UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

OBSTACLES AND OPPORTUNITIES FOR BRIDGING THE DIGITAL DIVIDE AMONG THE ELDERLY IN SLOVENIA

Ljubljana, May 2025 ANJA HORVAT

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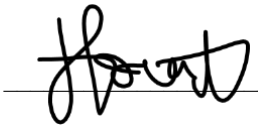
Ljubljana, May 12th, 2025 Author's signature: 

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sl. – Slovene

AI – (sl. Umetna inteligenca); Artificial Intelligence

COVID-19 – (sl. Koronavirusna bolezen 2019); Coronavirus Disease 2019

DESI – (sl. Indeks digitalnega gospodarstva in družbe); Digital Economy and Society Index

EU – (sl. Evropska unija); European Union

ICTs – (sl. Informacijsko in komunikacijske tehnologije); Information and communication technologies

NGO – (sl. Nevladna organizacija); Non-Governmental Organization

SURS – (sl. Statistični urad Republike Slovenije); Statistical Office of the Republic of Slovenia

UI – (sl. Uporabniški vmesnik); User Interface

UX – (sl. Uporabniška izkušnja); User Experience

1 INTRODUCTION

In today's world, the digital landscape is not just a parallel universe running alongside our everyday lives; it is deeply intertwined with almost everything we do. The Internet, for instance, has become an indispensable tool. In 2000, only about 52% of adults in the United States were online. Fast forward to today, and that number has exceeded 93% (Doong & Ho, 2012). This remarkable growth is largely due to the continuous advancement of information and communication technologies (ICTs), which have defined the last two decades (Pratt, 2021). The rapid pace of technological innovation and the digitalisation of essential services and businesses offer us greater efficiency, faster access, and a host of other benefits. It has transformed the way we communicate, work, and engage with the world around us - opening new opportunities that were previously unimaginable.

However, this rapid digital shift has not come without challenges. One of the biggest hurdles has been faced by those who lived most of their lives before the digital revolution, particularly seniors. Many older individuals find themselves struggling to adapt to new technologies due to a lack of digital skills and limited access to digital tools (McDonough, 2016). Unlike younger generations, who have grown up surrounded by digital devices, older adults often find modern technology anything but intuitive (Vaportzis et al., 2017). For many seniors, navigating a smartphone or using the Internet - tasks that seem second nature to younger people – can be daunting. As a result, large segments of the elderly population remain excluded from fully participating in the digital world. Yet, the use of ICTs can grant them access to essential public services and significantly improve their quality of life, increasing feelings of independence, personal growth, and belonging. The age-associated digital divide, however, prevents many from utilising this (Niehaves & Plattfaut, 2014).

The concept of the digital divide describes the separation between those who have access to global digital networks and those who do not. There are three recognised stages of this divide. The first is an economic divide, referring to inequalities between individuals who can afford digital devices and Internet access and those who cannot. The second is a usability divide, separating those who possess the skills and competencies to benefit from technology from those who do not. Even with access to hardware and software, many people, especially those with low digital literacy, are unable to fully utilise digital tools – a challenge particularly acute among seniors. Finally, the third stage is the empowerment divide, which is the most difficult to bridge. It concerns the ability to use technology not merely for consumption but for empowerment: creating content, understanding the power of digital tools and critically navigating digital information. (Bourgeois et al., 2019).

One way of measuring the digital divide is by assessing an individual's digital literacy – their ability to find, evaluate, and communicate information effectively across digital platforms (TeachThought, 2022).

Despite recent advancements, particularly in expanding broadband access across the European Union, digital exclusion among seniors remains a pressing issue in many countries, including Slovenia. Until 2022, the European Commission measured Europe's digital performance using the Digital Economy and Society Index (DESI), which has since been integrated into the State of the Digital Decade report (European Commission, 2024). Indicators such as human capital (digital skills), connectivity, business digitalisation, and digital public services remain key measures. According to the latest available data, only 54% of adults in Europe possess at least basic digital skills, meaning that 46% still lack sufficient digital competencies (European Commission, 2024).

In the 2022 DESI rankings, Finland, Denmark, and the Netherlands led the EU, while Greece, Bulgaria, and Romania ranked lowest (European Commission, 2022). Slovenia was ranked 11th, with a score of 53.4, slightly above the EU average of 52.3 (European Commission, 2022). These statistics underline the urgent need to address digital skills gaps, particularly among seniors, to ensure inclusive participation in digital society.

Significant investments have been made to develop the ICT sector within the EU. Nearly 130 billion euros has been allocated to digital transformation initiatives aimed at creating more supportive living environments for seniors (European Commission, 2022). Yet, despite technological advancements, there remains a significant education gap that must be addressed to bridge the digital divide. This thesis aims to assess these challenges and explore potential solutions, focusing specifically on the situation in Slovenia, where there has been limited research on this topic.

The purpose of my research is to help understand the challenges faced by the elderly population in today's world. In the last couple of years many things have digitized and as I am living above my grandparents, I was able to see first-hand the struggles they are facing because of the lack of knowledge and practice regarding technology. They are excluded from many areas of knowledge, services, products, and content. With this thesis I want to help recognize the challenges and concerns, as well as provide possible solutions that will help elders overcome struggles they face. This will enable all generations better access and higher contribution, as well as better generational knowledge share and exchange of best practices. In addition, it will contribute to our understanding of the digital divide in Slovenia specifically.

The goals of my master thesis are:

- To review the main challenges faced by elders regarding digital skills and knowledge (based on a literature review).
- To examine current best practices across the EU (based on secondary data).
- To evaluate the effectiveness of currently implemented programmes in Slovenia.
- To assess the impact of COVID-19 on the elderly's access to digital infrastructure in Slovenia.

- To propose solutions for reducing the age-related digital divide in Slovenia (and elsewhere).

The methodology of this thesis combines both a theoretical and an empirical part. The theoretical part includes a comprehensive literature review and research on the digital literacy of the elderly. The empirical part relies on both secondary and primary data sources. Secondary data from reliable statistical databases such as SURS and Eurostat are used to assess the current level of digital usage among older adults. In addition, mini case studies of European initiatives aimed at enhancing digital literacy in senior populations are critically evaluated to identify best practices and to inform potential improvements in Slovenia. For the primary data collection, an in-depth expert interview is conducted with Ana Petrič, Director of the Senior Centre in Slovenia, to gain first-hand insights into the challenges faced by the elderly in the digital sphere. This interview complements the theoretical findings with real-life perspectives, offering a deeper and more practical understanding of the issues at hand.

The thesis is divided into seven chapters, each addressing a key component of the research. The Introduction outlines the background, motivation, and main research questions, with a focus on the digital divide among the elderly in Slovenia. Chapter 2 provides a broader context by examining the digital gap, including the role of innovation, demographic changes, and the consequences of digital exclusion. Chapter 3 narrows the focus to Slovenia, presenting statistical data, key factors influencing digital inclusion or exclusion among seniors, and a comparative analysis of solutions implemented in other countries. Chapter 4 describes the methodology, combining a theoretical review with empirical research, including secondary data analysis and the expert interview. Chapter 5 presents the findings, highlighting key results from case studies, identifying best practices across Europe, and proposing potential solutions for Slovenia. Chapter 6 offers a critical discussion of the results, addressing research limitations, presenting policy recommendations, and suggesting directions for future research. Finally, Chapter 7 concludes the thesis by summarising the main findings and emphasising the importance of addressing digital exclusion among the elderly.

By investigating the digital divide among the elderly in Slovenia, this thesis will contribute to a better understanding of the barriers and opportunities for digital inclusion. It will evaluate the effectiveness of current initiatives and propose strategies to enhance digital literacy and access for older adults, ensuring that no one is left behind in the digital age.

2 DIGITAL GAP, CHALLENGES, CONSEQUENCES

The rapid advancement of digital technologies has transformed many aspects of daily life, from the way we communicate to how we access services and engage in civic activities. However, these advancements have not been universally accessible, creating what is often

referred to as the digital divide. This divide is particularly pronounced among older adults, who face unique challenges in accessing and using digital technologies. This chapter explores the existing literature on the digital divide, examining the various challenges faced by elderly populations and the consequences of digital exclusion.

2.1 Innovation, digitalisation, and ICTs

Innovation, digitalisation, and information communication technologies (ICTs) have dramatically transformed modern world, ushering in an era of connectivity, efficiency, and convenience (Gradillas & Thomas, 2023). Rapid advances in computing, telecommunications, and data analytics have not only streamlined operations but have also fundamentally changed how we live, work, and interact (Đorić, 2022). For example, the ways we communicate, access healthcare, and learn today would have been unimaginable just a few decades ago (Betts et al., 2017).

At the heart of this transformation lies digitisation—the process of converting information into digital formats. This shift enables faster, more efficient communication and helps to break down geographical and temporal barriers (Esteban-Navarro et al., 2020). ICTs, including computers, smartphones, high-speed internet, and cloud technologies, have become the backbone of modern life (Bourgeois et al., 2019), powering everything from public administration services to social media and online banking. Digital transformation begins with the fundamental change in how information is stored, processed, and communicated—moving from analogue systems towards digital systems (Gradillas & Thomas, 2023).

This transformation has not occurred gradually, but at an astonishing pace. Merely thirty years ago, most people depended on analogue tools and face-to-face communication. Today, a stable internet connection and access to digital devices are often prerequisites for even basic services. Booking a doctor's appointment, managing prescriptions, or using public services increasingly requires digital skills (Garcia et al., 2021).

Thanks to the digitisation of information, people from diverse geographical areas can now easily exchange knowledge and collaborate. This facilitates richer perspectives and enables individuals with shared interests to connect across borders (Gradillas & Thomas, 2023). ICTs encompass hardware and software technologies that enable the creation and communication of images, audio, and video electronically (Doong & Ho, 2012).

Yet, while these technologies offer remarkable opportunities, they also introduce new forms of dependency. Many services that previously required no technical skills are now available exclusively online. For the digitally literate, this brings immense convenience—but for others, especially the elderly, it can result in a new kind of exclusion (Vaportzis et al., 2017).

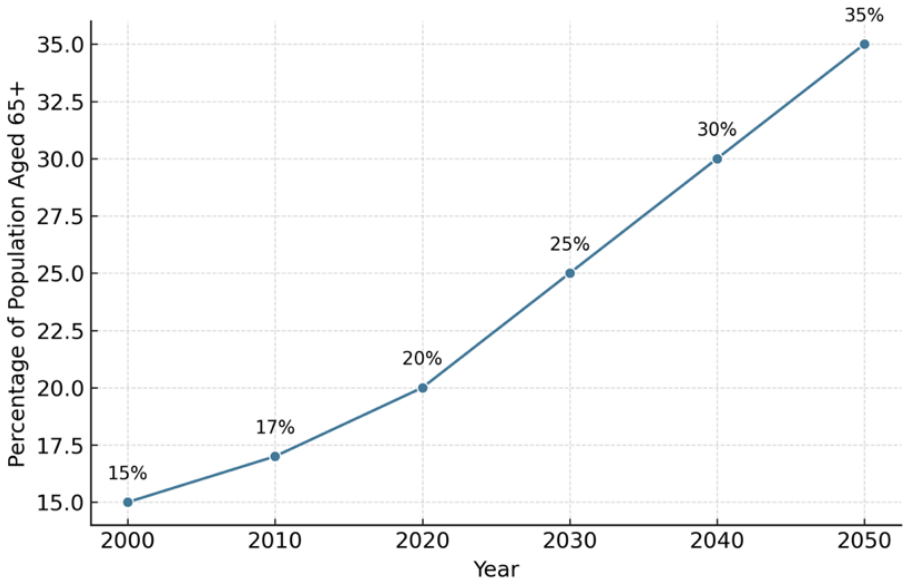
ICTs—comprising personal computers, smartphones, broadband internet, and cloud computing—now form the foundation of the digital economy (Bourgeois et al., 2019). They not only drive economic and social development but also enable continued technological innovation (Abraham et al., 2011). Furthermore, ICTs blur the boundaries between the physical and digital worlds, creating new forms of social interaction and engagement (Ferreira et al., 2016). Platforms such as social media, e-commerce, and digital communication tools have revolutionised how people interact (Ragnedda et al., 2022). Today's digital economy is defined by innovation, adaptability, and scalability (Afzal et al., 2023).

In short, while digitalisation offers significant benefits, it simultaneously raises important concerns about equity and access. Understanding the role of innovation and ICTs in shaping daily life is critical to addressing the digital divide. For Slovenia's ageing population, this underscores the need for targeted support, not merely to adopt digital technologies, but to truly benefit from them.

2.2 The ageing population of the developed world

Developed nations have undergone significant demographic shifts, accompanied by marked increases in life expectancy. According to Alvarez (2022), these trends stem from two interconnected factors: declining birth rates and rising life expectancy. Innovations in healthcare, healthier lifestyles, technological progress have made it possible to extend human life expectancy to unprecedented levels (Hirvonen et al., 2021). At the same time, developed countries have witnessed a sharp decline in birth rates (Alvarez, 2022).

Figure 1: Growth of the Ageing Population in Developed Countries (2000-2050)



Source: Adapted from SURS (2023).

The line chart above (Figure 1) illustrates the projected increase in the proportion of the population aged 65 and older in developed nations between 2020 to 2050. It reveals a steady upward trend, reflecting longer life expectancy and lower birth rates. By 2050, it is estimated that 35% of the population in developed countries will be aged 65 or over, compared to 20% in 2020 (Eurostat, 2024).

According to the Statistical Office of the Republic of Slovenia (SURS), Slovenia's population is expected to undergo considerable ageing in the coming decades. In 2022, individuals aged 65 and over accounted for just over 21% of the population. This proportion is projected to rise to more than 32% by 2100 (SURS, 2023). These demographic changes are closely connected to broader societal trends. Urbanisation, higher educational attainment among women, and changing family structures have all contributed to a drop in fertility rates (Alvarez, 2022). In 2023, Slovenia recorded fewer than 17,000 births for the first time since records began in 1922, with a total of 16,989 live births—a 3.6% decline compared to 2022 (SURS, 2024).

An ageing population brings a range of social and economic consequences. It places increasing pressure on healthcare systems, social welfare programmes, labour markets, and the adoption of new technologies (Hirvonen et al., 2021). In this respect, Slovenia reflects broader demographic trends seen across much of the developed world, where longer life expectancy and declining birth rates are leading to a progressively older population. Responding to these changes will require comprehensive policy planning and long-term adaptation at both national and community levels.

Given these trends, it is likely that the proportion of elderly individuals will continue to grow, creating greater demand for healthcare services, long-term care facilities, and pension systems. At the same time, a shrinking workforce will be expected to support a growing retired population, which will introduce new economic and social pressures (Valokivi et al., 2021).

The digital age presents both opportunities and challenges for an ageing society (Hirvonen et al., 2021). While older adults are increasingly investing in digital products and services, many still face obstacles such as limited digital literacy and access (Martínez-Alcalá et al., 2018). These barriers prevent full participation in the digital world and can lead to further social exclusion.

The generational digital divide continues to widen, as older individuals often struggle to keep pace with rapid technological change and evolving user interfaces (Vaportzis et al., 2017). In this context, adapting digital tools to better meet the needs of older adults will be key to ensuring that ageing populations remain included and supported in a society that is becoming more reliant on digital solutions.

2.3 Digital Divide

The digital divide refers to the disparity between those who have access to modern information and communication technologies (ICTs) and those who do not (Bourgeois et al. 2019). It describes the gap between individuals who have the means to access and use digital services and those who are excluded.

Central to understanding the digital divide is the concept of digital literacy. Digital literacy involves more than the ability to use a computer; it encompasses a broad range of skills, including the ability to locate, evaluate, and use information effectively (Bourgeois et al., 2019). For many seniors, developing these skills can be challenging, especially when they have had limited exposure to digital technologies throughout their lives (Betts et al., 2017).

As digital literacy becomes increasingly essential for everyday tasks, the lack of such skills impacts the quality of life among older adults. The digital divide is a multifaceted issue that includes economic, social, geographic disparities, resulting in unequal opportunities to access digital resources (Bourgeois et al. 2019).

The age-related digital divide specifically highlights the gap between generations in the adoption and use of digital technologies (Papí-Gálvez & Parra-Casado, 2023). Older adults, who did not grow up surrounded by digital devices, often find it difficult to navigate new technologies. Unlike younger generations, who have been immersed in digital environments from an early age, seniors face hurdles such as unfamiliarity, cognitive impairments associated with ageing, and fears about privacy and security.

Moreover, the psychological dimension plays a critical role. Many seniors have negative perception of technology, which further reduces their likelihood of adopting it (Pangrazio et al., 2020). These perceptions can stem from fear of failure, frustration with complicated interfaces, or concerns about their ability to keep pace with change.

Socioeconomic barriers further exacerbate age-related digital exclusion. Seniors from disadvantaged backgrounds – particularly those with lower incomes or limited education – are more likely to encounter obstacles in accessing digital infrastructure, thereby reinforcing social inequalities (Papí-Gálvez & Parra-Casado, 2023). In these cases, limited financial resources, lower educational attainment, and lack of infrastructure converge to widen the digital gap.

Digital inequalities can be explained through two key concepts: the first level and the second level divide. The first level divide concerns uneven access to digital resources, such as internet connections and devices. While global efforts have increased access to technology, significant disparities remain, particularly in rural and less-developed areas. In many cases, digital infrastructure is concentrated in urban centres, leaving rural communities underserved (Ferreira et al., 2021).

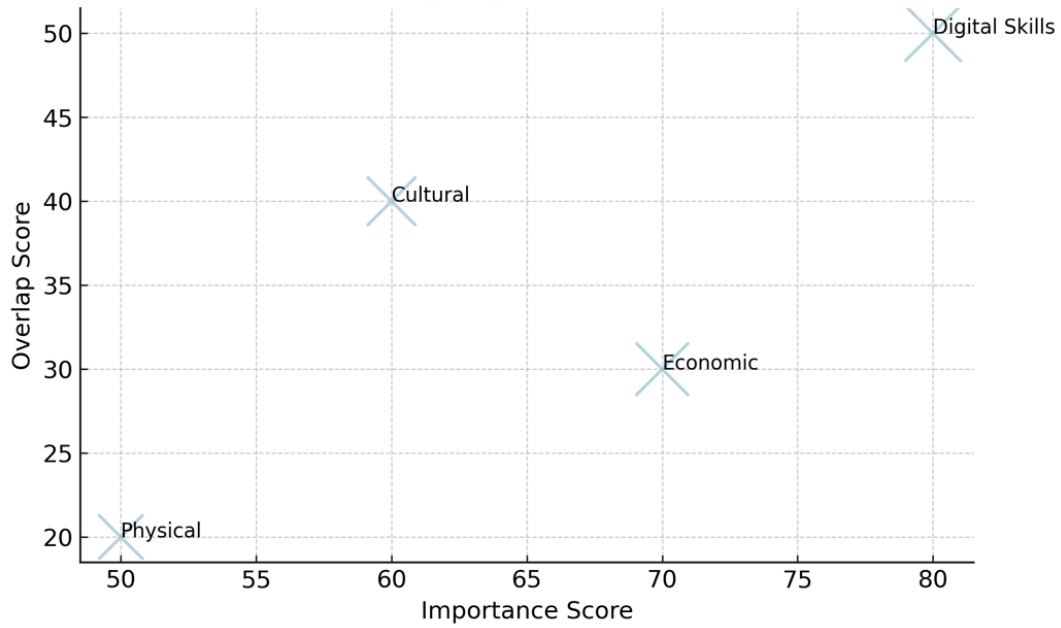
The second level divide relates to the competencies required to use digital resources effectively. Even when access is available, without the necessary skills, individuals cannot fully participate in the digital world (Bourgeois et al. 2019). Seniors, therefore, require not just access but also support in building confidence, learning how to navigate digital platforms, critically evaluating online content, and protecting themselves from digital threats (Ragnedda et al., 2022).

A significant issue facing many elderly individuals is the lack of necessary skill sets. Without these abilities, they are unable to exploit the full potential of digital technologies, thus excluding themselves from economic, social, and informational opportunities in the digital era (Betts et al., 2017).

2.4 Factors that affect the inclusion or exclusion of seniors

The inclusion or exclusion of elderly individuals in the digital world is influenced by a wide range of factors. These include socio-demographic characteristics, physical and cognitive abilities, motivation, psychological factors, and the design of digital technologies themselves (Betts et al., 2017). The factors that either enhance or limit the inclusion of older individuals differ and create a complex problem that requires a close examination of several interconnected challenges to effectively eliminate the barriers between the older population and digital technologies (Neves et al., 2019).

Figure 2: Factors Affecting Digital Inclusion of Seniors



Source: Adapted from Eurostat (2024).

Figure 2 helps us understand how different factors contribute to the digital inclusion or exclusion of seniors. The X-axis represents the perceived importance of each factor, while

the Y-axis indicates its degree of overlap with other digital barriers. Digital skills stand out as the most critical factor, exhibiting both high importance and a strong connection to other exclusion factors. Economic barriers follow closely, as financial constraints limit access to necessary digital tools. Cultural influences and physical limitations also play important roles, although they show different degrees of interconnection with other factors (Eurostat, 2024). By illustrating both the importance and overlap of these factors, the figure highlights the complexity of the digital divide and the need for multifaceted solutions.

Let us take a closer look at several interrelated factors that contribute to the digital inclusion or exclusion of seniors:

Socioeconomic factors significantly influence digital inclusion. Economic constraints represent a major barrier for many seniors, as limited financial resources can prevent the purchase of necessary digital devices or subscriptions to internet services. Seniors living on fixed incomes, such as pensions, often prioritise basic needs over digital access (European Union Agency for Fundamental Rights, 2023). In Slovenia, elderly individuals from lower-income backgrounds or rural areas are less likely to have access to the necessary digital infrastructure, such as reliable internet connections or up-to-date devices (Duh, 2024). This lack of access is often compounded by low levels of digital literacy, further preventing seniors from fully utilising digital resources. To address these disparities, targeted interventions that consider both geographic and socioeconomic barriers are essential (Correa & Pavez, 2016).

The educational background of seniors greatly influences their digital literacy. Those with lower levels of formal education are less likely to possess the skills needed to navigate digital environments confidently. This gap underscores the need for targeted educational programmes designed specifically to improve digital literacy among older adults (Pangrazio et al., 2020).

Psychological and cultural barriers also play a significant role. Psychological barriers, including fear of technology and perceptions of its irrelevance, frequently contribute to digital exclusion among the elderly. Astell et al. (2019) explore how an older adult's identity and previous experiences with technology shape their willingness to adopt new digital tools. Many seniors perceive technology as something intended for "the young," creating psychological barrier to digital engagement. Addressing these perceptions through targeted, age-appropriate training and support initiatives can help mitigate these fears and foster a more positive attitude toward technology. Additionally, cultural attitudes towards technology influence the willingness of older adults to engage with digital tools. Many seniors view technology as irrelevant to their daily lives, further widening the digital divide (Pangrazio et al., 2020). Overcoming these cultural barriers requires consistent efforts to demystify technology and clearly demonstrate its practical benefits (Papí-Gálvez & Parra-Casado, 2023).

Physical and cognitive limitations are another critical factor. Age-related challenges, such as declining vision, hearing loss, and reduced fine motor skills, can make it difficult for seniors to use digital devices effectively (Gitlow, 2014). Cognitive impairments associated with ageing may also impact their ability to learn and retain new technological skills, reinforcing the need for user-friendly designs and supportive learning environments tailored to older users' needs.

Technological barriers remain a primary contributor to the digital divide among the elderly. Rapid technological advancements often outpace the ability of older adults to adapt, leading to a sense of alienation and frustration (Gitlow, 2014). Additionally, the complexity of new devices and applications can be overwhelming, particularly for those without prior exposure to digital technologies. Many elderly individuals also lack access to high-speed internet or the latest digital devices, exacerbating feelings of exclusion (Mlakar, 2023).

Finally, the presence or absence of social support networks significantly affects seniors' engagement with technology. Seniors with supportive families, friends, or access to community programmes are more likely to become digitally literate. Community-based initiatives play a crucial role in providing the encouragement and assistance for seniors to overcome initial barriers to technology use (Bourgeois et al., 2019).

2.5 Consequences of digital exclusion for seniors

Digital exclusion arises when individuals do not have easy access to the necessary equipment or knowledge to utilise available resources. This issue manifests at different levels – individual, societal and systemic – and this is most notable among the older age groups.

2.5.1 Individual digital exclusion

Digital exclusion can have profound impacts on individuals, particularly seniors, by limiting their access to essential services and information, thereby exacerbating existing social and economic inequalities (Ragnedda et al., 2022). For many older adults, a lack of digital skills means missing out on conveniences such as online banking, healthcare services, or access to government resources. This lack of access can lead to increased isolation, loneliness, and a reduced quality of life, as digital platforms are increasingly becoming vital avenues for social interaction and community engagement (European Union Agency for Fundamental Rights, 2023).

As the global sector becomes increasingly digitised, most services - ranging from banking and healthcare to government services - are now accessed primarily online (Abraham et al., 2011). Many older individuals lack digital literacy and skills needed to operate these platforms and are consequently excluded from essential services (Betts et al., 2017). Moreover, the mainstream adoption of the internet is significant not only because social

media platforms are major means of communication, but also because digital exclusion can lead to social isolation and loneliness. Both conditions are recognised contributors to mental health challenges, ultimately diminishing overall quality of life (Astell et al., 2019).

Digital technologies serve as tools through which people socially engage, interact, participate in community activities, and locate support systems (Ferreira et al., 2021). In contrast, seniors who are not knowledgeable about accessing and using digital technologies may experience digital shutout and loneliness, resulting in disengagement from their loved ones and communities (Betts et al., 2017). Often this exclusion is further aggravated by cognitive limitations associated with ageing, and the resulting isolation can lead to a decline in mental health and overall happiness (Gitlow, 2014).

2.5.2 Social digital exclusion

The impact of digital exclusion extends beyond individual experiences and penetrates social structures, reinforcing social inequalities and undermining social cohesion and inclusivity (Đorić, 2022). Digital separation contributes to inequality by limiting access to education, employment, and other economic opportunities. Underserved communities, including older adults, are often trapped in cycles of poverty, exacerbated by limited digital skills. Many seniors lack the computer and internet knowledge necessary to actively use online services, posing a significant barrier to employment and reducing their chances for economic advancement (Betts et al., 2017). This gap in digital literacy further widens socio-economic inequalities, perpetuating cycles of digital exclusion, poverty, and deprivation (Betts et al., 2017).

Additionally, a lack of digital skills among older adults hinders their ability to participate fully in civic and social activities, including voting, engaging in public discourse, and accessing information critical for civic engagement (Betts et al., 2017). The digital divide can thus undermine democratic values and principles of justice, as digitally excluded groups find it increasingly difficult to engage in discussions and decision-making processes that predominantly take place on digital platforms (Astell et al., 2019).

Furthermore, digital exclusion forces older adults to remain on the periphery of online networks and virtual communities, threatening social cohesion and contributing to social disintegration (Gitlow, 2014). The growing digital skills gap between tech-savvy individuals and those without digital literacy has led to increased social segregation, particularly among the elderly (Astell et al., 2019). This exclusion disrupts intergenerational ties within communities, often leaving older adults increasingly dependent on younger people even for minor digital tasks. As a result, digital isolation not only affects social harmony but and exacerbates divisions within society (Ferreira et al., 2021).

2.5.3 Systemic digital exclusion

At a systemic level, digital exclusion impacts national growth by reducing productivity, limiting innovation, and weakening economic competitiveness (Ragnedda et al., 2022). A significant portion of the population lacking digital literacy restricts overall economic prosperity and increases the burden on social welfare systems. The digital divide often prevents young adults from leveraging the full potential of digital technologies, while older adults, unable to utilise digital tools, continue to work manually, thereby reducing overall output and efficiency (Betts et al., 2017). This digital illiteracy undervalues the nation's wealth of experience, skills, and wisdom contributed by older generations, limiting broader economic advancement (Gitlow, 2014).

Exclusion from digital platforms results in wasted state resources and amplifies existing inequalities, as governments are often forced to reallocate funding towards supporting digitally excluded groups (Ferreira et al., 2021). Particularly in lower-income countries, the lack of adequate digital services presents significant challenges. Despite substantial initial investments into digital literacy programmes and internet infrastructure, the benefits often fail to produce sustainable long-term outcomes, diverting resources from other urgent social needs or programmes (Đorić, 2022).

Moreover, the disadvantages of the digital gap extend to political participation and governance. A significant segment of the population, unable to engage with digital platforms, is excluded from political decision-making processes and democratic functions, weakening democratic governance and social cohesion (Astell et al., 2019). The digital divide contributes to inequalities in political representation, deepening power imbalances and undermining fundamental democratic principles of equality, participation, and accountability (Betts et al., 2017). Consequently, the disconnect between citizens and their leaders diminishes public trust in governmental institutions and structures (Ferreira et al., 2016).

2.6 The impact of COVID-19 on digital inclusion and the elderly

The COVID-19 pandemic has further widened the digital divide, particularly among the elderly. As governments around the world implemented strict lockdowns and social distancing measures to curb the spread of the virus, reliance on digital platforms for communication, healthcare, and daily activities increased dramatically (Garcia et al., 2021). Many older adults struggled to keep pace due to a lack of digital skills and limited access to necessary devices, leaving them feeling more isolated and disconnected from essential services and social support networks. This situation highlighted the urgent need for improved digital literacy and access among the elderly to ensure their inclusion in an increasingly digital society (Garcia et al., 2021).

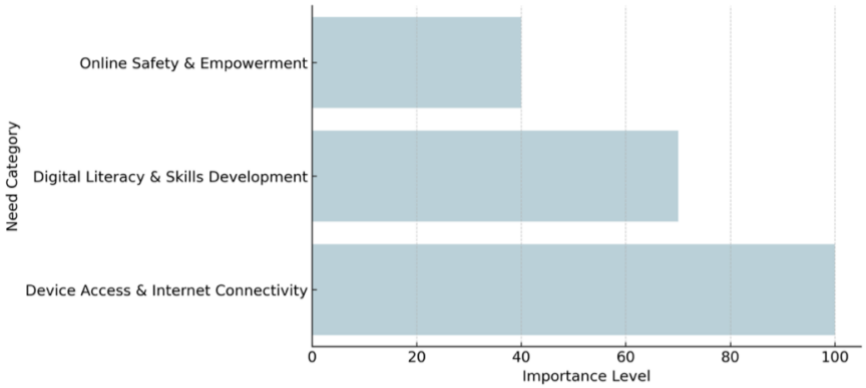
With physical interactions constrained, digital platforms became vital substitutes for maintaining personal relationships, accessing healthcare, continuing professional employment, and participating in education (Betts et al., 2017). Digital technologies played a key role in delivering health services during the pandemic, becoming one of the main solutions for maintaining healthcare access amidst severe restrictions (Battelino & Turk, 2022). Government-imposed limitations disrupted traditional in-person interactions, forcing many elderly individuals to remain at home without regular contact with the outside world or even their families. Consequently, they not only missed out on direct human interaction but also faced challenges in accessing doctors and managing essential governmental services, many of which shifted entirely to digital platforms (Garcia et al., 2021).

The lack of digital literacy, the inability to obtain necessary devices, and limited internet access were significant barriers for many older adults (Betts et al., 2017). The shift from in-person work environments to remote work and telehealth services underscored the urgent need for digital skills and resources that would enable older individuals to participate more fully in both the workforce and healthcare systems (Garcia et al., 2021). Although digital platforms provided critical opportunities during the pandemic, older adults continued to face substantial challenges in accessing telehealth services, highlighting the persistent need for targeted initiatives aimed at bridging the digital divide (Garcia et al., 2021).

2.7 Challenges to digital inclusion

Despite ongoing efforts to close the digital divide, many challenges remain. Rapid technological advancements often outpace the ability of older adults to learn and adapt, creating significant obstacles (Gitlow, 2014). Beyond the speed of these changes, issues such as limited digital literacy, inadequate infrastructure in some areas, and socio-cultural factors strongly influence how older people perceive and interact with technology. Addressing these barriers requires a comprehensive approach that extends beyond technology itself, incorporating education, support systems, and community engagement (Afzal et al., 2023).

Figure 3: Hierarchy of Digital Needs for Seniors



Source: Adapted from European Commission (2022).

Figure 3 illustrates the hierarchy of digital needs for seniors. The horizontal bar chart displays the progression from basic needs, such as device access and internet connectivity, at the foundational level, to higher-level needs like digital literacy, skills development, and online safety and empowerment at the top. Visual highlights the fundamental requirements for digital inclusion and the successive steps necessary for achieving full digital participation among seniors.

Overcoming these challenges and meeting the needs requires a multi-faceted strategy that addresses technological, educational, and cultural barriers simultaneously. Technological barriers present significant hurdles for older adults seeking to engage with digital platforms. The rapid pace of technological innovation demands an adaptable skill set that can accommodate continuous change. However, older adults often face cognitive and physical limitations that impede their ability to acquire and retain new skills necessary for effective use of digital technology (Gitlow, 2014). The complexity of emerging technologies can overwhelm older users, resulting in disengagement and reluctance to use digital devices altogether.

In addition to technological barriers, limited digital literacy and skills among the older population continue to contribute to the widening digital divide (Betts et al., 2017). Many seniors, having been born before the digital revolution, lack the foundational knowledge required to navigate online platforms, evaluate credible information, and protect themselves from online threats such as scams and identity theft. As a digital interactions become increasingly integrated into everyday life, these knowledge gaps further isolate seniors from important services and opportunities.

Moreover, digital infrastructure and socio-cultural factors present additional challenges in efforts to bridge the digital divide (Afzal et al., 2023). Poor digital infrastructure, particularly in rural and marginalised communities, severely hampers progress. Inadequate internet coverage and limited availability of electronic devices disproportionately affect older population in these areas. Even where infrastructure is available, older adults' social and cultural beliefs significantly shape their willingness to adopt digital technologies. Factors such as fear of technology, concerns about privacy, and distrust of online platforms discourage many seniors from engaging with digital tools, further widening the digital divide (Astell et al., 2019).

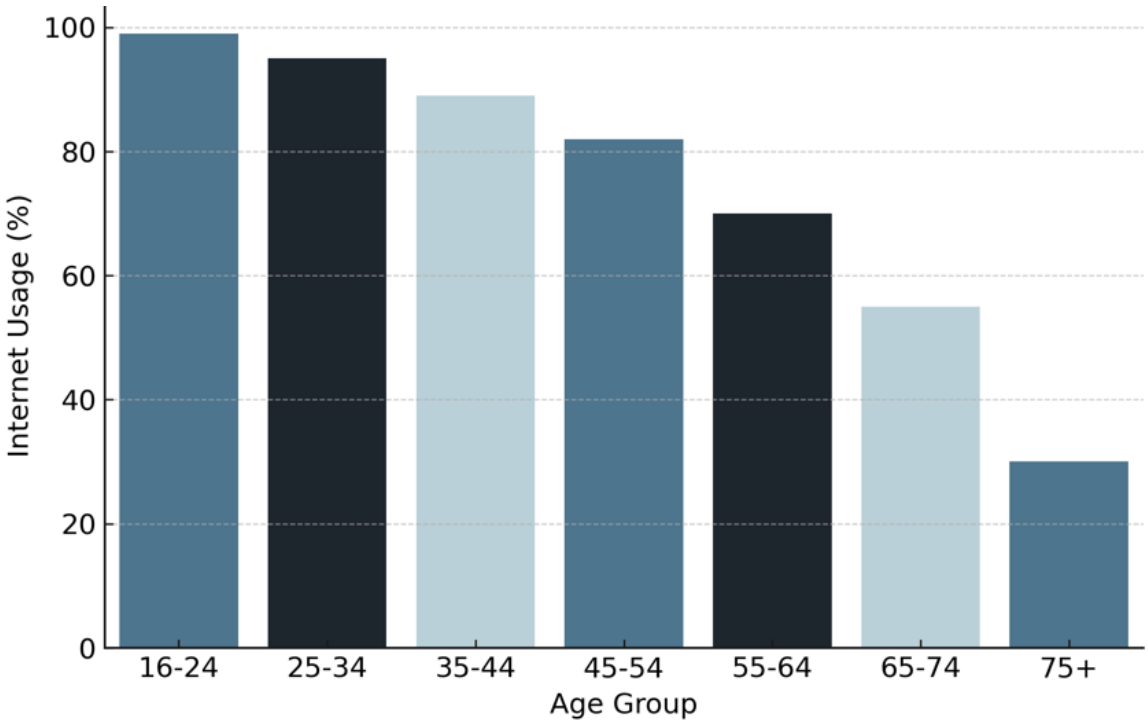
3 DIGITAL DIVIDE IN SLOVENIA

Slovenia, like many other nations, experiences a significant digital divide, particularly affecting its elderly population (European Commission, 2022). This divide reflects a broader global issue of unequal access to technology and digital literacy, which is critical in a world increasingly dependent on digital services and communication (Duh, 2024).

In Slovenia, the digital divide is especially pronounced among older adults, who often lack the necessary skills and access to engage fully with digital technologies (European Commission, 2022). Seniors have become the generation most vulnerable to digital exclusion, facing barriers that challenge their ability to navigate the evolving digital landscape. They frequently lack the support, skills, and knowledge required to benefit from the digital opportunities available today (Bourgeois et al., 2019).

Figure 4 illustrates the disparity in internet usage among different age groups in Slovenia. The chart shows that younger age groups (16-24 and 25-34 years) report almost universal internet usage, while internet adoption decreases significantly among older age groups, particularly those over 65 (Mlakar, 2023). This visual supports the discussion on the digital divide and highlights the urgent need for targeted digital inclusion initiatives for seniors. It also suggests that, without intervention, even greater disparities could be expected in the next older age cohort.

Figure 4: Internet Usage Across Different Age Groups in Slovenia



Source: Adapted from Mlakar (2023).

This chapter delves into the digital divide in Slovenia, examining statistical data, key factors influencing senior inclusion and exclusion, patterns of access to technology, the role of technology in everyday life, and a comparative analysis of solutions implemented in other countries to address these challenges.

3.1 Data on digital divide

Building a strong digital knowledge base in Slovenia is not merely a matter of perspective but requires the development of appropriate strategies to engage older people in the process of digitalisation. Data serves as a valuable tool for visualizing the current state of the digital divide, reflecting patterns of web connectivity, user habits, and the underlying reasons behind these trends (Duh, 2024). According to the Statistical Office of the Republic of Slovenia, the digital environment in the country highlights both progress and persisting gaps in the digital divide, particularly when analysing differences between younger and older populations (SURS, 2023).

Statistics show that internet coverage in Slovenia stands at 90%, with widespread acceptance of digital technology across the population (SURS, 2023). However, the visibility and familiarity of digital interfaces primarily benefits younger generations, creating a stark contrast with the experiences of senior citizens (Mlakar, 2023). Among the 16-24 age group, 99% report daily internet use, with over 87% accessing the internet via smartphones. This high level of smartphone usage indicates that smartphones are integral to the online connectivity of younger individuals. Furthermore, 63% of young Slovenians are active on social media, reflecting a vibrant online culture centred around social networking and digital interactions (SURS, 2023).

Conversely, the older generation, particularly those aged 65-74, has shown considerable resistance to adopting and using the internet. Despite a steady increase in diverse internet users within this age group since the pre-pandemic period, only about 55% of the older population currently uses the internet (Eurostat, 2024). While this is a notable improvement, the divide persists; many older adults still find it challenging to fully utilize the internet. Most of them continue to rely on laptops or desktop computers for internet access, with 56% using laptops and 35% using desktop computers, highlighting a significant gap in smartphone use compared to younger generations (SURS, 2023).

This disparity underscores the urgent need to develop digital skills among older adults, enabling them to better utilise internet resources. The digital divide is not limited to basic access; it extends to the types of online activities in which individuals engage. In Slovenia, most young internet users rely on the internet for information about specific products or services and for consuming video content (77% and 69%, respectively). These activities are predominantly undertaken by the younger population, whereas older adults are far less likely to engage in these digital behaviours (SURS, 2023).

3.2 Access to technology

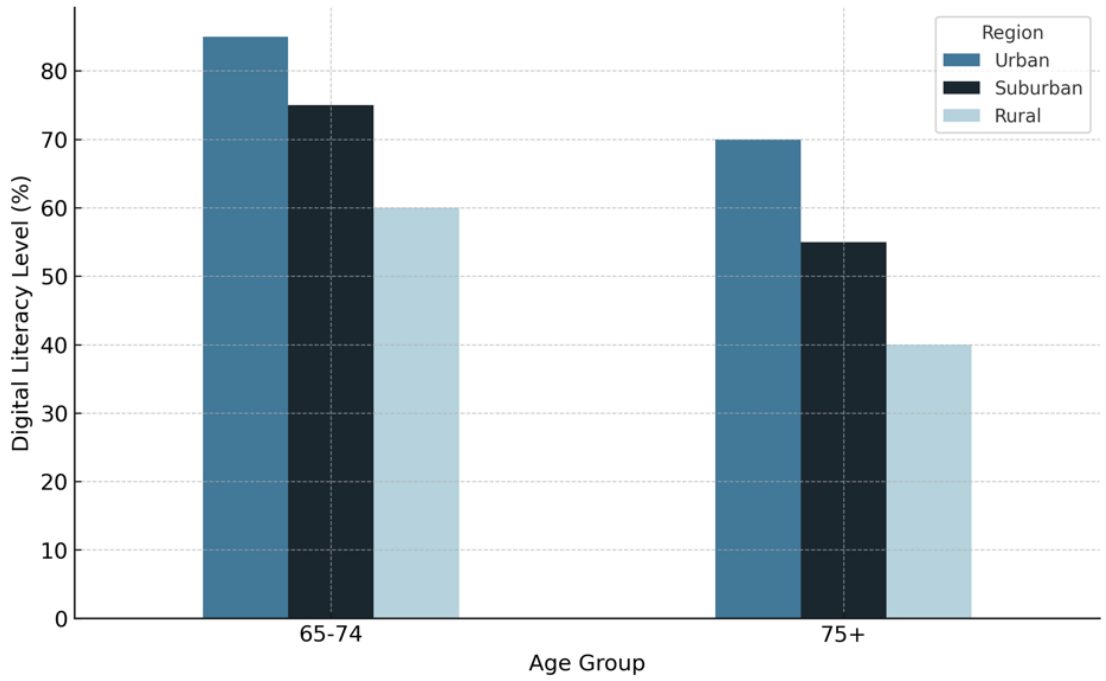
In Slovenia, access to technology among seniors varies significantly, influenced by factors such as internet connectivity, the availability of digital devices, and access to public facilities. While urban areas generally benefit from reliable internet services, rural regions

often face slower speeds and less dependable connections (European Commission, 2022). This disparity highlights the ongoing challenges in ensuring equitable digital access for all citizens (SURS, 2023). In addition, many seniors rely on outdated devices that may not support newer applications or services, further hindering their ability to engage fully in digital activities (European Union Agency for Fundamental Rights, 2023). Although the government has implemented programmes to improve broadband access in underserved regions, a noticeable difference in internet speeds and reliability between urban and rural areas remains evident (Duh, 2024).

Figure 5 compares digital literacy levels across different regions - urban, suburban, and rural - and two age groups (65-74 and 75+). The chart illustrates how regional differences impact digital literacy, highlighting that seniors living in rural areas consistently report lower digital skills compared to their urban and suburban counterparts.

To address these disparities, various initiatives have been introduced. Programmes offering affordable or subsidised devices, such as discounted tablets or laptops, have contributed to improving digital inclusion among seniors (European Commission, 2022).

Figure 5: Comparison of Digital Literacy Levels by Region and Age Group



Source: Adapted from European Commission (2022).

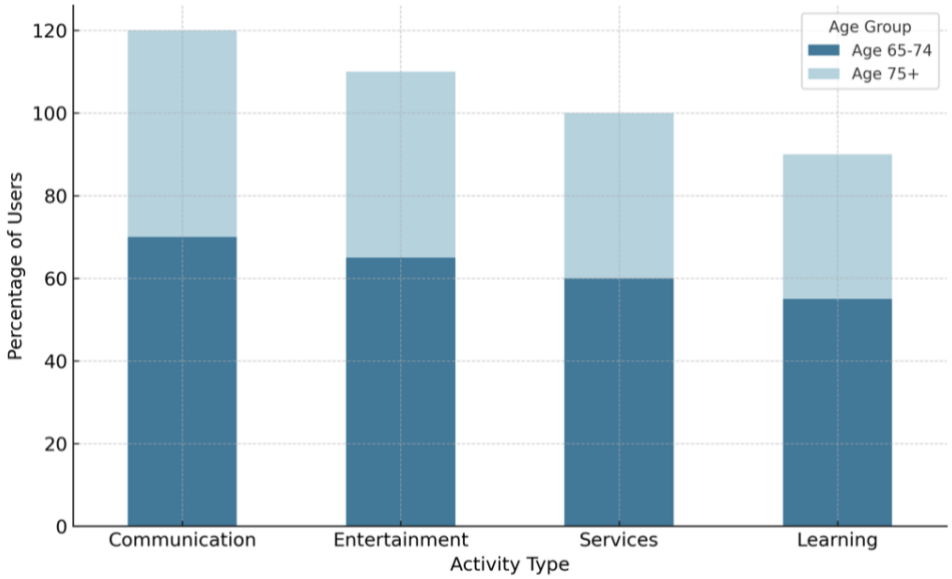
Furthermore, public access points, including community centres, libraries, and senior centres, play a crucial role for individuals without personal access to technology. These locations provide necessary equipment and create supportive environments where seniors can receive assistance, training, and encouragement to develop their digital skills (Duh, 2024).

3.3 Use of the technology in everyday life

The use of technology in everyday life among Slovenian seniors spans several important areas. For communication, many seniors use digital tools such as email, social media platforms, and messaging applications to stay connected with family and friends. However, they tend to use these tools less frequently and with less confidence than younger generations (Betts et al., 2017). Maintaining social connections through digital platforms is especially important for seniors to help reduce feelings of loneliness - a need that became even more critical during the COVID-19 pandemic (Garcia et al., 2021).

Figure 6 provides and overview of the various ways in which seniors utilise technology. The stacked bar chart breaks down activity types, showing that communication is the most common use, followed by entertainment, services, and learning. It highlights areas where gaps in digital engagement remain, reinforcing the need for targeted digital literacy programmes to address specific skills (European Commission, 2022).

Figure 6: Use of Technology in Everyday Life Among Seniors



Source: Adapted from European Commission (2022).

In terms of accessing services, there has been a noticeable increase in the number of seniors using online banking, healthcare services, and government portals – a trend that accelerated during the pandemic. This demonstrates the potential of digital tools to improve access to essential services. Nevertheless, many seniors still face significant challenges when navigating these platforms, underscoring the need for simpler design interfaces and better user support systems (Garcia et al., 2021).

Technology also plays an important role in senior's leisure and learning activities. Many enjoy streaming videos, reading news articles online, and pursuing hobbies through digital

means. In addition, a growing number of seniors participate in online learning platforms to develop new skills or pursue personal interests. Digital literacy programmes frequently focus on these areas, helping to encourage greater engagement and build senior's confidence in using technology (Betts et al., 2017).

3.4 Comparative analysis of solutions by countries

Different countries have implemented a range of strategies to address the digital divide among seniors. This chapter compares digital inclusion programmes across seven countries: Slovenia, Austria, Finland, Sweden, the United Kingdom, Estonia, and the Netherlands. Each nation has adopted unique approaches to enhance digital literacy and access among older adults, providing valuable insights into best practices and potential challenges.

Slovenia's "Simbioza" programme:

The Simbioza project in Slovenia, particularly its initiative Simbioza Mobiln@, was developed to bridge the digital divide by teaching seniors essential digital skills. The Simbioza programme employs an intergenerational learning model, engaging younger volunteers to train seniors in digital technologies. This approach not only improves digital literacy among older adults but also fosters social cohesion and mutual understanding between generations (Slovenian Ministry of Digital Transformation, 2022). Free workshops cover digital basics, internet safety, and the use of social media and communication apps.

Despite its impressive initial results, the project faced several challenges affecting its long-term sustainability. Firstly, maintaining continuous financial support proved difficult once the initial phase ended. Secondly, the programme relied heavily on volunteers, leading to inconsistencies in service delivery – especially in rural areas where volunteer retention was problematic (Simbioza Mobiln@, 2024). Furthermore, the lack of structured follow-up support limited the long-term impact, as many seniors did not receive ongoing assistance after completing the initial workshops. The rapid pace of technological change required constant updates to training resources – a significant hurdle for a volunteer-driven project (Simbioza Mobiln@, 2024).

In summary, while Simbioza is an inspiring and impactful initiative, funding limitations, volunteer dependency, and a lack of ongoing support ultimately affected its sustainability (Simbioza Mobiln@, 2024). The case highlights the importance of reducing stigma and improving accessibility to ensure that digital inclusion efforts reach all seniors, regardless of location (Slovenian Ministry of Digital Transformation, 2022).

Austria's "Digital Seniors" programme

Austria's Digital Seniors programme was created to help older adults build digital skills through practical, easy-to-follow training sessions across the country (Digital Seniors

Austria, 2021). It teaches seniors how to confidently use smartphones, tablets, and laptops for everyday tasks, with a strong focus on simple, personalised teaching methods (Digital Skills and Jobs Platform, n.d.). A key strength of the programme is its one-on-one support: trained digital companions assist seniors both online and in person, offering guidance tailored to individual needs (Digital Seniors Austria, 2021). Thanks to its national reach, the programme ensures that seniors in both urban and rural areas are not left behind (Digital Skills and Jobs Platform, n.d.).

Despite its successes, the programme faces some challenges. Recruiting and training enough qualified digital companions to meet the growing demand, particularly in rural regions, remains difficult. Additionally, the fast pace of technological change requires frequent updates to training materials and teaching methods (Digital Skills and Jobs Platform, n.d.).

Still, evaluations show promising results: more than 70% of participants reported feeling more confident using digital technologies after completing the programme (Digital Seniors Austria, 2021). Austria's example clearly demonstrates that personalised support, combined with strong national outreach, can truly empower seniors to become active and confident participants in the digital world (Digital Skills and Jobs Platform, n.d.).

Finland's "Seniors as digital learners" programme

Finland's programme focuses on practical, hands-on learning tailored to the everyday needs of older adults. This initiative offers free digital training that helps seniors navigate essential online services, such as healthcare and government portals, which have become increasingly important, particularly during the COVID-19 pandemic (Misheva, 2022). The programme's commitment to regularly updating training materials ensures its ongoing relevance and appeal.

The success of Finland's programme is evident: over 70% of participants reported improved digital skills and confidence, and digital engagement increased by 60% among trainees. Furthermore, feelings of social isolation decreased by 25% among participants. However, the programme has struggled with initial engagement, as seniors with very limited digital interest or skills found it difficult to remain engaged throughout the training. This suggests the need for more customised approaches that accommodate different starting points and motivation levels (Misheva, 2022).

Sweden's "Digital Seniors" programme

Sweden's Digital Seniors programme adopts a holistic approach by providing not only training but also the necessary digital devices, such as tablets. A unique focus on reducing social isolation using communication apps has been particularly impactful (Swedish Internet Foundation, 2021). By equipping seniors with tools for maintaining family and social connections, the programme addresses one of the most pressing issues among the elderly—social isolation.

Approximately 70% of participants reported reduced feelings of loneliness. However, the programme's sustainability is challenged by the high costs associated with device provision and the need for continuous technical support. Sustained funding and a robust support system are crucial for the long-term success of such initiatives (Swedish Internet Foundation, 2021).

United Kingdom's Digital inclusion strategy

The United Kingdom’s Digital Inclusion Strategy adopts a highly personalised approach, deploying "digital champions" to offer one-on-one support to seniors. This method, implemented through initiatives such as the Good Things Foundation, has proven highly effective in helping older adults overcome barriers like fear of technology and lack of confidence (Good Things Foundation, 2021). Since 2015, over 30,000 seniors have been reached, with 85% reporting increased confidence in using digital tools (Good Things Foundation, 2021).

However, the strategy also faces challenges regarding scalability and sustainability. Providing consistent support and retaining volunteers require significant investment and ongoing commitment. The varied digital literacy levels among participants necessitate highly customised training, increasing resource demands. This highlights the need for a balanced approach that combines personalised support with broader, scalable solutions (Good Things Foundation, 2021).

Estonia's “Digital skills for seniors” programme

Estonia’s Digital skills for seniors programme focuses on leveraging community resources, such as libraries and community centres, to create accessible training environments (Estonian Digital Skills Report, 2021). By collaborating with familiar and supportive institutions, the programme successfully reaches a broad audience and offers training in essential digital skills and online safety.

Nevertheless, the programme struggles with high dropout rates, often due to the perceived complexity of the training materials. Outreach to sparsely populated rural areas remains limited, suggesting that a more tailored and flexible approach is necessary to meet diverse needs (Estonian Digital Skills Report, 2021).

Netherlands' “SeniorWeb” programme

The Netherlands’ SeniorWeb programme adapts a hybrid model, combining online courses with in-person workshops. This flexible approach caters to varying learning preferences and promotes engagement (Dutch Digital Inclusion Report, 2021). The programme focuses on practical digital skills, such as online shopping, communication, and accessing e-government services, and works closely with local libraries to extend its reach.

However, like many other programmes, SeniorWeb faces challenges in reaching the most isolated seniors and ensuring financial sustainability to maintain free services. The Netherlands' experience highlights the critical importance of continuous community engagement and stable funding sources for the long-term success of digital inclusion efforts (Dutch Digital Inclusion Report, 2021).

3.5 Key takeaways and lessons for Slovenia

Examining how different countries have sought to close the digital gap for seniors provides important insights for Slovenia. First, it is clear that programmes focusing on **teaching practical skills** tailored to the everyday needs of older adults are very effective. For instance, Finland's programme has been successful because it offers **free, hands-on training** that helps seniors use digital tools for practical tasks such as managing online banking or accessing healthcare services (Misheva, 2022). By making technology immediately useful, the programme encourages seniors to continue engaging with digital tools in their daily lives. Similarly, Austria's Digital Seniors programme focuses on empowering seniors by offering practical knowledge on how to use applications like online communication, accessing e-services, and information retrieval (Digital Seniors Austria, 2021). Both examples show that when digital training is directly relevant to seniors' real-life needs, it increases their engagement and willingness to learn.

During the COVID-19 pandemic, many countries - including Slovenia – offered free digital courses for older adults to help them stay connected and access essential services online. While these initiatives were well-intentioned, a critical factor was often overlooked. Many seniors could not practise or apply what they had learned due to a lack of access to suitable equipment, such as computers or tablets, and insufficient ongoing support (Garcia et al., 2021). Even when seniors were motivated to participate, barriers such as socioeconomic challenges, fear of technology, and limited digital infrastructure prevented many from making full use of the training opportunities. This highlights the importance of not only providing education but also ensuring that seniors have the necessary tools and continued assistance to apply their new skills effectively.

Providing **access to digital devices and offering ongoing support** is crucial for keeping seniors engaged and reducing social isolation. Sweden's Digital Seniors programme exemplifies this approach. It not only provides tablets but also offers training focused on using social and communication apps, helping seniors maintain contact with family and friends (Swedish Internet Foundation, 2021). This combination of equipment provision and skill development has significantly reduced feelings of loneliness among participants. Similarly, Estonia and the Netherlands demonstrate the value of leveraging community resources, such as libraries and community centres, to provide accessible digital training and support. Estonia's programme improved digital skills by 22% within its first year by using local facilities for training, while the Netherlands' SeniorWeb programme achieved a 75%

improvement in digital skills by offering both online and in-person learning options (Estonian Digital Skills Report, 2021; Dutch Digital Inclusion Report, 2021).

Finally, **addressing the emotional and cultural barriers** that prevent seniors from embracing technology is essential. The United Kingdom's Digital Inclusion Strategy employs "digital champions" who provide one-on-one support, helping seniors overcome their fear of technology and build confidence in their abilities (Good Things Foundation, 2021). This personalised approach has been highly effective, with 85% of participants reporting increased digital confidence. Slovenia's own Simbioza programme also demonstrates the value of intergenerational learning, where younger volunteers teach digital skills to seniors. This method not only improves seniors' digital competencies but also fosters stronger social connections across generations and reduces stigma associated with digital technologies (Slovenian Ministry of Digital Transformation, 2022).

In summary, these examples suggest that Slovenia would benefit from adopting a comprehensive approach that **combines practical training, accessible digital tools, and strong ongoing support systems**. Such a strategy would help ensure that all seniors - regardless of their background or location - can learn to use digital technologies confidently and effectively. This would not only enhance digital skills but also help reduce social isolation and foster a more inclusive and connected community. The Table 1 below provides a structured overview of the great practices, challenges, and outcomes of the analysed programmes. With comparative analysis it was easier to identify lessons and recommendations relevant for Slovenia, so we can build a more digitally inclusive society.

Table 1: Comparative analysis of programmes by countries.

Country Programme name	**Great practices**	**Problems**	**Statistics**	**Duration**
Slovenia Simbioza Mobiln@	Intergenerational learning model involving younger volunteers. Free workshops on basic computer skills, internet safety, and the use of social media and communication apps.	Limited availability of workshops in rural areas. Reluctance to participate due to stigma surrounding digital illiteracy.	80% increase in confidence using digital tools. Digital literacy improved by 30% in urban areas. Participants felt less isolated and more connected.	Started in 2011; runs annually.

table continues

Table 1: Comparative analysis of programmes by countries (continued)

Country Programme name	**Great practices**	**Problems**	**Statistics**	**Duration**
Austria Digital Seniors	Personalised one-on-one support through digital companions, focusing on practical skills like communication, e-services, and online safety, with national reach including rural areas.	Difficulties in recruiting and retaining enough digital companions, especially in rural areas. Rapid technological changes require continuous updating of training content.	70%+ of seniors reported significantly greater confidence in using digital technologies. High satisfaction rates with personalised learning approach.	Launched in 2021; ongoing.
Finland Seniors as digital learners	Free digital training on practical applications. Hands-on experience with smartphones and tablets. Continuously updated training materials to match technological advancements.	Setup challenges due to varied skill levels among participants. Difficulty maintaining long-term engagement.	Over 70% of participants improved digital skills, confidence. Engagement increased by 60%. 25% reduction in feelings of social isolation.	Launched in 2018; currently ongoing.
Sweden Digital Seniors	Provision of tablets alongside comprehensive training. Emphasis on social and communication apps to reduce isolation. Ongoing support, adapting content to evolving participant needs.	High cost of maintaining hardware and providing individualised training. Difficulties with adoption of advanced digital features.	Social isolation reduced by 30%. Digital literacy increased by 18% within the first year. Around 65% of seniors felt more connected to their communities through digital tools.	Started in 2016; ongoing.
UK Digital Inclusion Strategy	Personalised one-on-one support to seniors, building confidence and skills in using digital technologies. Focus on addressing individual barriers.	Difficulty sustaining volunteer engagement. High need for customised training sessions due to varying digital literacy levels. Retention of digital champions remains a challenge.	Digital literacy improved by 25%. 85% of participants reported increased confidence in using digital tools. 50% increase in use of online services.	Initiated in 2015; ongoing with continual volunteer recruitment and training.

table continues

Table 1: Comparative analysis of programmes by countries (continued)

Estonia Digital Skills for Seniors	Focus on essential digital skills and online safety. Collaboration with libraries and community centres to provide accessible learning environments.	High dropout rate due to perceived complexity of training programmes. Limited outreach in sparsely populated rural areas.	Digital literacy improved by 22% in the first year. Over 65% of participants reported increased online activity.	Launched in 2017; ongoing with community-based sessions.
Netherlands SeniorWeb	Combination of online courses and in-person workshops focused on practical digital skills. Partnerships with local libraries to expand reach.	Difficulty reaching the most isolated seniors. Funding challenges in maintaining free services.	75% seniors improved digital skills within six months. Over 50% now use digital tools more regularly.	Established in 1996; ongoing with both online and in-person formats.

Sources: own work.

4 METHODOLOGY

This chapter outlines the research methodology, combining both theoretical and empirical approaches. The theoretical part includes a comprehensive literature review focused on digital literacy among the elderly. The empirical part consists of secondary data analysis, using sources such as SURS and Eurostat, as well as mini case studies of best practices across the European Union (EU). In addition, a primary in-depth interview with Ana Petrič provides expert insights into the real-life challenges faced by older adults in Slovenia. Together, these methods aim to explore the digital divide affecting the elderly and propose practical solutions to improve digital inclusion in Slovenia.

4.1 Purpose and goals

The aim of my research is to explore the challenges faced by the elderly in an increasingly digital world. Living in the same house, above my grandparents, I have witnessed first-hand the difficulties they encounter with digital technologies due to a lack of knowledge and practice. This personal experience has inspired me to investigate how seniors can better overcome these barriers and become more integrated into today's digital society. By addressing these challenges, I hope to foster greater understanding and encourage solutions that enhance digital inclusion among the elderly in Slovenia. This would not only enable better access and contribution across generations, but also promote the sharing of knowledge and best practices between younger and older citizens. Furthermore, the findings will contribute to a broader understanding of the digital divide specific to Slovenia.

The goals of my master's thesis are:

- To review the main challenges faced by older adults regarding digital skills and knowledge.
- To examine current best practices across the EU.
- To evaluate the effectiveness of currently implemented programmes in Slovenia.
- To determine the effect of the COVID-19 on the elderly's access to critical infrastructure.
- To propose solutions for reducing the age-related digital divide in Slovenia.

The research questions guiding this thesis are:

What are the most common challenges and barriers faced by older adults in Slovenia when using digital technologies?

How does digital inclusion vary between elderly populations in urban and rural areas of Slovenia?

What are the strengths and weaknesses of current digital inclusion programmes targeting seniors in Slovenia?

Which best practices from other European countries could be successfully adapted in Slovenia to promote digital literacy among seniors?

4.2 Methodology

The methodology of this thesis consists of both theoretical and empirical parts. The theoretical part involves a literature review and conducting research on the digital literacy of elders, as presented in Chapter 2.

The empirical part is based on a combination of primary and secondary data. Secondary data was used to compile Chapter 3, examining the extent of digital use among the elderly through established statistical sources, such as SURS and Eurostat. For this research, mini case studies were critically evaluated, showcasing projects and practices from various European countries. These initiatives aim to support seniors in acquiring digital literacy skills and overcoming the challenges they face in an increasingly digital world. Mini case studies are particularly valuable when seeking deeper insights into specific problems, as they provide an overview and enable comparisons of best practices. In turn, they offer ideas on how similar challenges could be addressed and improved in Slovenia.

To complement the secondary data analysis, a primary in-depth expert interview was conducted with Ana Petrič, providing first-hand insights into the challenges experienced by older adults in Slovenia. This interview offers a more comprehensive context to the challenges and describes real-life situations faced by seniors. The purpose of using an expert interview was to uncover the interviewee's insights, experiences, and knowledge in the field (Monke, 2022).

4.3 Primary data collection and analysis: in-depth interview with Ana Petrič

When considering who could provide the most valuable insight into the current situation of the elderly and their use of technology, Ana Petrič immediately came to mind. With her extensive experience and deep understanding of this field, she was the ideal person to discuss this topic. Ana Petrič, a Master of Social Work and former Director of the DEOS Centre for the Elderly in Notranje Gorice, has a wealth of experience working directly with seniors. Throughout her career, she has been dedicated to improving the quality of life for elderly individuals, particularly those within her care. Beyond her direct work, she has been a passionate advocate for the rights of older adults, frequently speaking out about their struggles and the systemic lack of government support and funding.

I have had the privilege of meeting Ms. Petrič in person, hearing her insights, and being inspired by her passion and commitment to improving the lives of the elderly.

The purpose of this interview was to learn from Ms. Petrič's extensive experience and knowledge, particularly regarding the digital divide affecting the elderly in Slovenia. The aim was to explore the main challenges faced by seniors, hear her observations, and gather her recommendations for improving digital inclusion for older adults.

Her insights provided valuable perspectives on how we can better support elderly individuals in accessing and using digital technologies, ultimately contributing towards the creation of a more inclusive digital society.

4.4 Secondary data collection and analysis: Mini case studies

The secondary data analysis in this thesis is based on a review of established statistical data and reports from credible sources, including the Statistical Office of the Republic of Slovenia and the European Commission’s Digital Economy and Society Index (DESI). These sources provide a comprehensive overview of the current state of digital inclusion among elderly populations in Slovenia and highlight both the progress made and the remaining gaps in digital literacy, particularly when comparing urban and rural areas.

The data highlights a substantial digital divide along generational lines, with the elderly population particularly affected. Although internet coverage in Slovenia is relatively high, with approximately 90% of households having internet access, this does not necessarily translate into digital competence. Seniors, in particular, often lack the digital skills necessary to navigate online platforms effectively. This divide becomes even more pronounced when examining access to newer technologies, such as smartphones and tablets, which are less commonly used by seniors compared to younger demographics.

In addition, the DESI report identifies that barriers to digital inclusion for the elderly in Slovenia are multifaceted. These barriers include not only limited access to technology but also a lack of digital literacy training specifically tailored to the needs of older adults.

Financial constraints further exacerbate the situation: many seniors, particularly those living in lower-income or rural settings, struggle to afford the necessary devices and internet subscriptions. This financial aspect of the digital divide is a critical obstacle, as it prevents seniors from accessing digital barrier is a critical obstacle, as it prevents seniors from accessing digital tools that are increasingly essential for everyday activities, such as banking, healthcare, and maintaining family connections.

Moreover, psychological and social barriers significantly hinder digital adoption among older adults. Some seniors feel overwhelmed by the rapid pace of technological advancements and lack confidence in their ability to learn new digital skills. Others may not perceive digital skills as relevant to their lives, leading to reluctance or resistance towards technology use. These insights from the secondary data frame the key challenges that Slovenia must address in fostering digital inclusion for its ageing population. By identifying and understanding these barriers, it becomes possible to propose more effective strategies to improve digital literacy and empower older adults to participate fully in the digital society.

5 FINDINGS

This chapter presents the main findings from the comparative analysis of digital inclusion initiatives for seniors across European countries. The findings are structured into three key areas: an overview of the case study results, best practices identified from successful programmes, and proposed solutions to enhance digital literacy and inclusion among elderly populations in Slovenia.

5.1 Summary of interview with Ana Petrič

The interview with Ana Petrič, former Director of the Senior Centre in Slovenia, provided valuable insights into the digital challenges faced by older adults, based on her extensive experience in the field. She outlined the most common barriers seniors encounter when engaging with technology, shared examples of successful approaches, and provided clear recommendations for improving digital inclusion in the future. The complete transcript of the interview is provided in Appendix 2.

5.1.1 Challenges seniors face in the digital world

Fear and lack of confidence

One of the most significant barriers seniors' faces is a general lack of digital awareness and a deep-rooted fear of technology. Many elderly individuals have never used digital tools before and feel overwhelmed when trying to navigate them. "*Many seniors are not familiar with digital tools and are often afraid of them, fearing they won't be able to learn*," Petrič

explains. "*This fear is only made worse by the impatience and lack of support they sometimes receive from their surroundings.*"

This connects to what we've seen in theory – many older people feel like technology just isn't meant for them. In Chapter 2.4, this kind of fear and lack of confidence is described as a key reason why seniors avoid digital tools. The numbers in Chapter 3.1 back this up too – almost half of Slovenians aged 65–74 still don't use the internet, which shows how big this barrier really is.

Technology that is not built for them

In addition to psychological barriers, there are also structural and design challenges. Technology is often not designed with the needs of elderly users in mind. "*Apps and websites frequently have small buttons, complex interfaces, and lack clear instructions, making them intimidating and confusing for seniors*," she notes. As essential services such as banking, healthcare, and public administration move online, seniors in rural areas are particularly vulnerable.

This matches what's discussed in Chapter 2.3 and 2.4 – even if older people want to use digital services, many tools are too complicated or not friendly to their needs. Complex design, small text, and too many options can easily discourage someone who's just learning.

Isolation in rural areas

The digital divide is even more noticeable in rural communities. "*In smaller towns, in-person services are disappearing, and seniors are left behin*d," Petrič warns. She also emphasised that the gap between rural and urban areas continues to grow, leaving elderly residents of smaller towns with fewer opportunities. This growing digital exclusion means that many elderly people struggle to access the services they need to maintain their independence and quality of life.

This issue is highlighted clearly in Chapter 3.2 – people in rural areas have less access to technology and support, which makes learning even harder. Seniors in these areas often rely on outdated devices or slow internet, which only makes them feel more left out.

Online safety concerns

Another critical issue is cybersecurity. Many seniors are unaware of online threats and can easily fall victim to scams, phishing, and fraud. "*They often lack the digital literacy needed to recognise malicious activities, making them easy targets for online scammers*," Petrič emphasises. Without proper education and ongoing support, these risks further discourage seniors from embracing digital technologies altogether.

Chapter 2.5.1 and 2.6 talk about this problem too – not knowing how to stay safe online is one of the main reasons older people give up on using the internet. They don't feel secure, and without simple explanations or help, it's easier for them to just avoid it altogether.

5.1.2 Positive steps towards digital inclusion

Learning from younger generations

Despite these challenges, several promising initiatives are making a difference. One successful approach has been the use of intergenerational learning, where younger people teach seniors how to use digital tools. "*Encouraging younger people to teach seniors has been incredibly successful. It not only improves digital literacy among the elderly but also fosters empathy and understanding between generations*," says Petrič. This method strengthens community bonds while simultaneously addressing the digital skills gap.

This idea works – and we've seen proof of it. In Chapter 3.4, the Simbioza programme shows that when younger people help older ones, seniors feel more confident. In fact, over 80% said they felt better using technology after. It's a great way to connect generations and make learning fun and friendly.

Workshops that empower

Another effective strategy has been hands-on training through workshops. Petrič has collaborated with organisations such as Simbioza to offer mobile classrooms and tailored learning experiences for seniors. "*Workshops have proven to be highly effective. Seniors show significant improvement in their basic digital skills, but follow-up support remains crucial,*" she explains. Without continued reinforcement, the skills gained during one-off workshops can diminish over time, leaving seniors back at square one.

Chapter 3.5.3 and 6.2.2 mention this exact problem – workshops work well, but only if there's ongoing help. Without regular practice or someone to ask, it's easy to forget what was learned. Long-term mentorship and support make all the difference.

5.1.3 What needs to change?

Based on her extensive experience, Petrič offers several key recommendations for making digital tools more accessible and user-friendly for seniors:

1. Inclusive design: policymakers and technology developers should involve seniors in the design phase of digital tools. "*We need to make sure that apps and websites have simple interfaces, larger text, and clear navigation to accommodate elderly users*," she suggests. This matches what's explained in Chapter 2.4 – seniors need tools that feel

intuitive and don't overwhelm them. Simple changes like bigger buttons and clearer layouts can make a big difference.

2. Ongoing support: long-term support programmes are essential to maintain seniors' digital confidence. "*Seniors need continuous guidance to stay comfortable with digital tools, whether from dedicated volunteers or family members,*" says Petrič. This is exactly what Chapter 6.2.2 recommends – building long-term mentorship programmes that don't leave seniors to figure things out on their own.
3. Safety education: greater efforts should be placed on teaching seniors about online safety. "*They need to know how to recognise scams and have access to resources they can turn to if they feel unsure,*" she emphasises. In Chapter 3.5.5, this is marked as a key priority. Teaching seniors what to look out for online builds their confidence and helps them feel more in control.
4. Government and community support: sustainable funding is critical to ensure long-term success. "*We can't just rely on external funding or short-term projects. Digital inclusion for seniors should be a long-term priority*," she argues. Chapter 6.2.6 says the same – without stable funding, even the best programmes can't last. Long-term investment is the only way to make real progress.

5.1.4 Moving forward together

The digital divide among Slovenia's elderly population remains a significant challenge, but it is one that can be overcome with the right strategies. By fostering intergenerational learning, improving the accessibility of digital tools, and providing ongoing support, it is possible to empower seniors to participate more fully in the digital world. As Ana puts it, "*We need a holistic approach that integrates practical training, accessible technology, and ongoing support. Only then can we create a truly inclusive digital society where no one is left behind.*"

This brings together everything the thesis has covered so far. Chapter 6.1 shows that when we combine training, access to devices, regular support, and community involvement, the results are much stronger. And since older people will make up over 32% of Slovenia's population by 2100 (Chapter 2.2), this isn't just a tech issue, it is a social one – it's something we need to plan for now.

5.2 Results of case studies

The comparative analysis of digital inclusion programmes for seniors across seven European countries reveals a range of approaches aimed at increasing digital literacy and access. While each initiative is designed to address the specific challenges of its national context, common themes emerge regarding their effectiveness, viability, and scalability. This section provides a critical evaluation of these programmes, identifying both their successes and limitations.

5.2.1 Effectiveness of learning approaches

One of the most striking findings from the mini case studies is that practical, needs-based training is a key driver of success. Programmes that focus on real-life applications—such as accessing online banking, government services, healthcare, or communicating with family—consistently achieve higher engagement and retention rates.

Finland's Seniors as digital learners and Austria's Digital Seniors demonstrate that when digital skills training aligns with seniors' everyday needs, participation rates increase and older adults feel more confident in using digital tools. This is particularly evident in Finland, where over 70% of participants reported improved digital literacy and confidence, with a 60% increase in digital engagement after the training (Misheva, 2022).

However, a challenge emerges regarding varied baseline skills. In both Finland and Austria, seniors with little prior exposure to technology often struggled to keep up, leading to lower engagement levels. This suggests that a one-size-fits-all approach is insufficient and that a tiered learning system—categorising seniors based on their prior experience—might enhance overall effectiveness.

Slovenia's Simbioza initiative offers a unique intergenerational model, where young volunteers teach seniors digital skills. This socially inclusive approach not only improves digital literacy but also helps to reduce stigma around digital illiteracy (Slovenian Ministry of Digital Transformation, 2022). However, its reliance on volunteers has led to inconsistencies in service delivery, particularly in rural areas where maintaining a stable volunteer base is more difficult (Simbioza Mobiln@, 2024). This raises concerns about the long-term sustainability of programmes that depend heavily on unpaid educators.

5.2.2 Viability and long-term support challenges

Although many of the examined programmes have demonstrated initial success, sustainability remains a recurring issue, particularly concerning funding, volunteer retention, and the provision of ongoing support for seniors after completing training.

Programmes such as Sweden's Digital Seniors and Estonia's Digital Skills for Seniors show that access to digital devices significantly enhances learning outcomes, especially when combined with structured training. Sweden's programme, which provides seniors with tablets and trains them in using communication apps, has led to a 30% reduction in social isolation (Swedish Internet Foundation, 2021). This proves that access to technology must go hand-in-hand with digital literacy efforts.

However, providing hardware creates financial sustainability challenges. Sweden's initiative, while effective, struggles with funding for device maintenance, updates, and technical support (Swedish Internet Foun., 2021). Without continuous investment, there is a

risk that seniors will eventually stop using the technology as it becomes outdated or when technical problems arise.

A similar issue appears in the UK's Digital Inclusion Strategy, which relies on one-on-one digital champions to provide personalised support. Although 85% of participants reported increased confidence in using digital tools, this model is resource-intensive and difficult to scale (Good Things Foundation, 2021). Maintaining a large and motivated network of trained volunteers presents a significant logistical challenge.

Slovenia's and Estonia's programmes, despite their successes, highlight another gap: the lack of follow-up support. Many seniors receive initial training but lack ongoing technical assistance, making it difficult for them to adapt to evolving technological changes. This suggests that training programmes need to incorporate a built-in mechanism for sustained digital education, such as community-based digital help centres or regular refresher workshops.

5.2.3 Rural vs. urban accessibility disparities

A notable challenge across multiple case studies is the geographical divide in digital literacy efforts. While urban areas benefit from better infrastructure, easier access to training centres, and a higher concentration of volunteers, rural communities often face barriers to participation due to logistical challenges and weaker internet connectivity.

Austria's Digital Seniors and Estonia's Digital Skills for Seniors have encountered difficulties reaching seniors in rural areas, where mobility issues and limited digital infrastructure restrict access to training sessions.

The Netherlands' hybrid model (SeniorWeb), which allows seniors to choose between in-person workshops and online courses, offers greater flexibility. However, disparities in digital literacy persist even within urban settings. The UK's Digital Inclusion Strategy found that seniors from lower socioeconomic backgrounds were less likely to have access to personal computers or broadband internet, even when training opportunities were available.

5.2.4 Addressing emotional and psychological barriers

Beyond infrastructure and training methods, the mini case studies highlight the critical role of emotional and psychological barriers in shaping digital adoption among seniors.

Fear of technology remains a significant obstacle in many contexts, particularly in countries where digitalisation has rapidly outpaced generational adaptation. Slovenia's Simbioza initiative shows the effectiveness of social learning models, where intergenerational interactions help to normalise the use of technology among older adults.

Similarly, Sweden's Digital Seniors programme, which integrates social communication apps into digital training, has been particularly successful in reducing feelings of social isolation and fostering a sense of connection and community among participants.

5.3 Best practices for Slovenia's digital inclusion efforts

From the evaluation of mini case studies, several key best practices emerge that contribute to the success of digital literacy initiatives for seniors. While each programme has been tailored to its national contexts, the most effective strategies focus on practical, needs-based learning, access to technology, sustained support, community-based engagement, and addressing psychological barriers. This section critically examines these best practices and their implications for Slovenia's digital inclusion efforts.

5.3.1 Practical, needs-based learning

One of the most effective approaches observed across multiple programmes is hands-on, needs-based training that focuses on real-life applications rather than abstract digital concepts.

Finland's initiative demonstrates that training tailored to practical applications – such as online banking, healthcare services, and digital communication - leads to higher engagement and retention rates. Similarly, Austria's Digital Seniors has emphasised functional digital literacy, particularly online banking and email use, resulting in high satisfaction rates with personalised learning approach (Digital Seniors Austria, 2021).

However, a critical limitation of this approach is the assumption of a homogeneous level of digital readiness among participants. Many seniors begin training with widely varying skill levels. Finland's experience highlights this issue, as seniors with low initial interest or exposure to digital tools struggled to remain engaged, suggesting that a tiered, skill-based learning structure could enhance effectiveness.

Another challenge is that many seniors experience cognitive decline or difficulty adapting to new technologies. Programmes must incorporate adaptive teaching techniques, such as slower-paced lessons, repetition, and interactive exercises, to ensure that participants retain their skills over time.

5.3.2 Combining digital skills training with access to devices

Digital literacy efforts are most successful when training is combined with direct access to digital devices, helping to reduce technological barriers for seniors.

Sweden's Digital Seniors programme provides participants with tablets and training on their use, resulting in a 30% reduction in social isolation and a significant increase in digital

engagement (Swedish Internet Foundation, 2021). Similarly, Estonia's Digital Skills for Seniors programme utilises libraries and community centres to offer a trusted, familiar environment where seniors can access both devices and digital literacy workshops.

Despite these successes, hardware-dependent programmes present sustainability challenges. Sweden's initiative, for instance, faces funding constraints related to device maintenance and upgrades, raising concerns about long-term viability. A potential solution is the establishment of public-private partnerships, where corporate sponsors – such as technology companies or telecom providers - subsidise digital devices for seniors, as seen in initiatives Estonia and the Netherlands.

Moreover, providing devices alone is insufficient—ongoing technical support is critical. Without accessible assistance, seniors may struggle with updates, security issues, or device malfunctions, leading to eventual technology abandonment.

5.3.3 Sustained Support and Follow-Up Learning

One of the most common weaknesses across the programmes is the lack of continuous support after initial training. Many seniors require reinforcement of digital skills to maintain their confidence and competence.

The UK's Digital Inclusion Strategy addresses this challenge by incorporating digital champions—trained volunteers who offer one-on-one support—helping seniors overcome fear and prevent skills deterioration. The Netherlands' SeniorWeb programme also offers both online and in-person training options, allowing seniors to return for refresher courses as needed, resulting in a 75% improvement in digital skills over time (Dutch Digital Inclusion Report, 2021).

However, personalised support models such as the UK's face scalability issues as volunteer retention can be difficult, and training highly individualised programmes requires significant financial and human resources.

A potential best practice for Slovenia could be the development of community-based digital mentoring programmes, where seniors can attend periodic refresher workshops and access helplines supported by trained volunteers and professionals.

5.3.4 Leveraging community-based and intergenerational learning

Programmes that embed digital training within local communities and encourage intergenerational learning tend to achieve higher participation and engagement rates.

Estonia's Digital Skills for Seniors programme partners with libraries and community centres, leveraging existing infrastructure to provide accessible learning environments.

Slovenia's Simbioza initiative also successfully employs an intergenerational learning model, where younger volunteers mentor seniors in digital tools. This method not only improves digital skills but also helps reduce stigma around digital illiteracy and strengthens social connections across generations.

However, these programmes often depend on volunteer networks, which can present challenges regarding scalability and sustainability. In Slovenia, Simbioza has faced difficulties in maintaining volunteer consistency, particularly in rural areas. This suggests the need for structured incentives, such as certification schemes for student volunteers or financial support for long-term facilitators.

Additionally, community-based initiatives require localised adaptations—rural seniors may benefit from on-site, mobile training units, while urban seniors might prefer library-based digital hubs.

5.3.5 Addressing psychological barriers and digital confidence

Beyond technical skills, many seniors struggle with fear, anxiety, and resistance towards technology. Programmes that incorporate confidence-building strategies achieve higher retention and success rates.

The UK's Digital Inclusion Strategy recognises that fear of technology is a major barrier and addresses it through peer-led support, helping seniors gain confidence in a non-judgmental environment. Sweden's Digital Seniors programme, by integrating social communication apps like Skype and WhatsApp, has encouraged digital adoption by linking technology use to meaningful social interactions.

Building confidence, however, requires long-term engagement. One-time workshops are rarely sufficient to eradicate digital anxiety. Follow-up programmes and peer mentorship play a crucial role in sustaining progress.

For Slovenia, incorporating a dedicated "confidence-building" component within digital training programmes - such as peer discussion groups and testimonial-based encouragement - could significantly increase participation and long-term engagement rates.

5.4 Key takeaways for Slovenia

Practical, real-life digital training yields the most effective results. Programmes should prioritise essential online tasks—such as banking, communication, and healthcare access—to ensure immediate relevance for seniors. Providing digital devices alongside training significantly enhances learning outcomes, but requires sustainable funding models to prevent long-term maintenance and accessibility challenges.

Ongoing support and refresher courses are crucial; without consistent follow-up, skills tend to fade and engagement levels decline. Community-based and intergenerational learning models have proven effective in encouraging participation, yet they require structured volunteer management and incentive systems to ensure long-term viability. Addressing psychological barriers is equally important as teaching technical skills—building digital confidence must become a core component of Slovenia's digital inclusion efforts.

By integrating these best practices, Slovenia can create a more inclusive, accessible, and sustainable digital literacy programme for seniors, helping to bridge the digital divide and ensure active digital participation for years to come.

6 DISCUSSION

The findings of this study highlight significant challenges and opportunities in bridging the digital divide among older adults in Slovenia. By analysing best practices across Europe, this chapter discusses the most effective strategies for improving digital inclusion, identifies critical barriers, and provides policy recommendations for sustainable interventions.

6.1 Summary of main findings

The analysis of digital inclusion programmes for seniors across Europe reveals key lessons regarding what strategies are most effective. The most successful initiatives focus on practical, real-life training - teaching seniors how to use the internet, access government services, engage with healthcare systems, and stay connected with family. When training aligns with daily needs, engagement and retention rates rise significantly. However, not all seniors begin from the same starting point. Some are complete beginners, while others require assistance with more advanced tasks. A tiered training approach, where courses are tailored to different skill levels, ensures that no one feels overwhelmed or left behind.

Sustainability remains a major challenge. Many programmes demonstrate early success but struggle to maintain funding, retain volunteers, and provide ongoing support. Sweden's Digital Seniors programme, which supplies tablets to older adults, has notably helped reduce social isolation. However, maintaining and updating these devices is costly. Similarly, the UK's Digital Champions model, offering valuable one-on-one mentoring, proves effective, but it is difficult to scale due to its heavy reliance on volunteer networks. Slovenia's future strategy should therefore incorporate structured, long-term mentorship networks that do not depend entirely on unpaid support.

Accessibility presents another significant barrier. Seniors living in rural areas face greater challenges compared to their urban counterparts - limited internet access, fewer training centres, and transportation difficulties all restrict participation in workshops. Programmes that combine in-person and online learning offer promising solution, yet many countries

continue to struggle with outreach to remote areas. Beyond infrastructure issues, many seniors also face psychological barriers such as fear of technology. Concerns about making mistakes, being scammed, or looking "stupid" prevent older adults from even attempting to engage with digital tools. Slovenia's Simbioza initiative, pairing young volunteers with seniors, has helped to break down some of these barriers. Nevertheless, like many volunteer-driven programmes, it faces challenges regarding consistency and long-term sustainability.

For Slovenia to create a scalable, long-term digital inclusion strategy, several key steps are essential. Tiered training programmes should be introduced to match seniors with appropriate learning pathways based on their existing skill levels. A national mentorship network - including digital help centres, helplines, and peer mentors - would provide ongoing support, ensuring that seniors maintain confidence after their initial training. Affordable device access is also crucial: tablet lending schemes, subsidies, or public-private partnerships could make digital tools more accessible to older adults. To better reach rural populations, mobile digital training units could deliver education directly to remote communities. Importantly, building digital confidence must be central to all initiatives. Creating a supportive, low-pressure environment where seniors feel safe to make mistakes will be key to encouraging long-term engagement.

Finally, none of these efforts will succeed without stable, long-term funding. A collaborative approach involving government investment, private sector partnerships, and local community support will be essential to maintain the continuity and effectiveness of digital inclusion programmes.

By combining structured learning, sustained mentorship, accessible technology, rural outreach, and secure funding, Slovenia has the opportunity to become a leader in digital inclusion – ensuring that seniors not only gain digital skills but continue using them to improve their quality of life.

6.2 Proposed solutions for Slovenia

The digital divide remains a significant challenge for Slovenia's elderly population, with many seniors struggling to adapt to rapidly evolving technologies. As highlighted by Ana Petrič, barriers such as fear of technology, inaccessible digital design, lack of continuous support, and cybersecurity concerns prevent seniors from fully participating in the digital world. Nevertheless, successful intergenerational learning models, hands-on training workshops, and ongoing support initiatives have shown promising results in helping seniors overcome these challenges.

To ensure long-term digital inclusion, Slovenia must adopt a holistic approach that combines education, accessibility, cybersecurity awareness, and community-driven initiatives. The following policy recommendations align with the insights shared by Ana Petrič and the

strategies outlined in Appendix 4, offering concrete steps towards bridging the digital gap effectively.

The analysis of mini case studies and best practices highlights several persistent challenges: **lack of confidence** among seniors**, limited follow-up support, rural accessibility issues,** and heavy reliance on **volunteer networks**. While hands-on, needs-based training proves highly effective, many programmes fail due to short-term funding and the absence of sustained mentorship structures.

To ensure meaningful and lasting digital inclusion in Slovenia, a comprehensive strategy is required - **combining structured learning, continuous mentorship, mobile outreach solutions, psychological support mechanisms, operational sustainability, and financial security**. The following proposed solutions integrate successful European approaches while specifically addressing the gaps in accessibility, engagement, and long-term impact identifies throughout this research.

6.2.1 Introduce a tiered digital training model

One of the major challenges in promoting digital inclusion among seniors is the wide variation in their starting points regarding digital skills. Some older adults have never used a smartphone, while others may already possess basic skills but require help with more advanced tasks, such as online banking or accessing government services. A one-size-fits-all approach is therefore ineffective.

A viable solution is to implement a tiered digital training model, structured into three levels: beginner, intermediate, and advanced. The beginner level would focus on fundamental smartphone functions, including adjusting settings, making calls, and sending messages. The intermediate level would cover internet safety, email communication, social media use, and basic online transactions. The advanced group would address more complex tasks such as navigating e-government services, using cloud storage, and participating in video conferencing.

By grouping seniors according to their skill level, training becomes more effective, engaging, and less intimidating. This approach ensures that no one is overwhelmed or left behind, which is crucial for reducing dropout rates and maintaining long-term participation.

6.2.2 Establish a long-term digital mentorship programme

One-time training sessions are insufficient for achieving lasting digital literacy among seniors. Many older adults quickly forget what they have learned or lose confidence when they do not use digital tools regularly. Without sustained support, digital skills fade and engagement declines.

To address this, Slovenia should establish a national digital mentorship programme, where trained volunteers or senior digital mentors provide ongoing, personalised guidance. This programme would consist of three main components: (1) Community tech hubs located in libraries and senior centres, where older adults can drop in for assistance with digital issues. (2) A dedicated helpline for digital support, allowing seniors to seek help whenever they encounter problems or questions. (3) Peer mentoring programmes, where tech-savvy seniors volunteer to assist their peers, fostering community-based learning and confidence-building.

Such an initiative would ensure that learning continues beyond the initial training phase and would empower seniors to use digital tools independently and confidently.

6.2.3 Ensure free or affordable access to digital devices

Many seniors are eager to learn but do not own a smartphone, tablet, or computer. Without regular practice, digital skills are quickly forgotten.

To address this, a device support programme should be introduced to ensure that seniors can access affordable or loaned digital devices. The programme would include (1) tablet lending schemes at libraries and senior centres. (2) Government subsidies or discounts on smartphones and tablets for low-income seniors. (3) Public-private partnerships with telecom companies to provide low-cost data plans tailored to the needs of older adults.

Access to technology is just as important as access to training. Without a device to practise on, even the best digital education programmes will have only limited impact.

6.2.4 Expand digital training to rural areas with mobile units

Rural seniors often miss out on digital training due to transportation issues, weak internet connections, or a lack of local programmes. Many initiatives remain concentrated in urban areas, leaving a significant portion of the population underserved.

To bridge this gap, Slovenia should introduce mobile digital training units - vehicles equipped with internet access, digital devices, and trained instructors that travel to villages and remote communities. These mobile units could offer on-site training at local community centres, libraries, and town halls providing personalised, hands-on learning for small groups. Regular follow up visits should also be scheduled to allow seniors to ask further questions and reinforce their skills over time.

This initiative would ensure that rural communities are not excluded from digital education opportunities and would provide a more equitable level of support across the country.

6.2.5 Address psychological barriers and build digital confidence

Many seniors are hesitant to engage with technologies due to fears of making mistakes or falling victim to online scams. This fear prevents them from fully embracing digital tools, even when training opportunities are available.

To overcome this challenge, digital literacy programmes should focus not only on developing technical skills but also on building digital confidence. Safe, supportive learning environments must be created, where mistakes are seen as a valuable part of the learning process. Using real-life success stories and sharing examples of seniors who have benefited from digital tools can further help to inspire confidence. Additionally, offering gradual learning paths - starting with familiar and low-risk activities such as sending messages or making video calls – would help seniors feel embraced and capable.

By directly addressing psychological resistance, more seniors will feel comfortable, empowered, and motivated to continue learning and engaging with digital technologies.

6.2.6 Secure long-term funding for digital inclusion programmes

A common reason why digital literacy programmes fail is the lack of stable funding. Many initiatives rely on short-term grants, making it difficult to maintain consistent, high-quality training and ongoing support.

Digital literacy should be recognised as a long-term national priority, with dedicated funding and structured support mechanisms. Securing sustained government investments is essential to ensure that programmes remain operational, while partnerships with private companies could provide additional funding, expertise, and resources. Furthermore, local municipalities could be encouraged to finance digital training initiatives within their own communities, ensuring that efforts are tailored to local needs.

By guaranteeing consistent financial support, digital inclusion efforts can be expanded and sustained over time, avoiding the frequent disruptions that undermine progress.

Slovenia must adopt a comprehensive approach to digital inclusion for seniors. This means moving beyond basic training workshops towards the development of a long-term, scalable, and inclusive digital literacy strategy. By introducing tiered training programmes, establishing ongoing mentorship networks, ensuring access to affordable technology, expanding rural outreach, addressing psychological barriers, and securing sustainable funding, Slovenia can empower its seniors not only to gain digital skills but to retain and apply them in their daily lives.

A truly digital society is one in which everyone, regardless of age, background, or location, can participate and benefit. Slovenia has the opportunity to lead by example in creating a more digitally inclusive future for its ageing population.

6.3 Limitations of the research

This research provided valuable insights into digital inclusion programmes for seniors across seven European countries (Slovenia, the United Kingdom, Finland, Sweden, Austria, Estonia, and the Netherlands). However, several limitations must be acknowledged.

One of the principal challenges is comparability. These countries differ significantly in terms of economic strength, population size, and social policies. Wealthier nations, such as Sweden, Finland and the Netherlands, have greater resources to invest in digital inclusion, whereas smaller or less affluent countries, including Slovenia and Estonia, may face greater financial constraints. This disparity makes direct comparisons difficult, as the success of a programme is often influenced by the availability of funding and governmental priorities, rather than solely by the methodology employed.

Infrastructure and accessibility also play a critical role. Countries with well-developed broadband networks and strong digital ecosystems, such as Sweden, Finland and the Netherlands, are better positioned to implement large-scale digital literacy initiatives. In contrast, rural areas in Estonia, and Slovenia continue to struggle with connectivity issues, making it more challenging to replicate successful urban-based programmes. Moreover, geographical distribution impacts delivery: countries with centralised populations can more easily establish training centres, while those with dispersed rural communities face logistical barriers to providing in-person support.

Cultural attitudes towards technology represent another important variable. In countries with a strong tradition of lifelong learning, such as Finland, seniors may be more receptive to digital training. Conversely in other regions, scepticism or resistance towards technology can hinder participation. These psychological and social factors are difficult to quantify and compare across different nations but undoubtedly influence the effectiveness of digital inclusion efforts.

Variability in programme structures presents an additional limitation. Some initiatives, like Sweden's, combine hardware distribution with training, while others, such as the UK's focus purely on mentorship. This variation means that the success of a programme is not determined solely by its training methods, but also by the additional resources available. As a results, best practices identified in one country may not be directly transferable to another without adaptation.

Finally, this research is based on mini case studies, which offer a broad overview of digital inclusion initiatives but may lack depth in certain areas. Some programmes have been evaluated over an extended period, while others are relatively recent, making it difficult to assess long-term success and sustainability. Furthermore, as digital technologies and policies continue to evolve rapidly, strategies that are effective today may not remain so in the future.

Despite these limitations, the findings offer a strong foundation for understanding the key challenges and opportunities in promoting digital inclusion for seniors. Future research would benefit from a more detailed, longitudinal approach, examining how digital literacy programmes develop over time and how they can be adapted to varying socio-economic and infrastructural contexts.

6.4 Implications for further research

This study highlights key findings regarding digital inclusion for seniors, but there remains considerable scope for further exploration. To create truly effective and long-lasting programmes, future research should delve deeper into several important areas.

As essential next step is the long-term tracking of digital literacy programmes. Many initiatives demonstrate promising short-term results; however, it remains unclear how well do seniors retain their skills months or even years after initial training. Do they continue to use digital tools regularly, or do their skills decline over time? Do refresher courses help to sustain engagement? A deeper, longitudinal analysis could answer these questions and inform improvements to programme design.

Another area warranting further investigation is how different countries, particularly those outside Western Europe, address digital inclusion. The seven countries analysed in this study benefit from relatively strong digital infrastructures; however, nations with fewer resources may face different challenges. Expanding research to include Southern and Eastern Europe or a wider range of countries, would provide a broader understanding of which strategies are most effective across diverse socio-economic contexts.

Beyond infrastructure, psychological and social factors play a critical role in seniors' adoption of technology. Fear, lack of confidence, and cultural attitudes toward ageing can all significantly influence participation. Future studies should investigate how best to overcome these emotional barriers—potentially through confidence-building techniques, peer support networks, or storytelling from seniors who have successfully adapted to digital life.

Further research should also explore the most effective methods of delivering digital training. While some seniors prefer in-person classes, others may benefit more from self-paced online learning or hybrid models. Could mobile digital training units bring education directly to rural communities? Could AI-driven assistants offer personalised digital support at home? Investigating alternative learning formats could lead to more accessible and flexible digital training solutions.

Sustainable funding models are another pressing area for future exploration. Many existing programmes rely on short-term grants or volunteer networks, limiting their long-term viability. Research into durable funding solutions – such as government support, public-

private partnerships, and community-driven initiatives – would contribute to the development of more stable and widely accessible digital inclusion efforts.

Finally, future research should move beyond the mere acquisition of digital skills and explore the broader impact of digital inclusion on seniors' quality of life. Does digital literacy reduce loneliness? Improve access to healthcare? Enhance financial independence? As more public services shift online, digital exclusion risks exacerbating social inequalities. Understanding these wider social impacts could provide compelling evidence for prioritising digital literacy as a core policy objective.

By focusing on these areas, future research can help to ensure that digital inclusion efforts are not merely temporary interventions but lasting, impactful solutions that empower seniors to thrive in the digital age.

7 CONCLUSION

In today's world, digital technology is no longer merely an option—it is a necessity. From accessing healthcare and banking to staying connected with loved ones, the ability to navigate the digital space is essential. However, as this thesis demonstrated, not everyone is benefitting equally from the digital revolution. Many older adults in Slovenia remain digitally excluded, facing challenges such as lack of digital skills, fear of technology, financial barriers, and limited access to digital infrastructure. This digital divide not only isolates seniors but also prevents them from accessing services that could significantly enhance their quality of life.

Yet, there is hope. Programmes across Europe have shown that digital inclusion is achievable with the right strategies. Finland's and Austria's initiatives have proven that practical, hands-on training makes a real difference. When seniors experience the direct benefits of technology, they are far more likely to engage with it. Slovenia's own Simbioza programme has demonstrated the power of intergenerational learning, where young people teach seniors digital skills, creating a mutually beneficial relationship between generations. However, as experiences in Sweden and Estonia illustrate, training alone is not enough: seniors require ongoing support, access to devices, and a safe learning environment in which they learn and practice.

One of the most important takeaways from this research is that digital inclusion is not solely about teaching seniors how to use a smartphone or a computer. It is about building confidence, overcoming fear, and making technology feel approachable and relevant. Many seniors do not reject technology because they lack interest; rather, they avoid it because they feel that it is "not for them." When seniors see the real value of digital tools – whether through video calls with grandchildren, managing prescriptions online, or simply reading the news on a tablet – they are far more likely to embrace the digital world.

For Slovenia to bridge this digital gap, several key actions are required. We must move beyond one-time training sessions and invest in continuous digital education, localised support for rural areas, and affordable access to digital devices. Learning from other countries, Slovenia could implement mobile digital literacy units to reach remote communities, expand digital help centres, and foster public-private partnerships to provide subsidised tablets and internet access for seniors. More importantly, we must change the narrative, the way we talk about technology: rather than making seniors feel pressured into adopting unfamiliar tools, we must make them feel included, valued and empowered.

Seeing my own grandparents struggle with technology has made this issue deeply personal to me, and I sincerely hope that this thesis contributes to creating better opportunities for future generations. While younger generations are more digitally skilled, the rapid evolution in artificial intelligence, automation, and digital systems means that continuous learning will be necessary for everyone to keep pace with technological change. The digital divide will not disappear anytime soon; however, with the right approach, we can ensure that no one, regardless of age, is left behind.

Technology should not be a barrier; it should be a bridge – a bridge to independence, connection, and opportunity. If Slovenia takes the right steps, we can build a more inclusive digital society, where everyone can thrive and ensure that no one is left behind. After all, the internet is for everyone, and everyone deserves a chance to be a part of it.

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APPENDICES

Appendix 1: Povzetek (Summary in Slovene language)

V današnjem svetu digitalna tehnologija ni več privilegij, temveč postaja osnovna potreba za dostop do vsakdanjih storitev, kot so zdravstvena oskrba, bančništvo ali preprosto ohranjanje stika z najbližjimi. Kljub temu številni starejši v Sloveniji ostajajo izključeni iz digitalnega sveta. Ta izključenost ni zgolj posledica pomanjkanja znanja, temveč jo poglabljajo tudi strah pred tehnologijo, finančne ovire in omejen dostop do ustrezne infrastrukture.

Magistrska naloga raziskuje, zakaj do te vrzeli prihaja, kako vpliva na vsakdanje življenje starejših in katere ukrepe moramo uvesti, da jo uspešno premostimo. V teoretičnem delu so predstavljeni ključni koncepti digitalne izključenosti, vpliv pandemije COVID-19 ter glavni izzivi, ki starejšim otežujejo aktivno digitalno vključevanje. Empirični del temelji na analizi podatkov iz slovenskih in evropskih virov ter na primerjalni analizi uspešnih praks iz sedmih evropskih držav – Slovenije, Avstrije, Finske, Švedske, Združenega kraljestva, Estonije in Nizozemske. Dodatno težo raziskavi daje poglobljen intervju z Ano Petrič, magistrico socialnega dela in dolgoletno direktorico Centra starejših DEOS Notranje Gorice, ki skozi neposredne izkušnje razkrije realne izzive starejših pri vključevanju v digitalno družbo.

Glavne ugotovitve kažejo, da so za uspešno digitalno vključevanje ključni praktično naravnani programi, dostop do ustreznih naprav, dolgotrajna podpora ter odpravljanje psiholoških ovir. Pomembno vlogo ima tudi medgeneracijsko učenje, saj mlajše generacije lahko pomagajo starejšim premagovati strah pred tehnologijo in graditi samozavest pri uporabi digitalnih orodij.

Na podlagi ugotovitev naloga predlaga konkretne rešitve za Slovenijo: uvedbo večstopenjskih programov usposabljanja, vzpostavitev dolgoročne mentorske mreže, zagotavljanje dostopnih naprav in dostopa do interneta, razširitev programov v ruralna okolja ter zagotovitev stabilnega financiranja digitalnih pobud.

Digitalna vključenost starejših ne sme biti enkratna pobuda, temveč stalna in načrtna skrb družbe. Tehnologija mora služiti kot most, ki povezuje generacije in omogoča sodelovanje, ne pa kot ovira, ki še dodatno izključuje. Vsak posameznik, ne glede na starost, okolje ali socialni položaj, si zasluži priložnost, da postane del digitalne družbe, ki temelji na enakih možnostih za vse.

Appendix 2: Interview questions for Ana Petrič

Introduction and background

Can you tell us a bit about your background and experience working with the elderly, particularly in your role as the director of the DEOS Centre for the Elderly in Notranje Gorice?
Objective: To introduce her expertise and establish her credentials.

What motivated you to work in this field, and what are some of the key lessons you've learned over the years?
Objective: To understand her passion and perspective on elderly care.

Current situation and challenges

From your experience, what are the most common struggles that elderly people face in adapting to the digital world?
Objective: To identify the specific challenges elderly individuals, encounter regarding digital inclusion.

Can you share any surprising insights or observations you've made while working with the elderly on digital skills and technology use?
Objective: To uncover unexpected challenges or areas of resistance that may not be immediately obvious.

How do you see the digital divide impacting the day-to-day lives of the elderly, particularly in terms of their access to services, social interaction, and overall quality of life?
Objective: To understand the broader impact of the digital divide on elderly populations.

Insights on digital literacy and inclusion efforts

What initiatives or programmes have you implemented or observed that have been particularly successful in helping the elderly bridge the digital gap?
Objective: To gather information on effective strategies and programmes.

What barriers have you encountered when trying to engage the elderly in digital literacy programmes, and how have you or others successfully overcome these barriers?
Objective: To learn about the obstacles in promoting digital literacy and the strategies to overcome them.

Are there any specific technologies or digital tools that you find are more easily adopted by the elderly? Why do you think that is the case?
Objective: To discover which digital tools are more user-friendly or appealing to the elderly.

Personal views and recommendations

From your perspective, what are the key factors that contribute to the digital exclusion of the elderly in Slovenia?
Objective: To understand her viewpoint on the root causes of digital exclusion.

What recommendations would you give to policymakers, community organisations, and technology developers to better support the elderly in becoming more digitally inclusive?
Objective: To obtain actionable recommendations for various stakeholders.

How important do you think intergenerational learning (e.g., involving younger family members or volunteers) is in enhancing the digital skills of the elderly? Have you seen any successful examples of this?
Objective: To explore the role of intergenerational support in digital inclusion.

Future directions and opportunities

Looking ahead, what future trends or changes do you foresee in the field of digital inclusion for the elderly? What would be the ideal scenario in the next 5 to 10 years?
Objective: To gain insights into her vision for the future and potential opportunities.

If you had to design a new programme or initiative to enhance digital inclusion among the elderly, what would it look like?
Objective: To encourage creative thinking and practical solutions.

Personal reflections and additional insights

What personal experiences or stories stand out to you when thinking about the elderly's journey toward digital literacy and inclusion?
Objective: To elicit personal stories that provide depth and context to her professional experiences.

Is there anything else you think is important to share about the topic of digital inclusion for the elderly that we haven't covered yet?
Objective: To allow for any additional thoughts or insights that may not have been addressed in the previous questions.

Appendix 3: Recommendations for the Slovenian Government to close the digital divide among seniors

Slovenia faces significant challenges in bridging the digital divide, particularly among its elderly population. By learning from successful international examples and addressing specific local needs, the Slovenian government can take strategic steps to improve digital inclusion for seniors. The following detailed recommendations outline feasible solutions and actionable steps to close the digital gap effectively.

1. Implement comprehensive digital literacy programmes

1.1 Establish community-based digital literacy training centres

Community centres can serve as hubs for digital literacy training tailored specifically to the needs of seniors. These centres should offer regular workshops and one-to-one tutoring sessions focusing on essential digital skills, including the use of smartphones, internet navigation, and access to online services.

Action Steps:

i. Partner with local governments, private companies, and NGOs to identify suitable training locations.
ii. Recruit and train volunteers and staff to deliver digital literacy education.
iii. Develop a curriculum addressing key barriers seniors face, including cybersecurity, government portals, online banking, and communication tools.

1.2 Deploy training units for rural areas

To ensure accessibility in remote locations, mobile training units equipped with digital devices and internet connectivity should be introduced.

Action Steps:

i. Secure funding for purchase and operation of mobile units.
ii. Develop a schedule and route for regular visits to rural communities.
iii. Promote the programme through local media and community leaders to encourage participation.

2. Enhance access to affordable digital devices and internet

2.1 Subsidised digital devices programme

A government-backed initiative to provide affordable or subsidised digital devices (e.g., tablets, smartphones, laptops) can significantly improve digital access for seniors. Devices should be pre-loaded with user-friendly applications and educational resources.

Action Steps:

i. Collaborate with tech companies to negotiate discounts on bulk device purchases.
ii. Establish criteria to ensure devices reach those most in need.
iii. Provide training and support for device setup and use, accompanied by a dedicated customer support helpline.

3. Promote intergenerational learning and support

3.1 Intergenerational mentorship programmes

Pairing tech-savvy youth with seniors fosters mutual learning and strengthens community bonds.

Action Steps:

i. Launch a national campaign to recruit volunteers from schools, universities, and youth organisations (expanding on the Simbioza model).
ii. Develop a framework for matching mentors with seniors based on needs and preferences.
iii. Train mentors to teach digital skills effectively and respectfully, using high-quality materials.

3.2 Family-based digital education initiatives

Encouraging families to engage in digital learning together can enhance seniors' confidence and skills.

Action Steps:

i. Create and distribute educational materials and online resources aimed at family-based learning.
ii. Organise family-oriented digital literacy events and workshops.
iii. Share success stories via media campaigns and social media to inspire broader participation.

4. Develop user-friendly digital platforms and services

4.1 Simplified digital interfaces

Government and private sector digital services should be designed with seniors in mind, featuring simplified, accessible and easy-to-navigate interfaces.

Action Steps:

i. Conduct user research to understand seniors' specific needs and preferences.

ii. Collaborate with UX/UI designers to create senior-friendly digital platforms.
iii. Regularly update and test platforms to maintain accessibility and usability.

4.2 Dedicated support channels

Establish dedicated customer support services to assist seniors in navigating digital services.

Action Steps:

i. Create a helpline specifically for digital assistance.
ii. Train support staff to address common challenges faced by seniors.
iii. Promote support channels through senior centres, healthcare providers, and community organisations.

5. Increase awareness and outreach

5.1 National awareness campaigns

Launch national wide campaigns to raise awareness of digital literacy opportunities and available resources for seniors.

Action Steps:

i. Develop a marketing strategy featuring testimonials from digitally literate seniors.
ii. Collaborate with media outlets and senior-focused influencers to expand reach.
iii. Monitor and evaluate campaign impact to refine strategies as needed.

5.2 Partnerships with healthcare providers

Healthcare providers are uniquely positioned to promote digital literacy among seniors.

Action Steps:

i. Integrate digital literacy education into routine healthcare visits and wellness programmes.
ii. Train healthcare providers to identify digital literacy needs and refer seniors to appropriate resources.
iii. Distribute targeted educational materials through hospitals, and pharmacies, supporting the adoption of healthcare apps and e-services.

6. Leverage international best practices

6.1 Adopt successful models from other countries

Learning from best practices abroad can help Slovenia develop more effective digital inclusion strategies.

Action Steps:

i. Organise study visits and exchanges with countries that have implemented successful digital inclusion initiatives.
ii. Pilot adapted versions of these models in different Slovenian regions.
iii. Scale up successful pilots into national programmes tailored to local needs.

6.2 Continuous monitoring and evaluation

Establish a robust monitoring and evaluation framework to measure the effectiveness of digital inclusion initiatives.

Action Steps:

i. Develop key performance indicators (KPIs) to track progress.
ii. Conduct periodic surveys and focus groups with seniors to gather qualitative feedback.
iii. Publish annual reports on digital inclusion progress, using findings to refine and update strategies.

By implementing these recommendations, the Slovenian government can create a more inclusive digital society, ensuring that seniors are not left behind in the digital age. A comprehensive, community-driven, and sustainable approach will empower Slovenia's older population to navigate and benefit from the digital world with confidence and independence.