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Digital Services and the Elderly: Practices, Challenges, and Strategies

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Abstract This research seeks to understand the position of elderly individuals in the digitalization process by using the concepts of the digital divide, digital immigrant identity, and digital capital. This study investigates how these individuals engage with digital services, the nature of their usage patterns, the primary challenges they face, the influence of such services on their everyday lives, their adaptation to digital technologies, and the coping strategies they employ in response to their disadvantaged situations. The study specifically explores the experiences of 46 individuals aged 65 and above in Ankara, Turkiye, who use e-health, e-government, and digital banking services. A qualitative methodology was adopted, and the participant group comprised elderly individuals living in Ankara who had used at least one of the aforementioned services. The data for the study were collected via semi-structured interviews with these participants. These interviews were analyzed using the MAXQDA24 software through descriptive analysis for a detailed evaluation. The research findings point out the factors affecting the ability of elderly individuals to engage with the digital world, which is closely linked to their level of digital capital and, in turn, shapes both their strategies of adaptation and their risk of exclusion from digital services. Findings reveal that low levels of digital capital can hinder elderly individuals' ability to use digital services effectively, often leading them to rely on help from their immediate social networks. The findings of the study also point out that the COVID-19 pandemic significantly contributed to the digital adoption of older adults, fostering improvements in digital literacy, though often dependent on social support networks.

Keywords digitalization · aging · digital capital · digital fear · age-related digital divide

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Digital Services and the Elderly: Practices, Challenges, and Strategies

According to population projections, the world population is aging, and digital technologies are rapidly advancing. Therefore, the integration of the elderly population into digital technologies is a highly significant issue. In this context, the study examines the integration of elderly individuals into digital technologies, their strategies for integration of these technologies, and their experiences in using these technologies, within the framework of the digital divide and digital capital concepts. In this respect, the study investigates the experiences of the elderly population in Turkiye within the framework of three digital services: e-government, e-health, and digital banking services. This study explores elderly individuals' strategies for using these digital services, the challenges they face while doing so, and the solutions they develop to address these challenges. Additionally, it examines their level of knowledge and skills regarding these services, how they develop these skills, and the practices and strategies they develop to overcome the difficulties they encounter in the integration process. The research was conducted using a qualitative method. The study is based on data obtained through semi-structured interviews with individuals over the age of 65 residing in Ankara.

Due to age-related factors, older adults may be exposed to the digital divide, which is often linked to their low levels of digital capital. For this reason, the elderly, often referred to as "digital immigrants" in some studies, may find themselves at a disadvantage due to their age and the era in which they grew up. The services examined in this study (e-government, e-health, and digital banking) provide essential functions for elderly individuals. Particularly with the onset of health and physical challenges associated with aging, these digital services play a crucial role in enabling older adults to sustain their social participation. The findings of the study suggest that elderly individuals who are reluctant to engage with digital services may eventually find themselves compelled to do so. Using these services offers advantages such as saving time and eliminating dependence on physical spaces, while also providing solutions to problems that may be difficult to resolve in person due to age-related health issues. The results of the study show that elderly individuals may seek assistance from their close social circles to overcome disadvantages such as hesitation in using digital services or a lack of sufficient digital skills, thereby striving to integrate into digital services. The concepts of the digital divide and digital capital, as discussed in the literature, are particularly significant for understanding the integration of elderly individuals into digital technologies.

Methodology

The study covers e-government, e-health, and digital banking services and is limited to individuals aged 65 and older who use these services. Participants were selected using the criterion sampling method. While forming the participant group, the criterion applied was that individuals must be registered in at least one of the e-government, e-health, or digital banking applications in Turkiye. However, if the participant was registered for at least one of these applications but did not personally use the service, they were still included in the sample. In other words, the inclusion criterion was that the participant had registered for at least one of these services, even if they did not personally use them. In that case, a relative or another individual accessed the services on their behalf.

The reason for selecting the sample in this manner was that the study also aimed to determine why some individuals registered for a service but did not use it by themselves. Thus, individuals who were registered but did not personally use these applications were included in the sample, allowing for an analysis of

the differences in service usage practices and identifying those who assisted them in using these services. Ethical approval for the study was obtained from the related Ethics Committee.

A total of 48 individuals were interviewed in the study; however, the data of 2 participants were excluded since they did not provide information relevant to the scope of the research. Accordingly, data from 46 participants were used in the study. The reason for concluding the interviews with 46 participants was the attainment of data saturation. Data saturation is recognized as a methodological principle in qualitative research and is rooted in the works of Glaser and Strauss. According to these two researchers, data saturation refers to the point at which no new information can be obtained that would add further depth or value to the research content. When researchers repeatedly encounter the same patterns in the sample, they state that continuing data collection becomes unnecessary and that saturation has been reached (Glaser & Strauss, 1967, p. 61). During the interviews, data saturation was achieved as recurrent patterns and themes consistently emerged, and additional interviews did not provide new information that could contribute further depth or value to the analysis. This point indicated that the data collection process had sufficiently captured the range of the participants' experiences. During the research process, the following questions were asked in the semi-structured interviews, such as participants' experiences with digital tools in daily life, their use of e-government and e-health applications, and the challenges they encountered.

When examining the demographic data of the participants, it was observed that there were 26 male and 20 female participants. The participants' ages ranged from 65 to 78. Their educational levels are as follows: 1 participant is illiterate, 3 participants are literate without formal schooling, 12 completed primary school, 6 completed middle school, 17 completed high school, 5 hold a bachelor's degree, 1 holds a master's degree, and 1 holds a doctorate. Among the participants, 29 were retired while 17 were not. Some of the non-retired participants are waiting for retirement, while others have never had any work experience. All participants without work experience are women. Regarding marital status, 33 participants were married, 6 were divorced, 5 were widowed, and 2 were single. Only 4 participants do not have children, while the rest were parents.

The research seeks to answer the following questions regarding the elderly population's experiences with digital technologies and their usage strategies:

- How do elderly individuals perceive and make sense of the digitalizing world based on e-government, e-health, and digital banking services?

- What are the knowledge and skill levels of elderly individuals regarding these services?

- What is the usage status of elderly individuals concerning e-government, e-health, and digital banking services?

- What positive and negative experiences do they encounter while using these services? How do they develop solutions and strategies to address these challenges?

- How do these services impact the daily lives of the elderly?

- How do elderly individuals improve their knowledge and skill levels regarding digital technologies?

The qualitative research method was employed in this study. The semi-structured interview technique was used as the data collection method. After data collection, the data were transferred to a digital platform, reviewed, and analyzed by identifying key themes. The coding process followed Corbin and Strauss (2014) method of open, axial, and selective coding. Open coding was used to determine themes and concepts, axial coding related themes to subcategories, and selective coding integrated themes with theoretical and conceptual frameworks. The data were analyzed using the MAXQDA24 qualitative data analysis software.

After data analysis in MAXQDA24, hierarchical code-subcode models, frequency distributions, and proximity analysis were used to determine the relationships between subcodes. Finally, a descriptive analysis was employed to interpret, define, and identify the relationships between codes and subcodes.

The Digital Divide and Digital Capital in the Context of the Age

With the acceleration of the digitalization process and the widespread adoption of digital transactions by individuals, various conceptual debates have emerged. One of these conceptual discussions is the "digital divide". The digital divide refers to the gap between individuals or communities with access to information and communication technologies and those without such access (O'Hara & Stevens, 2006, p. 70; Jessamyn, 2011, p. 24; Parks, 2013, p. 23). The concept not only includes internet access or participation in the digital sphere but also encompasses access to information technologies (IT), covering a broad area. This concept was first used in some newspapers in the United States in 1995. However, the data that played a role in the emergence of the concept were based on the findings in the report *Falling Through The Net: A Survey of The "Have Nots" in Rural And Urban America*, published by the National Telecommunications and Information Administration (NTIA) (Servon, 2002, p. 2; Dijk, 2020, p. 1). According to this report, the poor in central cities and those in rural areas were at a disadvantage in terms of information technology usage (National Telecommunications and Information Administration, 1995). In 1998, the second edition of this report was published, and the term "digital divide" was included. This report also emphasized variables such as income level, race, education level, urbanization, and age (National Telecommunications and Information Administration, 1998).

In the early years of digital divide research (1999-2002), the concept was primarily defined in terms of access issues. The type of access referred to here was usually physical access, meaning whether individuals could obtain digital media tools and access the internet. However, in later years, the focus shifted beyond access, considering factors such as user skills, different ways of using the internet, and complexities of access (Dijk, 2017).

Discussions in the literature regarding the digital divide are categorized into three levels. The first-level digital divide, which primarily includes arguments from the early years of the concept, focuses solely on internet access or material access (Deursen & Dijk, 2018). In subsequent years, this discussion deepened, and studies examining how the digital divide should be defined began to consider inequalities in the technical skills needed to use information and communication technologies effectively. This was categorized as the second-level digital divide (Dimaggio, Hargattai, Celeste & Shafer, 2004; Selwyn, 2006; Zillien & Hargittai, 2009). Unlike the first and second levels, the third-level digital divide categorization refers to the ability to mobilize digital resources toward a specific goal. In other words, users with the same equipment may not derive the same benefits from technology usage (Aissaoui, 2021).

There are several key factors that determine the digital divide. These factors include individual access and regional infrastructure conditions (Lent & Oden, 2001; Meng & Li, 2002; Huang & Russel, 2006; Habler & Jackson, 2010; Riddlesden & Singleton, 2014), income level and socio-economic status (Martin, 2003; Martin & Robinson, 2007; Fuchs, 2009; Wong et al., 2015), skills and knowledge levels (Hargittai, 2001; Dijk, 2006; Deursen & Dijk, 2010; Scheerder, Deursen & Dijk, 2017; Youssef, Dahmani & Ragni, 2022), rural-urban differences (Furuholt & Kristiansen, 2007; Fong, 2009; Wang, 2013; Thoma, 2023), education level (Robinson, Dimaggio & Hargittai, 2003; Cruz-Jesus et al., 2016; Purba & Hutabarat, 2022), family structure and marital

status (Demoussis & Giannakopoulos, 2006; Notten et al., 2009; Friemel, 2016), and gender (Abu-Shanab & Al-Jamal, 2015; Amber & Chichaibelu, 2023; Antonio & Tuffley, 2014; Brannstrom, 2012; Cooper & Kugler, 2009).

A considerable digital divide may exist between generations born in a time when information and communication technologies (ICT) were either non-existent or not widespread and those born into a world where these technologies are deeply integrated. The increasing aging population and the widespread adoption of information technologies further emphasize the significance of the age-related digital divide. In this regard, numerous studies have examined the age-related digital divide (Abbey & Hyde, 2009; Antonio & Tuffley, 2015; Bercovitz & Pagnini, 2016; Enoch & Soker, 2006; Loges & Jung, 2001; Mubarak & Suomi, 2022; Neves, Waycott & Malta, 2018; Niehaves & Plattfaut, 2014).

The challenges elderly individuals face in accessing the internet and ICT are generally referred to in the literature as the "gray digital divide." The concept of the gray digital divide was first introduced by Peter Milward (2003) to describe the exclusion of elderly people from the internet, the existence of age-related barriers to internet access and low internet usage rates among the elderly. Various studies have examined the causes of this phenomenon, identifying factors such as lack of motivation, feeling too old to learn new skills, fear of technology, inability to access ICT, lack of e-literacy skills, unwillingness to engage with the internet, concerns about security and privacy, and physical disabilities that hinder the ability to use computers (Morris, 2007, pp. 10-11).

The primary factor here is not just age; being elderly with a low level of education can contribute significantly to digital inequality and intensify the extent of this divide. Additionally, low income is another critical factor, serving as a limiting condition. The decline in cognitive abilities with aging is another contributor to the gray digital divide, and for this reason, developing user-friendly applications designed for the elderly is recommended (Huxhold, Hees & Webster, 2020, p. 277; Lagace et al., 2016, p. 73). According to Huxhold et al. (2020, p. 277), social contagion (i.e., the spread of certain behaviors through contact within a group) is an essential mechanism for overcoming the age-related digital divide or, in other words, the gray digital divide. They argue that elderly adults who spend time with their grandchildren are more likely to access the internet than their peers of the same age, regardless of their education, income, or cognitive abilities.

Another factor affecting the gray digital divide is whether individuals used the internet and ICT before retirement (Gilleard & Higgs, 2008; Peacock & Künemund, 2007). Prior experience with ICT before retirement can help reduce the age-related digital divide after retirement. Individuals who used computers before retirement are significantly more likely to continue accessing the internet compared to those who did not. However, this effect is more pronounced among younger elderly individuals and may not be as significant for older individuals (Friemel, 2016, p. 326).

Aging is also associated with a phenomenon known as digital fear in the use of ICT. This issue, sometimes referred to in the literature as cyber-paranoia, describes the fear individuals experience when using ICT. Digital fear, which may arise due to factors such as age, gender, or low digital literacy, can impact individuals' participation in ICT. Digital fear or paranoia tends to increase with age while decreasing with greater exposure to digital technology and information. What differentiates these fears and paranoia from general paranoia is their clinical distinctiveness, as they stem from the internet and other technology-related sources (Mason, Stevenson & Freedman, 2014, p. 5).

When analyzing the impact of age on the digital divide, it becomes evident that the gap arises due to elderly users' lower level of digital technology skills. In this regard, the concept of digital capital, which stems from Pierre Bourdieu's capital theory, plays a significant role. The first concept related to digital capital within

a Bourdieu-inspired framework was "information capital." According to Cees J. Hamelink (2000), who introduced this term, suggested that a new category of capital, information capital, should be added to Bourdieu's classification of capital types. Information capital includes the financial capacity to pay for network usage and information services, the technical competence to utilize network infrastructures, the ability to filter information, the capacity to evaluate these activities, and the ability to transform acquired information into social practices. Similar to other types of capital, information capital is unequally distributed among social classes. Hamelink argues that large-scale educational and awareness-raising activities are necessary for a more equitable distribution of information capital (Hamelink, 2000, p. 91).

According to Dijk (2005), the concept of information capital encompasses financial resources allocated for ICT, skills for using ICT, motivation to acquire information, and the capacity to apply this knowledge (Dijk, 2005, p. 72). Witte and Mannon (2010, p. 73) also emphasized that internet competency serves as an indicator of cultural capital. They argue that knowing how to use a search engine or open a browser extension are examples of competencies that reflect cultural capital.

Robinson (2009), in his study on digital inequalities, attempts to explain the issue from a Bourdieu-inspired perspective through the concept of "information habitus." In his research on young individuals from more and less privileged backgrounds, Robinson finds that the level of privilege influences not only digital skills but also different orientations toward internet use. In other words, individuals with high-quality internet access tend to engage with the internet differently from those without such access. Robinson argues that these differences in access create two distinct information habitus: "playing seriously" and "developing a taste for the necessary." High-quality access leads to an exploratory and game-oriented habitus, fostering a positive attitude toward global information seeking and enhancing detailed information search skills. In contrast, individuals with low-quality access, due to experiences of deprivation and urgency, are more task-oriented in their information searches. Robinson suggests that this group, due to digital inequalities, intensifies skill disparities even further (Robinson, 2009, pp. 504-505).

Digital capital, like economic and cultural capital, can be considered a secondary form of capital that differs from primary capital types. Within this framework, an individual's digital capital is evaluated based on their online behaviors (Ignatow & Robinson, 2017, pp. 952-953). From this perspective, digital capital can be seen as a bridge between online and offline life. The real benefits of internet usage depend on users' prior capital and digital capital, as well as their interactions during and after online experiences. Digital capital is based on digital activities such as time spent online, the information found, resources acquired, skills developed, and types of activities carried out. These online activities can then translate into social resources such as better job opportunities, higher salaries, larger social networks, and increased knowledge (Ragnedda, 2018, p. 2367). According to Park (2017, p. 27), "*digital capital is a predetermined set of dispositions that influences how people engage with digital technology.*" The presence of digital capital indicates an individual's ability to use digital technologies to achieve their goals. At the core of digital capital lies the potential to use available resources to create value. Individuals with digital capital, even if they lack digital literacy, can quickly adapt to new digital devices. While the presence of digital capital facilitates the efficient acquisition of digital literacy, individuals with insufficient digital capital may struggle to reach the desired level of digital skills.

From a generational perspective, it is also essential to address the concepts of "digital natives" and "digital immigrants". Marc Prensky (2001), who first introduced the concept of digital natives, discussed these terms in the context of the education system. According to Prensky, there are two distinct groups within the

educational environment: digital natives and digital immigrants, each differing in their methods of accessing information. In this regard, the group defined as digital immigrants is characterized by its inability to fully adopt new technologies and its unfamiliarity with the ways in which digital natives acquire information. When examining the differences between digital natives and digital immigrants, digital immigrants tend to use limited resources to access information, focus on single tasks rather than multitasking, prefer text-based teaching methods, and value delayed gratification and rewards. In contrast, digital natives are more visually oriented than text-focused, prefer interactive and network-based learning models, seek immediate gratification and rewards, and enjoy acquiring instantly applicable information (Fenley, 2010, p. 77).

When the concept of the digital divide first emerged, it primarily referred to access to digital technologies. However, over the years, it has become evident that the scope of this concept is much broader. In this context, the ability to use digital technologies has also been recognized as a significant dimension. Accordingly, the elderly population, frequently characterized as a disadvantaged group in terms of digital skills and described as digital immigrants in some studies, has emerged as a key component of the age-related digital divide. The integration of elderly individuals, who typically possess low levels of digital capital, into digital technologies has become a significant challenge today. Age-related digital inequality, as one of the various forms of inequality experienced by individuals, along with the associated low levels of digital capital, has prompted research on how elderly individuals can be integrated into digital technologies. Additionally, understanding the position of the elderly population within the context of digital technologies has been a key focus in these studies. Such research has become a topic of interest not only within academic circles but also in policy-making processes, as making digital technologies inclusive for all segments of society and eliminating existing inequalities are crucial goals.

Findings

Determinants of Digital Engagement Among the Elderly: Experiences, Barriers, and Adaptation Strategies

The disadvantages that emerge with aging in terms of digital technology integration can significantly influence device preferences. Among the participants, 16 individuals use only smartphones, 17 use both smartphones and computers, and 5 use smartphones, computers, and tablets. Only one participant uses both a smartphone and a tablet, while one uses only a computer, and another only a tablet. Six participants prefer button-operated (non-smart) phones instead of smartphones, and one of them performs their digital transactions using a tablet, while another does so using a computer. One participant stated that she only uses a landline telephone. The reason these participants were not excluded from the study is that they still access the digital services within the research scope with the help of the people around them.

Participants who do not use smartphones, tablets, or computers but rely on button-operated phones and delegate their digital transactions to their close circle manage to access digital services through intermediaries. Examining P1, P18, P28, and P36, it appears that their preference for button-operated phones is linked to a lack of digital capital and digital experience. P1 and P18's reason for using button-operated phones is that they only expect their devices to provide communication and allow them to receive instant updates from their contacts, like P9. Meanwhile, P28 and P36 initially attempted to learn how to use new-generation smartphones but ultimately could not succeed and reverted to using the familiar device. This suggests that continuing to use button-operated phones and failing to transition to new-generation devices are primarily related to age and generational differences. Indeed, the older generation, who are considered

digital immigrants (Prensky, 2001), confirm this situation through their tendency to prefer phone or face-to-face communication, as noted by Zur and Zur (2011). While some participants associate disinterest in the possibilities offered by new-generation smart devices with their age, others express frustration over their inability to develop new skills despite their efforts. Their statements, such as *"Why would I need it?"*, *"I don't understand"*, *"We don't know these things, we couldn't learn"*, and *"My daughter taught me once, but I couldn't grasp it."* highlight the presence of generational differences and age-related variations in digital skills.

In the study, it was observed that some participants initially used smartphones but later abandoned them, while others who did not use smartphones still conducted their digital transactions via computers or tablets. Participants who fulfill their communication needs with button-operated phones handle their other digital transactions via computers or tablets. The following section presents the participant experiences regarding avoiding using smartphones:

"My phone is a button-operated phone. I cannot handle a smartphone, that's why I don't want one. With the tablet, I just wander around here and there on my own. Sometimes I end up in places I don't know, I get scared and close it. Honestly, there are so many scammers, I'm terrified I will get scammed. We hear about it on TV every day" (P2).

"I've been using a computer for 15 years, but I still use a button-operated phone. A smartphone's battery runs out every two hours. I cannot deal with that. I charge my own phone, and it lasts for ten days" (P15).

The findings of this research reveal that a significant factor in the increase of digital capacity and digital capital levels among individuals aged 65 and above was the COVID-19 pandemic. Some participants stated that the pandemic motivated them to start using digital services such as e-health and digital banking, which they had previously considered unnecessary. Elderly individuals who did not require services such as e-health, digital banking, or e-commerce before the pandemic were compelled to use them due to lockdown measures. However, some participants struggled to use these applications due to insufficient digital capital. Similarly, Martins Van Jaarsveld (2020) ve Mubarak ve Suomi (2022, p. 4) highlights that during the COVID-19 pandemic, older adults were forced to adopt digital technologies; however, due to insufficient digital literacy, a segment of this population could not benefit from the digital measures implemented. This phenomenon is very evident in the accounts of P13 and P43, who mentioned that they had to conduct their banking transactions online because they could not go outside. However, they also acknowledged that this was beneficial in terms of their health and found it quite useful during that period. Similarly, P34 stated that he registered for the e-health system to track vaccinations during the pandemic and continued using the service afterward, finding it useful. The use of e-health applications, which became available during the pandemic, played a crucial role in maintaining daily life. However, the findings indicate that this use was often sustained in the context of digital care, with elderly individuals relying on support from their close social networks. Similarly, Carlo and Nanetti (2024, p. 67) concluded in their study that older adults who could not integrate into digital technologies managed complex digital services mostly with the support of family members and were therefore only formally included in the digital world. Examining the participants' narrative, it is evident that the mandatory use of these services during the pandemic continued even after the pandemic ended. This finding suggests that their digital literacy levels have increased. In a similar vein, Martínez-Alcalá et al. (2021) found that older adults progressively improved their digital literacy during the COVID-19 pandemic and eventually took a step into the digital age.

Another key factor influencing digital capacity and technological skills is whether an individual's past occupation was related to digital systems. There are studies in the literature claiming that individuals who worked in jobs requiring computer skills before retirement are less affected by the age-related digital divide (Gilleard & Higgs, 2008; Peacock & Künemund, 2007; Friemel, 2016). The data revealed that individuals who had previously worked in jobs requiring computer use integrated more easily into digital technologies and, in some cases, encountered no difficulties at all.The experiences gained during employment facilitated a smoother adaptation to digital technologies in post-retirement life. For instance, P10, who still works as a senior executive in an organization, stated that his job is entirely computer-based. As a result, he does not need assistance with his digital tasks and even helps his spouse and children with their digital transactions. Similarly, P11, a retired administrator, continued using computers and never abandoned the familiar device. They also mentioned that their computer familiarity made it easier for them to use other devices in old age. P24, another participant with past experience using computers for work, independently handles his e-government and digital banking transactions, although he does not use e-health applications.

However, P45 presents a different case: although he used computers at work and still continues to use them, he remains hesitant about mobile applications. P45 does not prefer to handle his e-government, e-health, and digital banking transactions personally, delegating them to his son instead. Nonetheless, this participant actively uses his computer for entertainment, such as watching YouTube and digital movie platforms. This case suggests that P45 continues to maintain her digital capital through computer use, but he has not fully adapted to smartphones, indicating a partial lack of adaptation to newer digital tools.

On the other hand, the opposite scenario was also observed in the study. Some participants reported that they retired earlier due to the introduction of computers in their workplace. This indicates that fear of digital technologies or concerns about learning them influenced career decisions among some digital immigrants. For example, P29, a retired employee, stated that the requirement to use a computer in his department led him to opt for early retirement. The obligation to attend computer training courses and learn to use digital tools was a decisive factor in his retirement decision.

Looking at the digital capacities of participants, the results of the study show that while they developed digital capital in certain areas (such as entertainment), their competency levels were insufficient in relation to the digital services covered in the study (e-health, e-government, and digital banking). While participants are willing and inclined to develop their digital capital in certain areas, they do not exhibit the same inclination in others. Specifically, participants appear to be trying to enhance their digital capital in areas such as social media, instant communication, seeking help for daily tasks, and following religious content. However, in e-health, e-government, and digital banking services, which are the focus of this study, their digital capital remains low, leading them to seek assistance from others.

From this perspective, participants do not hesitate to use digital technologies for social media and leisure activities, likely because they experience less fear regarding these functions. However, participants who expressed serious concerns about public services and banking transactions tend to seek help from their more digitally proficient relatives, who are considered digital natives, when they need to use these services.
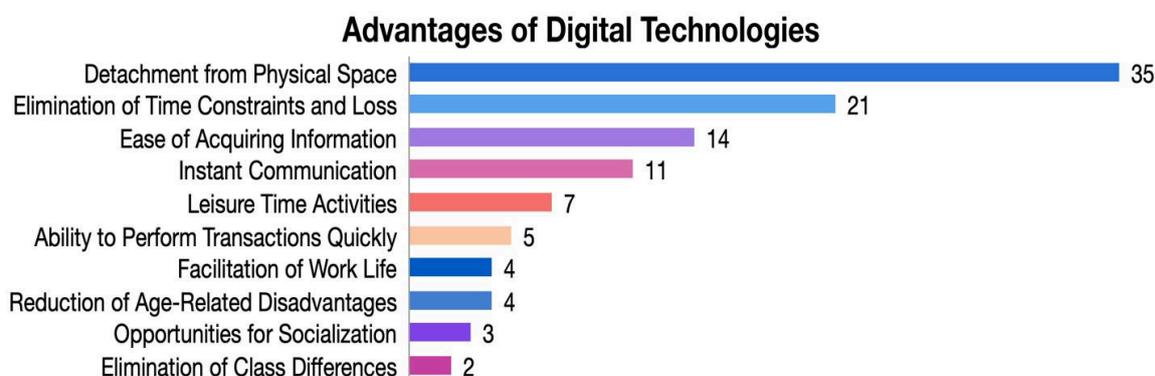
Reasons for Using Digital Technologies

A theme identified in the study is the perceived advantages of digital technologies for the participants of the study. In this context, depending on their level of digital capital, the participants' perspectives on how digital technologies impact their daily lives and their opinions about these effects were analyzed. The

frequency distribution of the advantages of digital technologies, based on the hierarchical code-subcode model created using MAXQDA24, is presented in Graph 1.

Graph 1

Frequency distribution of hierarchical subcodes related to the perceived advantages of digital technologies

Advantages of Digital Technologies

Detachment from Physical Space	35
Elimination of Time Constraints and Loss	21
Ease of Acquiring Information	14
Instant Communication	11
Leisure Time Activities	7
Ability to Perform Transactions Quickly	5
Facilitation of Work Life	4
Reduction of Age-Related Disadvantages	4
Opportunities for Socialization	3
Elimination of Class Differences	2

As shown in Graph 1, 10 subcodes were identified under the theme of digital technology advantages. These subcodes are as follows: detachment from physical space, ease of acquiring information, elimination of time constraints and loss, instant communication, leisure time activities, ability to perform transactions quickly, facilitation of work life, reduction of age-related disadvantages, opportunities for socialization, and elimination of class differences.
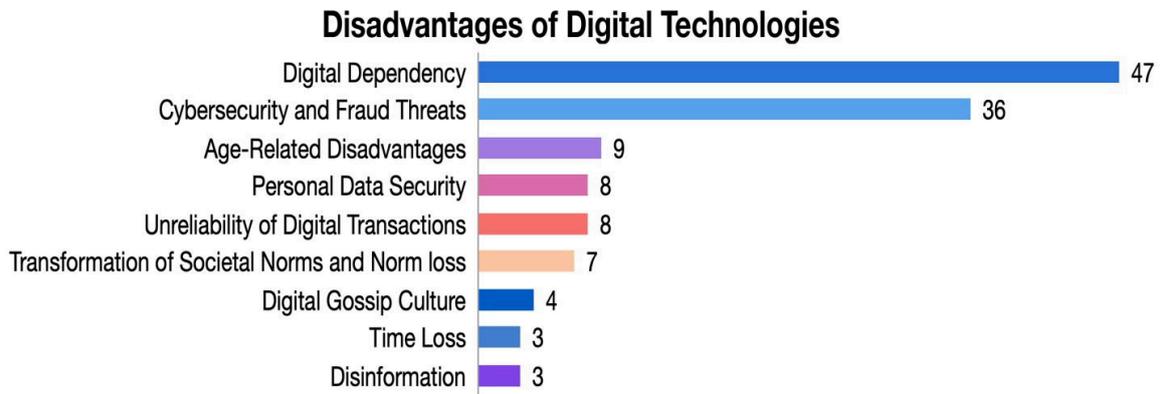
Examining the frequency of these subcodes, the most emphasized advantage is detachment from physical space, which was mentioned 35 times. This subcode highlights how digital technologies eliminate the disadvantages caused by physical limitations. The second most emphasized advantage, with 21 mentions, is the elimination of time constraints and loss, indicating the ease of completing desired transactions at any time. The third most frequent subcode is the ease of acquiring information, which was mentioned 14 times. Another prominent subcode, with 11 mentions, is instant communication. Other advantages of digital technologies include: leisure time activities (7 mentions), ability to perform transactions quickly (5 mentions), facilitation of work life (4 mentions), reduction of age-related disadvantages (4 mentions), opportunities for socialization (3 mentions), and elimination of class differences (2 mentions).

Perceived Disadvantages of Digital Technologies

Another theme identified in the research is the negative aspects of digital technologies from the perspective of the participants. While participants discussed the advantages of digital technologies, they also mentioned the drawbacks and dangers associated with them. In this context, understanding the types of disadvantages that digitalization has created for them and the potential risks they face is crucial. Therefore, this theme holds significant importance in analyzing their experiences. Accordingly, the frequency distribution of the disadvantages of digital technologies, based on the hierarchical code-subcode model created using MAXQDA24, is presented in Graph 2.

Graph 2

Frequency distribution of hierarchical subcodes related to the perceived disadvantages of digital technologies

Disadvantages of Digital Technologies

Category	Value
Digital Dependency	47
Cybersecurity and Fraud Threats	36
Age-Related Disadvantages	9
Personal Data Security	8
Unreliability of Digital Transactions	8
Transformation of Societal Norms and Norm loss	7
Digital Gossip Culture	4
Time Loss	3
Disinformation	3

Graph 2 presents the hierarchical code-subcode model related to the disadvantages of digital technologies based on the research findings. A total of 9 subcodes were identified under the theme of digital technology disadvantages. These subcodes are digital dependency, cybersecurity and fraud threats, age-related disadvantages, personal data security, unreliability of digital transactions, transformation of societal norms and norm loss, digital gossip culture, time loss, and disinformation.

Examining the frequency of these subcodes, the most emphasized disadvantage is digital dependency, with 47 mentions. Digital dependency refers to the need for individuals classified as digital immigrants to seek assistance in using digital technologies due to low levels of digital capital, as they were born in an era when digital technologies were not widespread. The second most mentioned subcode is cybersecurity and fraud threats, with 36 mentions. A significant portion of the participants expressed concerns about cybersecurity and fraud. These two subcodes alone account for 67% of the total mentions. Following these, age-related disadvantages were mentioned 9 times, personal data security and unreliability of digital transactions were each mentioned 8 times, transformation of societal norms and norm loss was noted 7 times, digital gossip culture was mentioned 4 times, time loss, and disinformation were each mentioned 3 times.

Figure 1

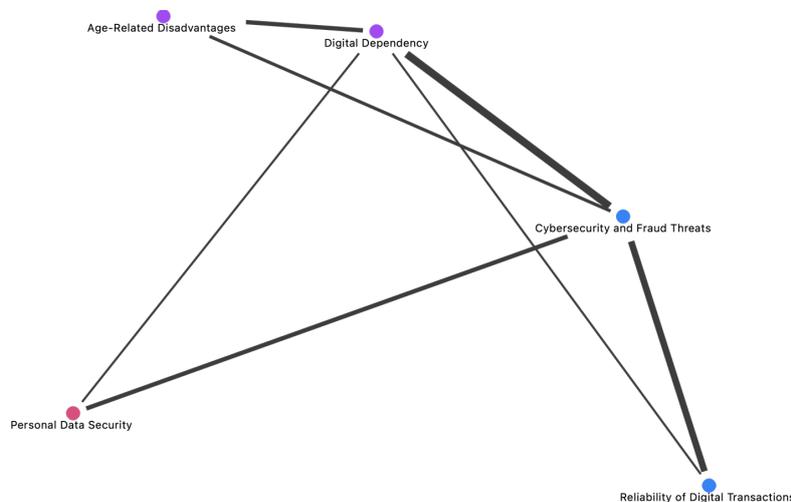*Proximity analysis of hierarchical subcodes related to the disadvantages of digital technologies*

Figure 1 illustrates the proximity of codes related to the disadvantages of digital technologies. In the proximity analysis, the subcodes of transformation of societal norms and norm loss, digital gossip culture, time loss, and disinformation were found to have no significant relationship with other codes and were therefore excluded from the analysis. Examining Figure 1, a high degree of proximity is observed between digital dependency and cybersecurity/fraud threats, indicating a meaningful relationship between these two codes. One of the reasons for digital dependency is the concern among participants about cybersecurity and fraud risks. This relation indicates that individuals aged 65 and above who feel insecure about cybersecurity threats tend to seek help from their relatives, essentially forming a security strategy.

A strong relationship is also found between cybersecurity concerns and the unreliability of digital transactions, as participants experience uncertainty regarding the security of digital transactions due to cybersecurity threats. This aligns with what is described in the literature as "cyber-paranoia," which refers to the fear individuals experience while using information and communication technologies (Mason, Stevenson & Freedman, 2014, p. 5). Additionally, there is a notable proximity between digital dependency and age-related disadvantages, suggesting that for the participants, digital dependency is an age-related phenomenon.

Similarly, there is also a proximity between cybersecurity/fraud threats and personal data security, indicating that participants primarily perceive cybersecurity threats as risks to their personal data. The findings of the research indicate that digital dependency is one of the main reasons participants find themselves in a disadvantaged position in digital platforms. To mitigate their disadvantages, individuals experiencing digital dependency seek help from trusted relatives, typically younger family members classified as digital natives (Prensky, 2001) in the literature. Digital dependency emerged as the most frequently expressed disadvantage, and participants consistently mentioned related concerns in their statements.

The findings reveal a prevailing digital anxiety among the participants. The underlying cause of this is their lack of digital capital, which leads to digital dependency. This results in digital immigrants relying on others for information or delegating authority for digital transactions. Delegation of authority refers to digital immigrants assigning trusted individuals, allowing them to perform digital transactions on their behalf. The following section presents participant experiences exemplifying this phenomenon:

I always let my daughter handle my e-government transactions. I first went to the post office to get my initial password, then I gave it to my daughter, and she did everything. I know my password, but I cannot log in myself. My daughter checks our property records there. She handles inheritance transactions, and we sell the properties. When e-Government was introduced, my daughters got a password for me too. I trust my daughter very much; she knows these things. She would never spend my money without my knowledge. She even shows me everything on the tablet. I cannot use e-Government, son; I'm afraid I might click on something wrong. That's why my daughter does it—I just cannot. I would panic, fearing I might make a mistake. Everyone is getting scammed these days; even lawyers are being deceived. If I tried, I would have been scammed long ago. (P5)

"I use it very poorly". I always need help from others. Of course, these are people I trust deeply. Whenever necessary, I ask my sister, niece, or trusted colleagues at work for help. I just cannot manage it myself. I guess I'm a bit digitally disabled. Honestly, I'm afraid of making a mistake. What if I do something wrong? I look at everything with suspicion. (P12)

Examining P5's statements, it is evident that although he initially obtained his e-government password himself, he later appointed his daughter as a proxy to handle transactions. P5 experiences digital dependency, relying on his trust in his daughter to feel secure regarding digital transactions conducted on his behalf. However, when he is required to perform these transactions himself, he experiences fear, which is fundamentally rooted in a lack of digital capital. Similarly, P12 explicitly states her low level of digital capital, as seen in her statement: "*I use it very poorly. I always need help from others.*" Like P5, P12 only seeks digital assistance from trusted individuals. Moreover, her self-description as "digitally disabled" reveals a highly negative perception of her own digital competence. One of the underlying reasons for P12's digital dependency, similar to P5, is digital fear.

However, P3 shares an experience in which she initially faced digital dependency when first using digital services, but later, as she became more familiar, she no longer required assistance.

"I have my mentors with me (my former daughter-in-law and my grandchild). They taught me. At first, they showed me, and then I learned. I usually asked them about everything. I still do. (P3)"

The same situation applies to P35, but she stated that constantly seeking help from others eventually made her uncomfortable, leading her to stop asking for assistance.

When I first started, I didn't use it at all—I always relied on them. Then I thought, why am I waiting? While they were doing the digital transaction next to me, I told them, "Come on, teach me." Now, I send the saved digital transaction, and it's much easier. But if I need to send something new, I worry that I might type it incorrectly. So, I wait for my children and let them do it. (P35)

Both participants still experience digital dependency when they need to perform tasks they are unfamiliar with, relying on their relatives for assistance. While these helpers are usually close family members, P5 refers to these individuals as "my assistants" emphasizing their helping role.

In some cases, however, self-learning can emerge alongside digital dependency. P31, for example, states that although he seeks help from his son or grandchild, he also has a tendency to learn independently, exploring applications and enhancing his digital capital.

My children show me. My son, daughter-in-law, or grandchild teaches me. But sometimes, I figure things out on my own by trying. I learn by exploring the application. (P31)

Similarly, P42 stated that after learning from his children, he continued to explore and learn the application through personal experience.

I learned from my children; they download the apps. I cannot download apps myself—well, I could if I tried, but I just ask my grandchildren. They understand it better. Then I explore and learn by clicking around; things just pop up as I press. (P42)

Although P42 experiences a sense of dependency when it comes to downloading applications, he acknowledges that he could learn it if he wanted to, but he is simply not willing to, indicating a form of digital reluctance.

The data collected during the research reveal that participants have concerns about cybersecurity, fraud, and the protection of personal and digital data. Those who have such concerns do not feel secure when conducting digital transactions. In this context, participants perceive their lack of security as a disadvantage, which in turn leads to hesitation in using or learning digital technologies.

It's safer to handle these things in person. My spouse and children take care of these matters, but I don't understand them. I tell them, 'Look, you're dealing with these things, if you sign something by mistake, something happens, I swear I'll cut you off,' so they better be careful. (P1)

Furthermore, I'm also afraid. It is not that I am not scared of being scammed, especially when money is involved. I cannot use it properly anyway, so how am I supposed to control my money there? (P19)

When looking at the statements of the participants above, they have significant hesitation regarding digital transactions and experience a certain level of fear. Due to their low level of digital capital, they believe they cannot ensure their own security and therefore avoid using digital services such as digital banking.

I do feel a sense of fear, yes. Just an hour ago, something happened to me. I received a link, and I sent it to my daughter asking if it was safe. She clicked on it right away, and then her screen went black, which made her panic. She ended up canceling two of her cards—after all, she is a business owner (P26).

I think I will be scammed. My younger daughter's husband, my son-in-law, is a financial officer. He is an expert. Someone withdrew 6-7 thousand lira from his account. He struggled with it, but the bank did not accept any responsibility. They blamed him, saying he must have given his password to someone. That's why I fear such things. I told my children, 'I won't do it, you do it instead.' They are all university graduates; they know these things well. Whatever I ask them to do, they can handle it (P29).

Some participants have either experienced fraud on digital platforms or know someone in their close circle who has faced such a problem. In this context, P26 encountered a cyber attack shortly before the interview, turned to his daughter for help, and the daughter took action to secure financial transactions. P26, believing that his digital capital is insufficient, felt the need to seek confirmation from his daughter to verify the authenticity of a received message. Participants who lack sufficient knowledge about cyber threats tend to seek assistance from digital caregivers when they receive messages from unknown sources. P29, on the other hand, associates his son-in-law's experience of being defrauded despite being a financial expert with the perception that if someone with high financial knowledge can be deceived, he as an old person is in even greater danger. His strategy to ensure security is to delegate financial transactions to his children and rely on the children's digital capital.

Participants stated that due to their age, they face certain disadvantages when using digital technologies. Similar findings have been stated in several studies (Huxhold, Hees & Webster, 2020, p. 277; Lagace et al., 2016, p. 73; Morris, 2007, pp. 10-11). Some participants indicated that worsening eyesight at an advanced age significantly influences the choice of devices they use. P11 expressed difficulty in using smartphones due to vision problems and stated that he feels more comfortable using devices with larger screens, such as tablets and computers. P11 also mentioned that his spouse faced similar issues during the pandemic while conducting online education and had to switch to a device with a larger screen. Similarly, P14 highlighted the challenges posed by small smartphone screens.

Another disadvantage related to age is the unfamiliarity with the dynamics and norms of the digital world. Participants who are not acquainted with digital norms are more hesitant and cautious in performing online transactions compared to digital natives. Here, the second level of the digital divide becomes evident, namely the lack of digital literacy required to use digital technologies (Dimaggio, Hargittai, Celeste & Shafer, 2004; Selwyn, 2006; Zillien & Hargittai, 2009).

Among the themes that emerged from the study regarding perceived disadvantages are the transformation of social norms due to digitalization, the loss of norms, and the emergence of digital gossip culture, particularly through social media, which has altered the concept of private space. According to some participants, rapid digitalization has accelerated societal changes, making existing norms questionable, particularly for younger generations, and has even led to the disappearance of some norms. P41 expressed concerns that the overuse of digital platforms by younger generations negatively affects their socialization process. Using gender-based expressions, P41 voiced concerns that digitalization prevents women from learning the roles assigned to them by society. The idea that the social norms surrounding the image of women are at risk due to non-compliance with these roles is present in P41's statement. P43, on the other hand, nostalgically compares the pre-digitalization era with the present, emphasizing the negative aspects of changes in socialization norms. According to P43, family conversations have diminished, and digital devices now prevent people from engaging in face-to-face communication.

Another theme that emerged from the research is the time loss caused by the entertainment aspect of digital technologies and the spread of disinformation on digital platforms. The research findings highlight disinformation as an issue, referring to misleading information spread through digital media platforms. In this regard, P24 pointed out the difficulty of verifying the accuracy of information disseminated through some digital media platforms and expressed concerns about how such misleading information could lead to mass movements. Another issue, time loss related to spending too much time on digital entertainment platforms, is exemplified in P37's statements. She stated that she experiences time loss because she engages in digital entertainment instead of attending to her daily tasks.

Challenges Encountered in the Use of Digital Technology

The study identified various difficulties that participants face when using digital technologies and the reasons for experiencing these difficulties. A significant difficulty that emerged from the study is the lack of digital capital, which is a common issue among digital immigrants. In addition to digital capital deficiency, participants reported difficulties related to software updates, non-user-friendly interfaces, and challenges in using applications. The hierarchical code-subcode model of these difficulties, based on the frequency distribution, is presented in Graph 3, generated using the MAXQDA24 program.

Graph 3
Frequency distribution of code-subcodes related to the difficulties encountered in using digital technologies.

Difficulties Encountered in Using Digital Technologies

Lack of Digital Capital	42
Inability to Adapt to New Updates	4
Non-User-Friendly Interfaces	3
Infrastructure Deficiencies	1
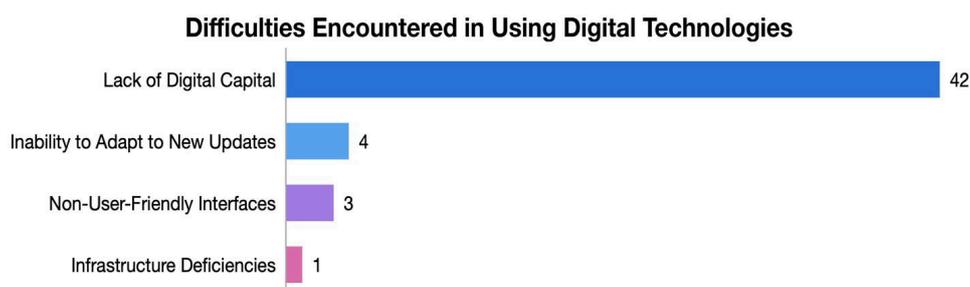
Graph 3 presents the hierarchical code-subcode model regarding the difficulties encountered in the use of digital technologies. Four subcodes were identified under the theme of difficulties in using digital technologies: lack of digital capital, inability to adapt to new updates, non-user-friendly interfaces, and infrastructure deficiencies.

Examining the frequency distribution of subcodes related to difficulties in using digital technologies, the most frequently mentioned issue was the lack of digital capital, with 42 mentions. The lack of digital capital refers to a low level of digital literacy or digital skills among elderly individuals.

Although the other subcodes were mentioned less frequently, they still represent significant challenges. The second most frequently mentioned subcode, following the lack of digital capital, was the inability to adapt to new updates, with 4 mentions. This was followed by non-user-friendly interfaces, with 3 mentions, and infrastructure deficiencies, with 1 mention.

The study found that the lack of digital capital is closely related to some subcodes under the disadvantages theme. Accordingly, a proximity analysis was conducted between the lack of digital capital and certain subcodes from the disadvantages theme. Figure 2 presents the proximity analysis of some subcodes under the disadvantages theme with the lack of digital capital.

Figure 2

Proximity analysis of subcodes related to the challenges encountered in the use of digital technologies and the disadvantages of digital technologies.
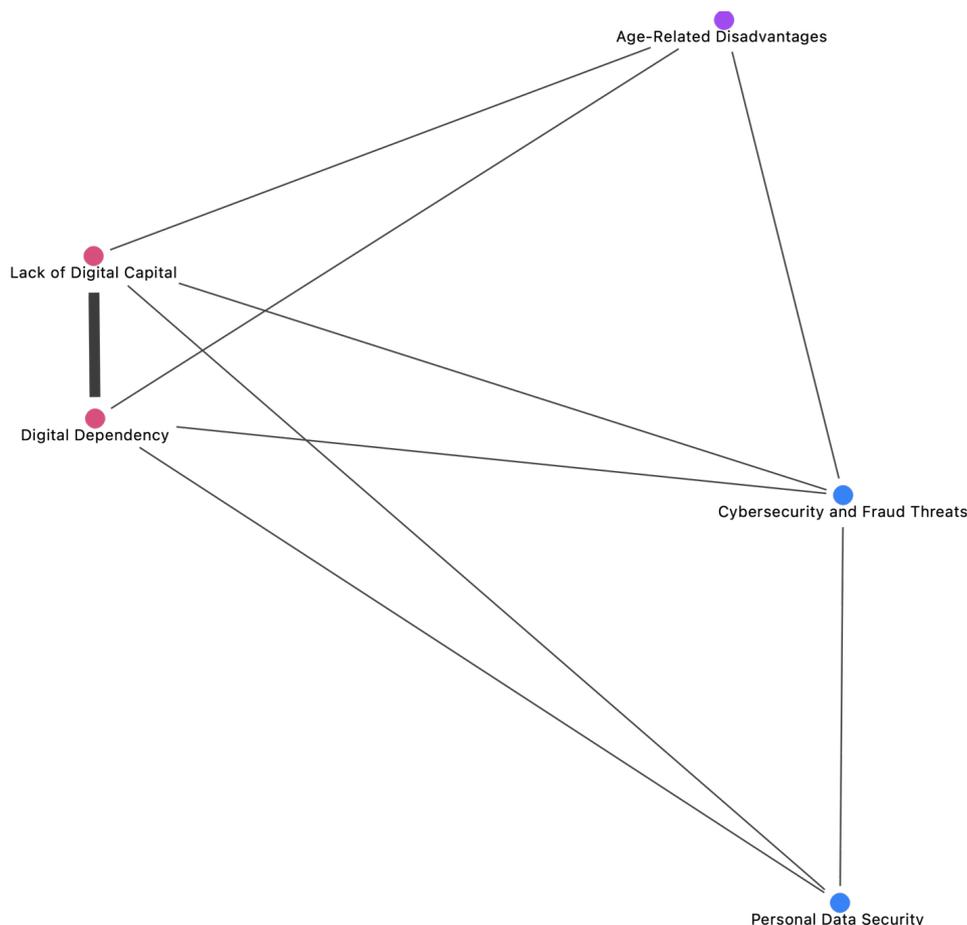
When examining Figure 2, it is observed that the subcode of digital capital deficiency is closely related to digital dependency, cybersecurity and fraud threats, the reliability of digital transactions, age-related disadvantages, and personal data security. The subcode most closely associated with digital capital deficiency is digital dependency. Participants have developed a strategy to overcome digital capital deficiency by seeking assistance from their close contacts, which falls under the subcode of digital dependency. The proximity analysis confirms the existence of this strategy. Similarly, another subcode closely associated with digital capital deficiency is cybersecurity and fraud threats. This supports the finding that digital capital deficiency leads to digital fear, primarily driven by concerns about being a victim to fraud.

The most significant challenge participants face in using digital technologies is digital capital deficiency (Ragnedda, 2018; Park, 2017). Due to their lack of digital experience, participants find themselves at a disadvantage in digital platforms, struggling to use these technologies effectively. When analyzing their online activities and time spent in digital environments, it becomes evident that they mostly engage with social media platforms. This supports Park's (2017) view that digital capital shapes how individuals interact with technologies, where its absence creates barriers to gaining digital literacy and effective use. Similarly, Yates and Lockley (2020) emphasize that inequalities in digital capital arise not only from access but also from differences in digital skills, usage levels, and the benefits derived from them. In line with these previous studies, some participants in this study also exhibit significantly low levels of digital capital in areas such as e-government, e-health, and digital banking services, as illustrated in the following statements:

> There are things I cannot do. Sometimes they seem simple. For example, I send a task to my assistant, and within 15 minutes, they complete something I have been struggling with for two hours. So, there are many things I cannot do, but I use digital tools at a basic level to manage my tasks (P14).

> I cannot manage E-Nabız. My grandchildren downloaded it at some point, so it's just there. I never touch it. I don't even know my password. My grandchildren do something with it, but I don't interfere in case something goes wrong (P22).

> A friend once told me to download it, and they helped me back then. But I don't use it. During the Covid period, I thought it might be necessary, but it wasn't really necessary. Besides, it's a bit complicated. Using it is difficult. I just cannot manage it (P24).

One of the advantages offered by digital technologies, preventing time loss, can be seen as a variable dependent on skill level. If an individual's digital capital is low, they may spend excessive amounts of time on tasks. In this sense, the level of digital capital determines the scope of the time constraints.

Participants who expressed that their digital capital was low in certain areas were generally observed to resort to two solutions. These solutions were either withdrawing from the digital space or receiving digital assistance from their relatives or friends. In other words, their low digital capital results in a state of digital dependency. However, while some participants feel a strong need for assistance, others can reach a level where they can handle their tasks independently over time. For example, P42's statement, "*I saw it from the kids, they download it… Then I explore and learn by clicking around, and eventually, I figure it out*" supports this analysis. Similarly, P46 sometimes needs assistance but follows a different approach from other participants whose digital capital is insufficient. P46's statement, "*First, I check on YouTube to see how it's done. Then, I look it up on Google as a second step. If I still don't fully understand, I call my daughters or son-in-law and ask them to help me. But if it's something I can manage, I try to do it myself.*" demonstrates

that when faced with a problem, she first turns to digital platforms and seeks help from relatives only as a last resort.

Conclusion

With the increase in the elderly population, discussions on digital inequalities have begun to consider age-related disparities and disadvantages. The elderly, who are forced to live in a world technologically very different from the one into which they were born, may struggle to adapt to new dynamics. Fundamentally, the elderly population is categorized as digital immigrants in the digitalization process and, as a result, faces difficulties in developing the capacity to integrate into these changes. At the core of this struggle lies a lack of digital capital. This deficiency, or in other words, low digital literacy levels, forces elderly individuals to develop new strategies to remain in the digital space or to withdraw from it altogether. One dimension of this research focuses on understanding the level at which the elderly experience the digital world, which depends on assessing their digital capacities. It is found that the digital capacities of participants aged 65 and over vary according to certain factors.

The study also revealed that one of the key triggers for entering the digital sphere was the COVID-19 pandemic. The elderly population, which was among the most affected groups during the lockdowns, had to use digital technologies and services. Some participants reported that they downloaded new applications or started using services they had never used before during this period. The findings demonstrate that while the COVID-19 pandemic accelerated the digital adoption of older adults, this process was often sustained through the support of close social networks, highlighting both the potential for increased digital literacy and the persistence of inequalities rooted in insufficient digital capital. Another factor that encourages elderly individuals to use digital technologies is whether they had prior work experience related to computers before retirement. Elderly people in this group experienced fewer difficulties in adapting to digital technologies and made faster progress in developing their digital capacities. However, data reveals that in some cases, the mandatory use of computers in the workplace has also led to early retirement decisions. In this context, concerns about integrating into digital technologies have been observed to prompt some elderly individuals to change their career paths.

Participants primarily developed their digital capital in areas such as social media, leisure-related digital activities, and communication. While they enhanced their capacities in social media and messaging, they lagged behind in domains such as e-health, e-government, and digital banking, often relying on others to access these services. Although smartphone users had no difficulty using digital technologies for social media and daily tasks, they expressed concerns when it came to public administration and banking services, largely due to the significant digital fear. In such cases, they preferred to seek assistance from digitally proficient acquaintances, often considered digital natives.

The study revealed that the advantages of using digital technologies include detachment from physical space, ease of acquiring information, elimination of time constraints and loss, instant communication, leisure activities, ability to perform transactions quickly, facilitation of work life, reduction of age-related disadvantages, opportunities for socialization, and elimination of class differences. On the other hand, the disadvantages experienced in the use of digital technologies were identified as digital dependency, cybersecurity and fraud threats, age-related disadvantages, personal data security concerns, unreliability of digital transactions, the concern of transformation of societal norms and norm loss, digital gossip culture, time loss, and disinformation.

The research found that elderly individuals often experience a state of digital dependency when accessing digital services. Digital dependency is a condition that arises due to difficulties in integrating into digital technologies due to age. In general terms, it refers to a situation where individuals over the age of 65 rely heavily on close acquaintances to access digital services. Elderly individuals experiencing digital dependency often appoint a close relative as a proxy to perform digital transactions on their behalf. One of the key reasons behind this dependency is insufficient digital capital. Individuals with low digital capital activate their social relationships and seek assistance from their close circles. This is largely driven by concerns about cybersecurity threats and fraud.

Stories of fraud, either personally experienced or heard from their close circle, act as a barrier, instilling fear of digital tools and services. This situation creates a vicious cycle: individuals, fearing digital transactions due to their low digital capital, avoid using digital technologies, which in turn prevents them from developing their digital capital. Thus, low digital capital fosters digital fear, and digital fear perpetuates low digital capital, ultimately leading to dependency on others for digital transactions. A similar pattern is observed in individuals' reluctance to trust digital transactions, which also stems from insufficient digital capital.

Older individuals who are uncertain whether digital transactions have a tangible equivalent like physical transactions may completely reject digital services. Another disadvantage associated with cybersecurity threats is concerns over personal data security. Elderly individuals who perceive themselves as vulnerable to cybersecurity risks develop a digital fear of having their personal data stolen, which often results in either completely abandoning digital services or allowing their close circle to use digital platforms on their behalf.

In line with these findings, some recommendations can be developed for policymaking and service provision processes targeting older adults. In particular, designing "digital literacy" courses or services for older individuals with high digital care needs due to insufficient digital capital would be an important step in ensuring their self-sufficiency. Moreover, even for those who are currently self-sufficient, it is crucial to anticipate their increasing digital care needs as they age, as well as to enhance their capacity for protection against digital risks. The growing likelihood of becoming victims of digital fraud is also an important issue for policymakers. One of the barriers preventing older adults from benefiting equally from digital services as citizens is their fear of becoming victims of digital fraud. This study has identified that older individuals increasingly need support regarding digital fraud. Therefore, providing information and support on digital fraud is of key importance for policymakers to ensure that older adults do not avoid using digital tools in their daily lives.

In addition, special attention should be paid to ensuring that digital applications developed by either the public or private sector are age-friendly. User-centered problems such as older adults being unable to use interfaces after updates, experiencing visual difficulties due to small font sizes, and the overall lack of consideration of older adults' needs in interface design have been identified in this study as significant barriers to the use of digital technologies. For this reason, application developers should consider the diverse needs of older users when designing applications. If these applications are provided within the context of public services, age-based application development alternatives should also be considered.

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