors, to the entrepreneurship context expanded the theory to include unique experiences of women entrepreneurs in technology adoption. The original theory highlights ethnicity, nationality, race, religion, and sexual orientation among individual identity factors, but none of these came up in this study. The country of focus may have also led to this since Trauth (2004) focused on the USA, which has very different demographics and culture than Turkey. Age, gender, family background, children, spouse, sector and type of technology are the common individual identity factors in both analyses. Regarding individual influence factors, both models recognise personal characteristics and perceptions towards technology, but Trauth's

model also emphasizes IT identity and gender identity. Technology adoption considerations of female entrepreneurs, such as cost-benefit balance, organization fit and networking as an important skill, are the main contributions of this study to the existing theory. Under environmental factors, relevant policies, societies' view of women, and economic conditions are emphasized by both models. This study provides information about government support programs for female entrepreneurs. Also, Trauth solely focused on the employment aspect of the economic factors while this study emphasizes inflation, uncertainty, and investment disadvantage of women, as factors specific to entrepreneurship. Organizational factors are the final contribution of this study to the existing theory. The most crucial factor is SME owners' numerous responsibilities, which become detrimental when combined with women's domestic responsibilities.

To sum up, policymakers should include women entrepreneurs in the policy-making processes, recognize the value of their input and allow them to do things their way. Including women entrepreneurs in policy-making will help address their unique challenges and discover their strengths to empower them, leading to more relevant policies. This can be done with the cooperation of institutions such as the Ministry of Industry and Technology and the Ministry of Family and Social Policies with foundations such as The Women Entrepreneurs Association of Turkey (KAGIDER). They are currently cooperating on a project basis, but including them in the deeper policy-making processes can be more beneficial in addressing the root issues of women entrepreneurs.

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Appendix A: Interview Questions – SME Owners

First of all, thank you for agreeing to meet with me. For my Master's thesis, I am conducting research on the technology adoption among female SME owners and in this context, I am interviewing with both women entrepreneurs and experts working in this field. In this respect, it is very important for me to learn your experiences and thoughts, and I hope that the results of the study will have positive effects for women entrepreneurs in our country.

The interview will take approximately 45-60 minutes to complete. Everything you share with me today will be kept strictly confidential and will only be used for research purposes. As the interview needs to be analysed thematically as part of the research, I would like to record the interview for ease of use. The recording will be deleted after the analysis is complete. Please note that there are no right or wrong answers. If you have any questions, please feel free to let me know at any time during the interview. You may refrain from answering any question without giving any reason. Before we start, I would like to ask you if you give me your permission to record this interview. Also, if you agree with the information in the consent form we shared with you beforehand, I would appreciate it if you could sign it and send it back to me.

OPENING QUESTIONS	1. Can you tell me a little bit about yourself?
	2. Can you tell me about your work history and your current work (what is your work history? what is the main field of work of the company, how long have you owned this company, what was your motivation when you started the company, what technologies do you use)
INTRODUCTION TO MAIN TOPIC	3. What comes to your mind when you hear the words technology, digitalization, technological transformation?
	4. How do you feel about technology in general?
	5. Can you tell me about the technologies you currently use for your business?
	6. Do you think your company should acquire and use new technologies? If yes, can you talk about them? If no, can you tell me why not (will be asked one by one)?
	7. Are you planning to acquire new technologies? If yes, can you tell me about these technologies?
CORE QUESTIONS -	8. What do you think about adopting new technologies?
	9. Do you have concerns about adopting new technologies?
	10. If yes, what is your biggest concern when considering adopting a new technology and why?
	11. Which of the processes of selecting/ acquiring (financing)/installing/implementing/using/learning how to use/maintaining appropriate technology is most critical for you and why?
	12. When you experience a problem in technology processes, from whom and where do you get help?
	13. Have you had a technology use experience that left an impression on you? If yes, why?

TECHNOLOGY ADOPTION CHALLENGES	14. What are the most important learning points, milestones for you when implementing a technology?
	15. If I was at the beginning of a new technology implementation process, what advice would you give me, what would you teach me?
	16. What do you think about your own skills and position in technology adoption?
POLICY ACTION QUESTIONS- GOVERNMENT SUPPORT	17. What kind of support do you receive as a woman entrepreneur (from your family, community, mentoring, childcare, etc.)?
	18. What can be done to improve and develop these supports?
	19. Have you participated in any government support programs and trainings on technology? If yes, can you tell us about your experience of participating in these programs?
	20. What can be done to improve these government support programs?
	21. What kind of government support do you think is most needed for women entrepreneurs' technology adoption processes and why?
CLOSING	22. Tell me a little about yourself, do you have children, how old are you, are you married, where do you live?
	23. How do you think being a woman affects your relationship with technology? Do you observe any differences between yourself and your male colleagues?
	24. Is there anything you would like to add?

Appendix B: Interview Questions – Experts

First of all, thank you for agreeing to meet with me. For my Master's thesis, I am conducting research on the technology adoption among female SME owners and in this context, I am interviewing with both women entrepreneurs and experts working in this field. In this respect, it is very important for me to learn your experiences and thoughts, and I hope that the results of the study will have positive effects for women entrepreneurs in our country.

The interview will take approximately 45-60 minutes to complete. Everything you share with me today will be kept strictly confidential and will only be used for research purposes. As the interview needs to be analysed thematically as part of the research, I would like to record the interview for ease of use. The recording will be deleted after the analysis is complete. Please note that there are no right or wrong answers. If you have any questions, please feel free to let me know at any time during the interview. You may refrain from answering any question without giving any reason. Before we start, I would like to ask you if you give me your permission to record this interview. Also, if you agree with the information in the consent form we shared with you beforehand, I would appreciate it if you could sign it and send it back to me.

OPENING QUESTIONS	1. Can you tell me a little bit about yourself? What is your educational background, age, etc.?
	2. Can you tell me about your current position and your work with women entrepreneurs?
INTRODUCTION QUESTIONS	3. Can you talk about the problems of women entrepreneurs in Turkey?
	4. What comes to your mind when you hear the words Technology and Digitalization?
CORE QUESTIONS- FEMALE SME OWNERS AND TECHNOLOGY ADOPTION	5. Can you tell me about your experiences and observations about women SME owners and their relationship with technology (which technologies do they use the most, which technologies do they have the most problems with?)
	6. Can you tell me about current or previous projects you have worked on related to women entrepreneurs and their adoption of technology and what these projects have taught you?
	7. Can you tell us about the problems they face when choosing/adopting/implementing/using technologies?
	8. In the literature, there are environmental and individual factors that affect women's adoption of technology. Individual factors are defined as more micro-level factors such as lack of confidence, computer literacy, unfamiliarity with technology, while environmental factors can be defined as external factors such as lack of

	funding, social norms that keep women away from STEM education, etc. In your experience, what affects women on an individual level? In your experience, what societal factors and policies are important for women's technology adoption?
POLICY ACTION QUESTIONS- GOVERNMENT SUPPORT	9. What kind of support do women entrepreneurs receive in Turkey? Is there family, social and government support or mentoring system?
	10. In which areas do you think women SME owners need the most support and why?
	11. In your opinion, what can be done to improve government support programs for women SME owners to adopt technology?
CLOSING	12. Is there anything you would like to add?

Appendix C: Overview of Interview Respondents – SME Owners

Participants	Age	Province	Sector	Marital status & Children	Education
Participant 1	55	İstanbul (Biggest metropole of Turkey- cosmopolite culture)	Food	Divorced 1 Adult daughter	University Education – Dental Technician
Participant 2	33	İzmir (Western, modern city in terms of gender equality)	Food	Single No kids	Food Engineer with Masters and continuing PhD
Participant 3	49	Gaziantep (Southeastern city- high industrial development low gender equality)	Food	Married 2 adult daughters	No high education
Participant 4	55	Kırklareli (smaller city in the west, modern but limited resources)	Textile	Married 1 adult daughter	Textile Engineer
Participant 5	50	İstanbul (biggest metropole of Turkey- cosmopolite culture)	Communication	Divorced 2 adult sons	University Education- Sociology
Participant 6	39	İstanbul (biggest metropole of Turkey- cosmopolite culture)	Food	Married 2 young children	Food engineer with master's degree
Participant 7	44	İstanbul (biggest metropole of Turkey- cosmopolite culture)	Food	Married 2 young children	Food engineer with PhD – Assistant professor in a university in addition to SME ownership
Participant 9	32	İstanbul (biggest metropole of Turkey- cosmopolite culture)	Food	Single No children	Industrial Engineer Continues Master Programme on Sustainable

					Agriculture and Food Systems
Participant 12	59	Ankara (Capital city fair economic development and gender equality)	Restaurant Sector Runs a small cafe	Widowed One adult son	No high education
Participant 14	45	Ankara (Capital city fair economic development and gender equality)	Communication Sector	Divorced 2 young children	University Education-Business Administration and Tourism
Participant 17	36	Ankara (Capital city fair economic development and gender equality)	Beauty Sector	Married 1 young daughter	No high education-vocational high school graduate
Participant 19	40	İstanbul (biggest metropole of Turkey-cosmopolite culture)	Textile Sector	Single	University Education-International relations - Masters in political philosophy and history-left PhD

Appendix D: Overview of Interview Respondents – Experts

Participants	Position	Education	Area of work	City
Participant 8	Digital system development manager	Automotive Engineer- Continues masters in Intelligent Systems Engineering	Provide consultancy support to SMEs (lean transformation digital transformation)	İstanbul (biggest metropole of Turkey- cosmopolite culture)
Participant 10	University Professor- Vice chancellor	Industrial Engineering	Experience with many women entrepreneurs, university- industry collaboration projects, digital transformation center project coordination unit member	Ankara (Capital city fair economic development and gender equality)
Participant 11	R&D Department Head of a textile manufacturers association – former expert in development agency.	Urban and regional planning	Works with SMEs in the textile sector	İstanbul (biggest metropole of Turkey- cosmopolite culture)
Participant 13	Team leader of an EU funded Women employment project that supports micro firms owned by women	Business administration	Application/ admission processes and monitoring of SMEs within the scope of project	Samsun (High industrial development low gender equality)
Participant 15	Operation manager of an EU funded Women employment project that supports micro firms owned by women	Psychology	Monitoring of SMEs within the scope of project	Şanlıurfa (Low economic development and gender equality)
Participant 16	Operation manager of an EU funded Women employment project that supports micro firms owned by women	Economics/Agricultural Engineer and PhD in Agricultural Engineering	Monitoring of SMEs within the scope of project	Samsun (High industrial development low gender equality)

Participant 18	Team leader of an EU funded Women employment project that supports micro firms owned by women	Philosophy - Masters in disaster management-PhD in Management and Organization	Application/ admission processes and monitoring of SMEs within the scope of project	Aydın (Western city but very small and limited resources)

Appendix E: Code Tree

FACTORS AFFECTING FEMALE SME OWNERS' TECHNOLOGY ADOPTION

INDIVIDUAL INDENTITY FACTORS

PERSONAL IDENTITY
- Family Support
- Age
- Informal & Friend Support
- Socio-economic Background

PROFESSIONAL IDENTITY
- Type of Technology
- Sector

INDIDIVDUAL INFLUENCE FACTORS

CHARACTER
- Confidence
- Risk Aversion
- Personal Disposition to Technology
- Openness to Learning

PERCEPTION OF TECHNOLOGY
- Negative Perception
- Positive Perception

SKILLS
- Networking
- Information Access
- Financial Engagement
- Computer Literacy
- Education

TECHNOLOGY ADOPTION CONSIDERATIONS
- Cost-benefit balance
- Organization fit
- Sustainability
- Integration Challenges
- Cheaper versions of technologies emerging constantly
- Training of employees

ENVORONMENTAL FACTORS

CULTURAL
- Women's role in Society
- Societal Expectations of Women's Domestic Roles
- Positive Discrimination

ECONOMIC & FINANCIAL
- Economic factors
- Financial factors

GOVERNMENT SUPPORT
- Financial Support Amounts
- Limited Communication
- Distribution of government support
- Lack of trust
- Content and structure of programs

ORGANIZATIONAL FACTORS
- Too many responsibilities
- Difficulty in finding skilled employees
- Scalability
- Outsourcing