Enhancing Digital and Soft Skills for Ageing Workforce
EDSAW
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Adapting to the Future: A Needs Analysis for Enhancing Digital and Soft Skills Among Older Workers

Report

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Table of Contents

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Foreword

The EDSAW Needs Analysis Report provides an overview of the needs analysis for digital and soft skills of economically active people above 50 years of age in the member countries of the EDSAW consortium, i.e., Slovakia, the Czech Republic, Spain, and Türkiye. This report focuses on particular major challenges and gaps that older workers face in the workplace, and it explores ways that could help them to learn essential skills required by the modern workforce.

With the labour market increasingly reliant on such skills as digital literacy and interpersonal skills, the current levels of these skills amongst older workers need to be carefully ascertained, and the measures to be taken to bridge any shortcomings. The results of this analysis will be reflected in the established E-learning platform that will provide free access to courses focused on building up digital and soft skills of people 50+ based on the needs identified for older workers. The courses will cover areas from basic proficiency in digital skills to cybersecurity and new technologies and soft competences such as communication, leadership, teamwork, or presentation skills. They will not be available only in English, but also in Slovak and Czech languages to mitigate possible language barrier in the access of Slovak and Czech population, on which the EDSAW project focuses, to developing their digital and soft skills. The goal of the EDSAW project is to make competencies of older workers aligned with the needs of current businesses so as they were able to manage the pressure on efficiency that they encounter in their work environment.

Readers can follow the EDSAW project on the project website (www.edsaw.eu) or enrol in the developed courses on the developed E-learning platform at www.everlearning.io. The authors will be grateful for any comments or suggestions, which will improve our work and enhance the positive impact that we aim to have on economically active people aged 50+.

Anetta Čaplánová

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1. The Importance of Life-Long Learning with Special Focus on Older Workers

1.1 Context and Background

In the past few decades, the nature of jobs has seen drastic changes with the gradual transition from long-term stable careers under one employer to a fluid dynamic, and at times unpredictable job market. Typically, most workers held onto job security by working for the same organization throughout their entire careers. It ensured a clear and linear career track where one could amass experience steadily and make their way up within the company. Drastically switching from economies based on production and manual labor, to those based on knowledge where value is created through intellectual capital and innovation, has tremendously revolutionized employment opportunities. This shift has been powered by rapid technological growth plus digital technologies' emergence along with global markets' integration that have played a role in completely transforming what workers need to remain competitive in the labor force. In recent years, technological development based on automation, artificial intelligence (AI), and information technology (IT) resulted in reduced demand for routine and manual tasks and increased demand for cognitive, creative, and problem-solving skills as well (Schwab, 2016).

Machines and algorithms can do many tasks that previously were done by humans—for example, in manufacturing or data entry and clerical office work. More and more jobs require critical thinking, adaptability and the capacity to lead — taking advantage of new technologies. Employees need to be digitally literate and have the ability to engage with technology (Brynjolfsson & McAfee, 2014). Globalization has also been instrumental in fostering this trend. With markets open globally where capital goods along with labour can move across borders this has led to the increase of competitive pressure within industries. Companies now seek talent from around the world, often prioritize the most skilled and adaptable workers regardless of their location. This has led to increased flexibility of labour markets and it places pressure on workers to make transitions between jobs, industries, and in some cases countries before they can find job opportunities (Autor, 2019).

The past concept of having "a job for life" is now obsolete as workers are much more likely to have multiple job changes in their careers. Thus, adaptability becomes one of the most valuable assets for workers. The ability to learn new skills and respond to technological disruptions is what makes an individual employable. This implies that lifelong learning has become necessary for workers who need to remain relevant on a labour market which is steadily evolving, where employees are supposed to update their skills regularly (mostly through reskilling or upskilling initiatives) so as to meet changing demands from employers/industries. The move from industrial to knowledge-based economies has highlighted the increasing relevance of two key skill sets: digital skills and soft skills. Workers are expected to have and apply their digital skills, in particular, data analysis, programming and the capacity to work with and manage digital resources, in their daily activities (Brynjolfsson & McAfee, 2014). Employees who are able to use technology to enhance their productivity, creativity and effectiveness, are highly sought after in every sector of the economy.

At the same time, hard skills such as the ability to program and code, analyse data mathematically, and use AI and machine learning are rising in importance. In a modern work environment where emerging technologies are increasingly used, technical skills have taken up most of the requirements, however, some basic understanding of these kinds of technologies is also required from potential job candidates. Companies are looking for employees who can work well in cross-functional teams and are also be able to lead them, handle complex

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relationships, and manage conflicts in an effective as well as productive way (Deming, 2017). These soft skills are often considered a differentiating factor between workers in a competitive job market.

For older workers particularly those over the age of 50, these changes bring both challenges and opportunities. Many older workers have found themselves at risk of becoming obsolete in a rapidly evolving labour market where the need to reskill or upskill has become critical especially for those workers who did not grow up with the digital technologies (Schwab, 2016). Reskilling is not just the acquisition of new technical skills, but it is also the development of adaptability plus flexibility and the mindset of lifelong learning which is needed to be able to flourish within the job market. The training of old workers should be seen not only as a technical requirement but as a holistic process that requires, in addition to technical skills, also the ability to work with people.

1.2. The Challenges Faced by Older Workers (Aged 50+)

Older workers face challenges that are unique given the rapid evolution of the job market, which is also rooted in social perceptions and systemic biases that make their situation even worse. It is these age-related barriers, coupled with the undervaluation of their experience and technological change taking place at a fast pace, that have placed older workers at a disadvantage despite the wealth of knowledge and skills that they possess. One of these pressing issues for older workers is the age discrimination. Although there exists legislation in many countries that prohibits bias against someone based on their age, older individuals often find it hard to get hired for jobs because people have certain perceptions about them and their abilities. Management might consider them less adaptable or open to change, or view them as more expensive in terms of their salary expectations when compared to what younger employees would be paid. This age-related bias can be a barrier already laid before the capabilities are assessed of an older worker, leaving them often on the side-lines within a job market (Ng & Feldman, 2012). This bias is compounded by the tendency of hiring processes in innovation and tech-driven sectors to favour younger candidates, better aligned with new trends and tools. (Swift et al., 2017). Although older workers may have abundant experience, this experience can be at times what considers them as underqualified. Employers might observe in older workers skills that are too specific and fitting for previous periods, which makes it difficult for these workers to effectively market themselves (Cappelli & Novelli,2010). However, it should be remembered that these skills are in high demand in roles requiring mentorship or strategic oversight (Coughlin, 2018). The barrier that results in the disconnect between older worker experience and what contemporary employers demand is essential to their employment.

Another major obstacle for older workers is the rapid pace at which technology progresses. Many older people developed their careers in industries or roles where required skill sets changed over time quite substantially. For instance, such sectors like manufacturing, finance, and healthcare witnessed large-scale adoption of digital tools as well as data analytics and automation. Workers who have not continually updated their skillset may find themselves at a disadvantage because more recently employers look for candidates who would be able to use these new technologies efficiently (Frey & Osborne, 2017). Older workers have been also unequally affected by the digital divide, since a significant number of them joined the workforce before computers and the internet became widely used. On the other hand, younger generations have grown up in a digital world and they have integrated new technologies into their daily lives. This makes the older workers more likely to struggle to adapt to these changes, especially

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if they have not had access to upskilling opportunities. The result is a mismatch between their skills and the skills that modern jobs require (McQuaid et al., 2019).

Unemployment or underemployment among older workers have significant economic and social consequences for these individuals and for society as a whole. As for individuals, prolonged unemployment can lead to financial instability, especially for those close to retirement, who have not accumulated sufficient savings or pension benefits. This can force them into seeking employment on an age-discriminatory market and delay their retirement (Roscigno et al., 2007). Additionally, underemployment is a situation in which individuals are forced to accept jobs below their skill level or pay grade which also does have a detrimental effect on the economic well-being and self-esteem of older workers. Many of these older workers are looking for full-time stable employment but find it challenging and so they take-up part-time or temporary work that does not fully utilize their skills, or it is an inadequately paying job. This can result in feelings of frustration for these workers, making them feel underappreciated and underused despite their extensive experience.

From a wider perspective, the unemployment or underemployment of older workers represents a loss of human capital. Often, their knowledge and expertise are lost when they leave the workforce prematurely or when they are forced to work in jobs that are beneath their level of experience (Salthouse, 2019). Socially, the fact that older workers are unemployed may lead to their isolation: it may also provoke the me and physical health decline. Work provides a sense of purpose structure and social interactions; the loss of employment affects the overall well-being of a person. In societies where the identity and self-worth are often tied to professional success, older workers who are pushed out from the workforce might find themselves with reduced life satisfaction (Lahey, 2010).

1.3.Importance of Soft Skills and Digital Skills in the Modern Workforce

As technology continues to reshape industries and the global economy, the ability to navigate digital tools and platforms is essential. Also, skills like communication, teamwork, and adaptability are increasingly valued, especially as businesses seek to foster collaboration and drive innovation. The widespread integration of digital technologies across industries has made digital literacy a requirement for workers. Regardless of the sector, digital tools have become part of everyday work. The adoption of automation, artificial intelligence (AI), and data analytics has shifted the emphasis from manual, repetitive tasks to more complex roles that require cognitive skills. Employees need to have a basic understanding of digital platforms and tools such as cloud computing, data management, and cybersecurity (World Economic Forum, 2023).

Moreover, the rise of remote work, which accelerated during the COVID-19 pandemic, has further enhanced the need for digital skills as a basic competence. Workers must be proficient in virtual communication tools like Zoom, Slack, and Microsoft Teams, which enable them to collaborate across time zones and geographic areas. The digital skills are essential for maintaining productivity but also for fostering innovation and problem-solving in an increasingly virtual work environment (McKinsey, 2021).

Soft skills have become equally valuable in the modern workplace. In an era of automation, the human skills that machines cannot replicate such as emotional intelligence, adaptability, creativity, and problem-solving, are becoming central. According to a 2023 report by the World Economic Forum, companies increasingly prioritize soft skills in their upskilling and reskilling initiatives, which points out that they recognize their critical role for navigating complex challenges and fostering innovation (World Economic Forum, 2023).

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Effective communication is necessary for successful collaboration, particularly in diverse and virtual teams. Workers who can express their ideas clearly, listen actively, and convey empathy are better positioned to build trust and foster a positive work environment (Skillfloor, 2023).

Adaptability represents another key soft skill that has become crucial in a rapidly changing work environment. Those workers who can quickly adjust to new tools, strategies, or market conditions are more likely to be successful. During the pandemic, businesses that could switch swiftly to digital platforms and remote work environments often saw better outcomes. This trend continues today, where change is constant, and the ability to embrace it is essential for career longevity and success (Morphoses, 2024).

Problem-solving and creativity are also increasingly valued as industries seek to innovate and differentiate themselves in competitive markets. Employees who can approach challenges with a critical and creative mindset are essential for driving organizational growth and adapting to the evolving demands of customers and markets (Skillfloor, 2023).

Recent studies and reports emphasize the growing need for both digital and soft skills. For instance, a 2023 report by the World Economic Forum highlights that nearly 50% of all employees will need reskilling by 2025 due to increased digitalization. Analytical thinking, problem-solving, and AI-related competencies are at the top of the list of skills required for the future. However, also interpersonal and leadership skills are increasingly prioritized by businesses (World Economic Forum, 2023). Companies that foster a culture of lifelong learning and encourage digital upskilling and the development of soft skills are better equipped to adapt to changing market conditions. The most successful professionals will be those who continuously refine their technical skills and also cultivate soft skills that enable them to work effectively in teams, lead others, and drive innovation (Morphoses, 2024).

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2. Defining Reskilling for the 50+ Demographic

2.1. The Concept of Reskilling

Reskilling refers to the process which aims to equip individuals with new skills that are relevant to the current and future labour market conditions, esp. when their existing skills have become outdated. The 50+ demographic group requires reskilling, since they face challenges associated with the rapid advancement of technology, shifts in job markets, and later retirement. In many cases, these individuals must shift their careers to entirely new sectors or roles that require skills that they may not have acquired earlier in their careers. Therefore, reskilling is necessary for them to embrace lifelong learning, stay competitive and adapt to the evolving demands of the modern workforce.

Reskilling is distinct from upskilling when the latter typically refers to building upon existing skills to perform more complex tasks within the same field. It allows workers to advance in their current roles, since it enhances their proficiency in new tools or techniques. For instance, a marketing professional may be upskilled by learning advanced data analytics, which then improves their ability to interpret and use data for developing marketing strategies. Reskilling involves acquiring entirely new skills that allow individuals to transition into different jobs, or career paths. This is often necessary when whole industries are disrupted by technological advancements or shifts in demand.

Reskilling is not a one-size-fits-all process, it often needs to be tailored to specific needs of industries and the workers involved. Reskilling is essential not only for individual workers, but also for the economy as a whole. As populations age, countries need to focus on sustaining the participation of older workers. Also, the ability to adapt and perform in new job roles can significantly increase job satisfaction, financial stability, and overall well-being among older workers and allow them to extend their careers and contribute meaningfully to the economy.

2.2. Specific Arguments for Reskilling Older Workers

In automation, digitalization, and the rise of artificial intelligence in many economies, older workers are more at risk of being displaced. Resolving this problem is not only an economically efficient but also ethically legitimate task to enable every worker to requalify in the conditions of the rapidly changing modern world. At the same time, older employees bring accumulated wisdom, problem-solving skills, and leadership qualities which are very often irreplaceable within organizations. This experience allows older employees to mentor the younger generation, drive strategic decision-making, and provide stability during periods of organizational transition. Research has indicated that mature workers excel on job roles, where judgment and complex decision-making is required based on the ability to anticipate challenges from past experience (Coughlin, 2018). While younger workers might be more acquainted with cutting-edge tools, they frequently do not have deep subject matter knowledge as their elder peers. Thus, on the one hand, older workers have valuable experience. However, if they are not very literate in digital technologies, this may prevent them from fully participating in the workforce.

A focus on reskilling programs that integrate experience with new competences can ensure that older workers remain an essential part of the workforce. Age discrimination is a problem that looms large in the workplace, especially in those sectors going all-in-one for digitalization at a rapid pace. In many cases, older workers are seen as less capable of learning new skills or less flexible with change or even less productive than their younger counterparts.

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Furthermore, age discrimination becomes more pronounced as workers reach the retirement age and this affects their job opportunities on the labour market situation (Roscigno et al., 2007).

The ethical aspects related to this issue are quite significant because it touches upon sensitive topics. The principle of fairness and equality in the workplace means that everyone should have equal access to training and development, regardless of their age. Initiatives aimed at reskilling older workers may help to correct these imbalances. Reskilling is a powerful instrument to eliminate age bias in the workforce. By investing in programs that enable older employees to acquire new skills, particularly in digital and technical areas, organizations can address preconceptions surrounding ageism. Reskilling programs that are practical and ensure that learning is easy for older workers help them bridge technology which enhances their employability and also opens doors for new opportunities.

The reskilling of older workers has clear economic and social justifications. The global population is aging, and many countries will see a major increase in the share of older workers in their labor force. By 2050, it is estimated that the number of people aged 60 years and over will more than double and reach 2.1 billion globally (World Health Organization, 2021). This demographic shift will have profound implications for labour markets and also affect pension and healthcare systems. For economies to be productive and sustainable after this type of shock they need to keep older workers involved in the workforce. Reskilling programs can ensure that such workers have competencies that they need to stay competitive while also reducing the financial burden on social welfare systems and boosting overall economic productivity. Older adults who continue to be in employment are more likely to report higher levels of life satisfaction and better mental well-being. (Lahey, 2010).

2.3. Global Examples: Trends and Case Studies in Reskilling Older Workers

Reskilling older workers has come to the forefront of the attention of many governments, industries, and companies. With the aging global workforce and technological advancement, there is an increasing number of initiatives taking place to help older workers to remain competitive in the labour market. These programs have been initiated both by the public and private sectors and can be a good example of how countries or businesses can successfully address challenges related to aging workforces.

Several governments have implemented national policies to help reskill their older workers. One of what is considered a successful example is Singapore's SkillsFuture initiative that extended the learning of a lifetime and workforce development for people of all ages including those above 50 years old. The program provides subsidies and credits to individuals which they can use to enroll in training programs building up the skills for emerging industries (or industries facing major overhaul) such as digital skills and competencies, financial sector or healthcare sector. The program has had high participation rates from older workers and has been considered to contribute to the decrease of risks in this demographic group; it is also considered as an important factor contributing to higher job satisfaction and employability among older workers (https://www.skillsfuture.gov.sg).

In Germany, several programs have been launched by the government to address skills gap of older workers such as "WeGebAU" (Weiterbildung Geringqualifizierter und beschäftigter älterer Arbeitnehmer in Unternehmen) which is a reskilling initiative specifically targeted at older workers. This scheme subsidizes firms to train older workers so that they can continue to work in industries that are heavily technologically disrupted. The program resulted in increased numbers of older workers being reskilled and allowed a large share of them to make transitions to higher-skilled jobs in such areas as IT or green energy.

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The private sector can also play an important role in reskilling older workers. Many companies recognize the value of retaining their experienced employees. One such company is AT&T, one of the largest telecommunications companies in the United States. It implemented the "Future Ready" program and focused on reskilling and upskilling of its workforce, including older workers. The program gives employees access to online learning platforms like Coursera and it focuses on various skills related to data science, network engineering, cybersecurity and others. AT&T employees are also encouraged to enroll themselves in digital transformation courses, with costs covered by the company as well. One of the goals of the program has been a decrease in employee turnover. The turnover decreased by about 30% for employees over 50 years of age, which documents its effectiveness also for this age group (https://www.aspeninstitute.org/of-interest/upskilling-news-att-invests-1-billion-employee-reskilling).

There are also public-private partnerships used to reskill older workers. In Finland, this is the National Skills Program (https://okm.fi/etusivu), where the initiatives are undertaken through collaboration between government, employers, and educational institutions so that workers of all ages have access to relevant skill training. One part of this program is "Fit for Digital Work" (https://oecd.ai/en/dashboards/policy-initiatives/http:%2F%2Faipo.oecd.org%2F2021-data-policyInitiatives-26378), which offers training vouchers funded by government for older workers to take up courses provided by private technological firms and universities in which SMEs are also in focus. Successful reskilling initiatives indicate the critical role that government and private sectors play in helping older workers to adapt to changing job markets. Governments often subsidize the training, private companies or public institutions are used to offer targeted retraining and upskilling. As the workforce ages further and technological progress accelerates, such training programs will further increase in their importance.

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3. The Use of Online Learning Platforms for Upskilling and Reskilling Older Workers

In the last few years, online learning platforms have reinvented the way in which an individual can get access to education and training. It's not just about classroom-based teaching anymore; learners can now upskill themselves, learn and even get certified right from the comfort of their homes or workplace. This transition was triggered by technological advancement, for example, widespread availability of high-speed internet and the birth of online learning platforms and intuitive educational software.

These changes have not only provided greater flexibility in education but also democratized it. Coursera, edX, LinkedIn Learning or Udemy represent some popular platforms that offer a variety of courses ranging from programming to data science, leadership and other soft skills. Very often these platforms cooperate with universities as well as industry experts and companies to create content that is relevant and affordable for a learner. The popularity of MOOCs and micro-credential programs has further increased the visibility of education and allow individuals to acquire skills that are in high demand without the costs which are tied to traditional degree programs.

Online learning platforms prove to be very effective tools for upskilling and reskilling of individuals, and they represent an essential tool for those who would like to succeed on the labor market including older employees. Unlike younger demographic groups, they may have more challenges using e-learning technologies. However, existing online learning platforms and courses offered are developed in English, or other major languages which puts at disadvantage people without knowledge of any of these languages. Thus, even though online learning platforms provide flexible, self-paced courses that cater to a variety of skill levels, they are not accessible to people who do not have language skills needed to follow them in any of these languages. Then, there is the need to develop courses in national languages which would be accessible for them.

The subsidies provided from different sources can help to overcome existing scarcity of online training courses even in small countries where their national language is spoken by only a few millions people. If there is a wide range of courses available on online learning platforms in the language they understand and can work in, older workers can choose from among them. Also, if they needed to pick up basic digital skills such as to work with Microsoft Office or to steer through cloud platforms, or more advanced skills like project management or data analysis, they could choose learning opportunities that would be suitable for their level of expertise.

In addition to technical skills, many platforms pay attention to soft skill development that is very important for older employees. Such skills as communication, leadership, and teamwork are especially valuable in case they take on mentoring roles or managerial positions. The award of certificates for the courses passed makes it possible to put the achievement in their resumes and increase their chances in the labour market. They can also serve as a signal for employers of an attitude toward continuous self-education.

However, alongside language competence, other challenges are still present for older workers in terms of using online learning platforms. The lack of digital literacy can act as a barrier of their active engagement with such resources. Also, motivation and confidence may be inhibiting factors since some older workers might feel intimidated by the single idea of going back to the educational setting again. Therefore, the courses must be designed with the needs of older learners in mind and the online platforms must be adjusted specifically for them.

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3.1. Benefits of Online Learning Platforms for Older Workers

The following account outlines factors making the provision of online learning timely for an older demographic.

- **Flexibility and Accessibility**

In traditional classrooms, learners must adhere to a fixed schedule, on the other hand, online platforms allow learners to learn at their own pace. This is crucial for older workers who may have other responsibilities and might not be able to learn full-time during the week. Self-paced learning enables them to adjust their studies to fit their working hours. Moreover, online learning means that there is no need to travel or relocate; this is particularly beneficial if mobility is an issue for older workers or if they live in areas, where access to education is limited. Older individuals can study in high-quality courses from prestigious educational institutions at home and never have to leave home. This can be very important, especially for those, who are in rural areas, where training centers are not available. Also, the OECD research (2021) revealed that older workers would prefer the learning methods that enable them to maintain their work-life balance.

- **Customization and Tailored Learning Paths**

Another notable advantage of online learning platforms is the possibility of customization of the learning path. Be it skill gaps for older workers or the necessity to build some basic digital literacy, custom tailored learning paths can be a solution. Advanced algorithms (and artificial intelligence) are used by online learning platforms like Coursera or Udemy to evaluate the current level of skills that a learner has and make recommendations on courses suitable for a specific individual. This way, older workers will not find themselves going through content that might either be too advanced or entirely basic in relation to their capacity and needs. Many online platforms also offer micro-credential programs and shorter courses which enable older learners to take up new skills in small chunks and give them the flexibility to build up knowledge over time. The Cedefop study also reported that personalized learning paths are likely to be more effective for older workers in case of entirely new domains (Cedefop, 2018).

- **Cost-Effectiveness**

The factor of cost weighs significantly for those who may face financial constraints. Perhaps the most attractive side of online educational platforms is their low cost compared to traditional in-person education or vocational training programs. Many massive open online courses (MOOCs) on platforms like edX, FutureLearn, and LinkedIn Learning offer free or very low-cost courses on a wide variety of subjects including digital literacy, management skills and emerging technologies. Moreover, many companies and governments often subsidize training programs which they run in collaboration with these platforms, which further reduces the costs for older workers. For instance, the SkillsFuture initiative in Singapore gives citizens credits which can be used to pay for courses on various online learning platforms. Therefore, the affordability of online learning courses reopens workers the opportunity to continuously update their skills by taking on new relevant training, the cost of which does not have to come out of pocket of an individual and create an added financial burden.

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- **Building Confidence**

As mentioned above, many older workers can find it intimidating to return to a learning environment after years in the workforce, especially if they are unfamiliar with the latest technologies. In this situation, online learning platforms provide them a structured and supportive environment that can help mitigate their anxiety and stress. Many platforms also incorporate online communities, forums, and peer support systems that allow learners to interact with fellow students, share their experiences, and be reassured. These communities are also considered to reduce the stigma of being "left behind" by younger colleagues with better knowledge of technology. These spaces also provide opportunities to ask questions and receive guidance without the pressure of real-time classroom interactions.

Moreover, they provide structured learning paths that allow older workers to build confidence. Such platforms as Khan Academy and Udemy allow to build skills and knowledge from the very beginning and move later to more complex concepts. As found in a study by AARP (2020), structured, accessible learning platforms can dramatically improve the self-esteem of older learners, leading to greater engagement and a higher likelihood of course completion. It can be expected that as more industries adopt digital tools and technologies, online learning will continue to play a crucial role in the system of life-long learning.

3.2. Online Learning Platforms for Upskilling and Reskilling Older Workers

3.2.1. General Learning Platforms

Coursera, Udemy, and edX stand out as three of the most popular online platforms that offer a wide variety of courses, from digital literacy as technical skills to soft skills (including project management skills or leadership abilities). Coursera forges collaborative partnership with universities and industry leaders by providing courses at an introductory through advanced levels. Learners can also obtain certificates from prestigious institutions which can help boost resumes and work profiles. The Professional Certificates at Coursera help learners to earn credentials relevant to their career that are recognized by various industries.

Udemy is also known for its affordability and having a more varied selection of courses tailored specifically towards practical, real-world applications. Courses on Udemy are much shorter and more focused which might work for employees looking forward to learning any specific skill over a short term without unnecessarily diving deep into academic research.

EdX provides university-level courses from elite institutions such as Harvard, MIT, and Berkeley. Many of the courses are free to try out, which helps one explore various topics as wide as one's desire without paying. EdX also provides MicroMasters programs, which might be useful if someone is thinking about transition into new areas. These programs usually combine the theoretical and practical aspects, and this can make them attractive for older people. Although they do offer courses in other languages, the range of such courses is not very broad.

LinkedIn Learning is primarily centered on professional development and technical skills, so it represents a valuable resource for older workers who wish to increase their expertise and expand their professional network. LinkedIn Learning offers a broad selection of courses focused on acquiring technical and soft skills: these are most valuable for workers making transition into leadership or freelance roles, where self-promotion is key to success.

Skillshare is able to attract people who are willing to consider new careers or hobbies and be engaged in creativity and entrepreneurship. They offer creativeness and soft skill support provided by such courses as graphical design, photography, or creative writing. These are

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suitable for older people interested in starting a business or freelance career. It involves a community-based approach to learning where learners collaborate with each other and create an atmosphere of peer support.

In both Slovak and Czech languages, there is an online platform called SkillMea (www.skillmea.sk) that offers courses for building digital skills and soft skills but does not specifically focus on the older workforce in terms of addressing their unique needs. Seduo is another platform that is available on both the Slovak and Czech markets (www.seduo.sk).

3.2.2. Specialized Platforms for Older Workers

Beside mainstream platforms like Coursera and LinkedIn Learning, there are also online learning platforms that are specifically designed for older workers. These platforms offer courses that reflect unique challenges and opportunities that this demographic group faces. The next two examples are from the US and represent platforms which focus on older people.

Senior Planet (www.seniorplanet.org), provides onsite courses in the US as well online courses on digital literacy, well-being, healthy lifestyle and others to help older people to navigate the online world, where it is possible to develop their interests and related skills. The platform also holds workshops and virtual events promoting lifelong learning and community engagement.

AARP Skills Builder for Work (www.aarp.org/work/skills-builder) focuses on providing older workers with the skills that they need to remain competitive in the job market. They offer online courses concerning topics such as job search strategies, entrepreneurship, and digital tools. These programs also help in dealing with the specific challenges that older workers might come across, e.g, breaking through age-related biases in hiring and adapting to a workspace that is more digital.

3.3. Specific Features of Online Educational Platforms for Older Workers in Slovakia and Czechia

The population of Slovakia and the Czech Republic experiences ageing and there is an increasing demand for accessible online educational platforms reflecting the needs of older population. At the same time, both countries undergo rapid digital transformation, and many older workers find themselves in need of upskilling and reskilling. The following factors can be considered key regarding the needs for online learning resources for older adults in these countries:

1. Language Accessibility

One of the key needs for older workers in Slovakia and the Czech Republic is access to online learning platforms in their native languages since the language barrier represents a significant challenge for older adults, who may not be proficient in English. Thus, there is a growing need for platforms that provide courses and user interfaces in Slovak and Czech languages. This would make learning more accessible, and it can be expected that it would also foster larger engagement of learners, as they would feel more comfortable interacting with the content.

2. Tailored Content for Older Workers

Online learning platforms for older workers in Slovakia and the Czech Republic must focus on content that is both relevant and tailored to the unique needs of this demographic group. These courses should put priority on digital literacy, since many older workers in the region may lack basic digital skills. Also, many older workers have abundant experience and are promoted to

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leadership positions. Thus, the development of their leadership and communication skills in increasingly digital workplaces is also needed. Such courses as developing emotional intelligence, time management, or team collaboration tailored to older learners can help them to be successful in their managerial and leadership roles. In Slovak and Czech economy, the manufacturing, automotive, and service sectors have been undergoing significant changes due to automation and digitalization. Tailored programs focusing on reskilling older workers in these sectors are needed, which would reflect on modern technologies like AI and automation, are needed for addressing the changing needs of the job market.

3. User-Friendly Interface and Support

Older workers often face technological challenges with using the online platforms, especially if the interface is more complex or if they lack support. Platforms focused on older demographic groups of the population must utilize user-friendly design that reflects different levels of digital literacy. Key features should focus on simplified navigation with clear and easy-to-understand menus and instructions also in local languages. *A*ccessibility features such as larger fonts, adjustable screen settings, or audio support for learners with vision or hearing impairments are also important. Older people might also need more often *technical support* in local languages.

4. Flexible Learning Models

As specified above, older workers in Slovakia and the Czech Republic can be also expected to have specific learning needs, such as a preference for self-paced and flexible learning or a need for additional time to complete assignments. Thus, learning platforms focused on older workers should provide flexible options for course completion, include longer access to course materials and allow learners to progress at their own speed. Also, blended learning approaches, which would combine online and in-person learning, or mentorship could further enhance the learning experience of older workers.

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4. Needs analysis country report: Slovak Republic

4.1.Methodology

To achieve the goals of the EDSAW project, the Needs analysis is the crucial and starting point for developing courses for ageing workforce addressing the specific needs of this labour group. The goal is to support and enhance their digital knowledge and skills, thereby improving digital competencies and enabling them to compete with other workforce groups, such as younger, more digitally skilled and knowledgeable workers.

The necessity of educating the ageing workforce is underscored by the fact that individuals aged 55 and over constitute 18.70% of the total active population in the Slovak Republic as of the second quarter of 2024. This proportion is even higher in certain Slovak regions (see the Table 4.1).

Table 4.1: Active population in age of 55+ and total (2024 – Q2)

Region / active population	**Active population 55+ (thousands)**	**Active population - total (thousands)**	**Active population 55+ (% of total active population)**
Bratislava region	83,4	405,6	20.56
Trnava region	53,1	290,3	18.29
Trenčín region	56,7	285,0	19.89
Nitra region	68,2	342,1	19.94
Žilina region	60,5	354,7	17.06
Banská Bystrica region	63,4	311,7	20.34
Košice region	59,7	373,5	15.98
Prešov region	71,0	397,5	17.86
Slovak republic	516,1	2760,4	18.70

Source: DATAcube

The survey was conducted in Slovakia with a sample of 150 respondents aged 50 to 65 during the period of 24.6.2024 – 26.6.2024. It was carried out by an external company specializing in surveys, MN Force. Stratified random sampling was used to gather responses from the ageing working population.

Table 4.2 presents the development and the share of active population of age 55+ and the total active population. It is clear that the share of active population in age above 55 is increasing and in 2nd quartal of 2024 represented 18.70% of total active population, while it was only 7.33% in 2005.

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Table 4.2: Development of active population in Slovakia (2005 – 2024_Q2)

Year	Active population 55+ (thousands)	Active population - total (thousands)	Active population 55+ (% of total active population)
2005	194,0	2645,7	7,33%
2006	213,4	2654,8	8,04%
2007	229,8	2694,2	8,53%
2008	262,2	2691,2	9,74%
2009	281,1	2690,0	10,45%
2010	307,2	2706,5	11,35%
2011	328,4	2680,0	12,25%
2012	357,0	2706,5	13,19%
2013	370,7	2715,3	13,65%
2014	381,8	2721,8	14,03%
2015	401,3	2738,3	14,66%
2016	417,8	2758,1	15,15%
2017	442,3	2754,7	16,06%
2018	449,0	2746,3	16,35%
2019	471,3	2741,4	17,19%
2020	480,6	2712,7	17,72%
2021	490,2	2748,2	17,84%
2022	511,3	2774,3	18,43%
2023	524,7	2771,9	18,93%
2024_Q1	512,7	2755,9	18,60%
2024_Q2	516,1	2760,4	18,70%

Source: DATAcube

The results of calculating the sufficiency of the sample of 150 respondents out of the number of active population of 516,100 workers in 2nd quartal of 2024 in age of 55+ are presented in the Table 3. By the given sample of the survey, the margin of error is 8% at a 95% confidence level, which allows us to consider the sample as a representative and to provide conclusions that might be applied generally for the overall 55+ active population.

Table 4.3 - Justification of the reliability of a sample

Indicator	Level
Sample size (n)	150
Total population size (N)	516.100
Confidence level	95%
Z-score corresponding to the confidence level (Z)	1.96
Assumed proportion, maximizing the margin of error (p)	0.5
Margin of error	8,00%
Confidence Interval	[42.00% – 58.00%)

Source: Author

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The questionnaire was designed and prepared by the EDSAW consortium and consists of 31 questions. These questions were developed to identify gaps in the digital knowledge, skills, and competencies of the ageing workforce. The questionnaire is divided into seven parts:

- Socio-economic
- Digital skills
- Cybersecurity and data protection
- Specific digital skills competences
- Soft skills
- Motivation and training needs
- Continuous improvement and learning

An important aspect of the survey is the respondent structure, as it allows us to provide unbiased results and conclusions about the ageing workforce.
The respondent pool is almost evenly divided between males (49%) and females (51%). The average age of respondents is 55.6 years, with a median age of 55 years. Within the age groups, most respondents fall in the 50-55 age range, making up 53% of the sample. Those aged 55-59 represent 26%, while 21% belong to the 60-65 age group.
In terms of regional representation within Slovakia, the sample is distributed almost evenly across Slovak regions, with similar numbers of respondents from each region. Comparing the survey's regional distribution of participants to the distribution of the active population aged 55+ in the second quarter of 2024 (see Table 4.2), we find no substantial differences. The regional distribution of participants closely aligns with the distribution of the active population aged 55+ across Slovak regions.

Based on these questions, we might see that respondents are divide almost equality between males (49%) and females (51%). The average age of the respondents is 55,59 years and median age is 55 years. Within the age group, the most of respondents is from the group of 50-55 years' workforce – 53 % of respondents. Age group 55-59 is represented by 26 % of respondents and 21 % of respondents belongs to age group of 60-65 years. Giving the regions within Slovakia, the sample of respondents is distributed almost evenly giving the similar or the same number of respondents from each Slovak region. To compare the regional distribution of participants from the survey with the distribution of the active population in age 55+ in the 2nd quartal of the 2024, the Table 2 indicates that there are not substantial differences in the regional distribution of active population over 55 years among Slovak regions and the share of the participants from the different regions is almost in the conformity with the distribution of active population of age 55+.

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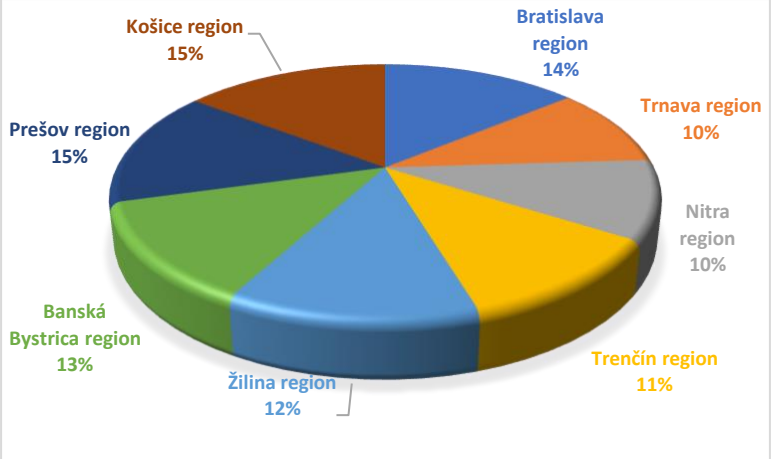
Figure 4.1: Regional distribution of the survey participants



Source: Author's own, based on data from the questionnaire

Table 4.4: Active population in age of 55+ (2024 – Q2)

Region / active population	**Active population 55+ (thousands)**	**Active population 55+ (% of total active population)**
Bratislava region	83,4	16.16
Trnava region	53,1	10.29
Trenčín region	56,7	10.99
Nitra region	68,2	13.21
Žilina region	60,5	11.72
Banská Bystrica region	63,4	12.28
Košice region	59,7	11.57
Prešov region	71,0	13.76
Slovak republic	516,1	x

Source: DATAcube

The level of education plays an important role in assessing the needs of the ageing workforce, as it is assumed that more educated workers possess greater knowledge and skills in comparison to those with lower level of education. In this manner, the needs of workers with higher education may differ from workers with lower education. Most respondents have completed full secondary education, followed by the master´s degree employees. There were no respondents only with basic education or with apprenticeship or professional education without high school diploma.

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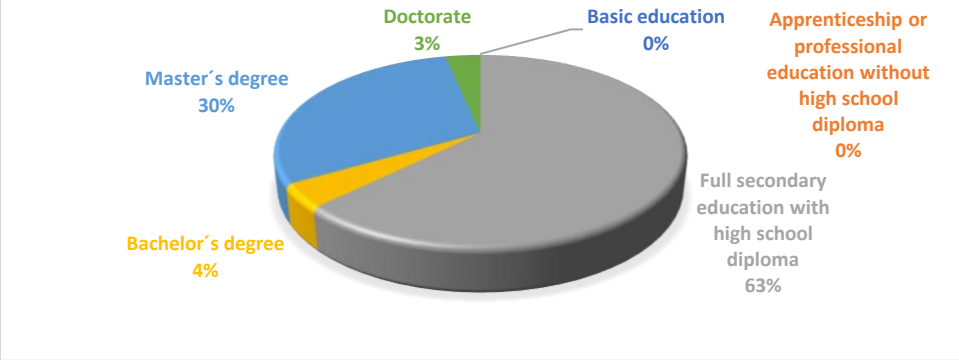
Figure 4.2: Level of education



Source: Author's own, based on data from the questionnaire

4.2.Analytical Approach

Questions in the survey were designated and scaled in a way that allow us to identify the real needs of ageing population in digital and soft skills. Descriptive statistics was used to analyse the main characteristics and scope of data gather from the survey. Based on these characteristics, we were able to find and reveal trends and patterns in responses from the ageing population. This enabled us to define the key characteristics relating to the digital and soft skills needs for the sample from the survey as well as to draw general conclusions that can be applied to the overall ageing workforce the Slovak Republic.

4.3.Findings – Digital Skills Needs

4.3.1. Current competence levels:

The most common index used to measure the level of digitalization is the Digital Economy and Society Index (DESI), which consists of 4 sub-indices – Human capital, Connectivity, Integration of digital technology, and Digital public services. In term of digitalization, Slovakia is not performing well. In 2002 DESI ranking, Slovakia is ranked 23rd out of 27 EU Member States (European Commission, 2022a, page 3). The position of Slovakia has worsened by 1 position as it ranks on 22nd position in 2021.
Slovakia is performing below the EU average, moreover, in recent years, the pace of digitalization in the EU has been increasing by higher pace than in Slovakia.

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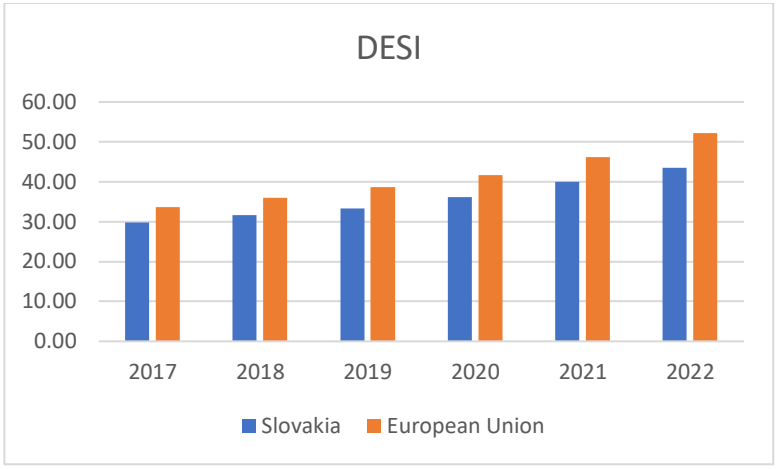
Figure 4.3: DESI index for Slovakia



Source: Authors, European Commission

The breakdown of the DESI index indicates that Slovakia is able to achieve similar level as the EU average only in the Human capital dimension, but is falling behind in all other areas of DESI index. With the particular relevance to the EDSAW project, a report for Slovakia highlights that digital skills across population, from primary school students to adults, need to improve in order to successfully address challenges of digital transformation. Improving digital skills takes time and measures need to be implemented systematically (European Commission, 2022a, page 3). In this context, the EDSAW project is well designed to address this gap in digitalization and enhance digital skills of ageing workforce.

Figure 4.4: DESI dimensions for Slovakia

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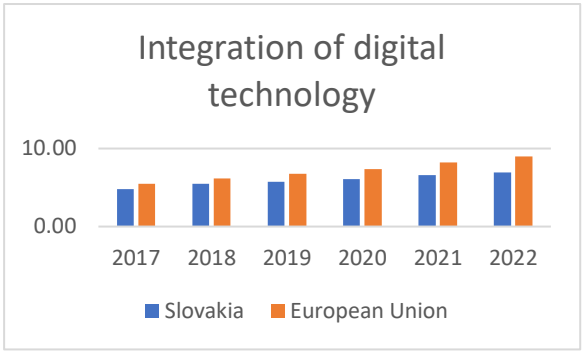

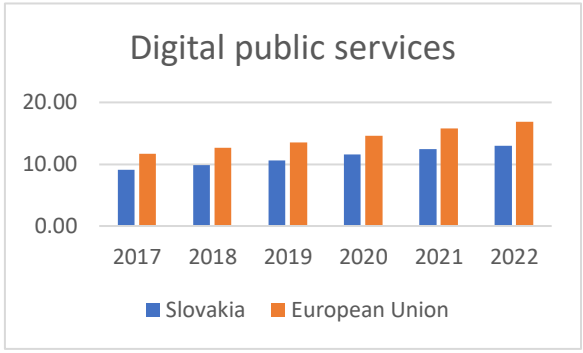

Source: Authors, European Commission

Slovakia needs to enhance digital skills. The indicator of basis digital skills has declined since 2021 from 55 % to 51 % of citizens, while the EU average is 55 %. Special attention is needed for the basic digital skills for people aged 55 to 64 (38%) and 65 to 74 (19%) (European Commission, 2024, p. 18). The improvement for the ageing workforce is thus necessary and the performance of this age group must increase to achieve the national target that is set by Slovakia for basic digital skills on level of 70% of citizens and even this goal is lower than the EU goal of 80 % citizens with basis digital skills.

4.3.2. Identifying of key digital skills gaps

To identify the key digital skills gaps, a survey was conducted among ageing workforce. The survey covered several aspects of digital and soft skills. The analysis follows this distribution of questions and summarizes the main findings. The questionnaire designated by the EDSAW consortium includes 31 questions. These questions were prepared to identify gaps in digital knowledge, skills and competencies of ageing workforce, and is divided to seven sections as mentioned in the text earlier.

Digital skills

The digital skills section of the survey consists of eight questions. The main goal of this part was to assess he level of digital skills, comfortability of the use of digital technologies and understanding of these tools among the ageing workforce, as well as to identify areas for improvement.

For employers, a key goal is ensuring that employees feel comfortable using new digital tools and software. This leads to higher labour productivity and better company performance. Therefore, the first question in the section focused on the comfortability of using new digital tools. Most employees feel comfortable or neutral when using new tools. Only a small portion feels very uncomfortable or uncomfortable. It is important to focus on these two groups, as well as those who feel neutral. Since the majority of respondents feel comfortable or very comfortable, the goal is to improve the comfort level of the less comfortable groups or even increase the comfort of those who are already comfortable.

The frequency of using various software or applications plays an important role in digital competencies. If digital tools are used regularly, it can be assumed that workers have a higher level of digital skills and knowledge. According to the survey, only 5% of employees do

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not use digital tools at work at all and 10 % use them rarely. In contrast, 42 % use software or other digital tools often and 28 % very often.

To use digital tools effectively, regular training to enhance digital competencies is needed. This training should be initiated by employers, knowing that digitally skilled labor leads to increased productivity. However, the survey indicates that one fifth of employees have not received any digital skills training from their employers, and almost one fifth have received only minimal training. About another fifth report receiving some training, but not enough. Comprehensive and sufficient training was provided to only 27% of employees. These results clearly show the need for more employees to receive proper training to understand and use digital tools.

The use of new and modern technologies, applications, or software is very common for office work. However, in any occupation, managing "paperwork" effectively is essential. As most documents and files are now in digital format, effective management is crucial. In this context, most respondents rate their skills in managing digital files at a medium level (36%). 24% consider themselves skilled, and 20% consider themselves very skilled. On the opposite side, 17% rate themselves as slightly skilled, and only 5% as not skilled at all. While this self-assessment seems adequate, there is a need to enhance the efficiency of managing digital files, particularly for those who are not skilled or only slightly skilled. It is also important to consider how respondents interpret managing digital files, as their self-assessment depends on their understanding of the task.

The next question was focused on the use of digital networking and video conferencing tools. The COVID-19 pandemic led to a rise in online meetings, which are more frequent recently. Online meetings offer many advantages, and it is expected that employees should be able not only to participate in but also to prepare, organize, plan, launch, and manage such meetings. The more online meetings employees successfully plan and complete, the more experienced they become. Therefore, the question on the frequency of the use of the video conferencing tools is important. The survey shows that 18% of respondents do not use these tools at all, and 20% use them rarely. 36% use them sometimes, while only 19% use video conferencing tools regularly, and only 7% use them very often. It seems that the shift towards remote work and online meetings has peaked, and more employers are now preferring on-site work without the need for video conferencing software.

Similar to working with digital files, storage of data and information has also become in digital forms. Files are no longer kept and stored in physical formats or in storage of devices, but in the cloud services. These allow employees to access files and data from any place, not being tied to the office or physical storage locations. This is also applied for the personal use of cloud services, such as storing family photos accessible to all family members from any place. Due to the increase in digital file usage, we would expect that use of cloud services would also increase. However, only 11 % of respondents is using cloud-based services very often and only 17 % often. Sometimes use is by 31 % of respondents, 23 % is using them rarely and even 18 % have never used them.

The reasons for not using cloud services might be explained by a non-comfortability and a lack of comfort with storing personal data or distrust and concerns about security, especially if data is stored in the cloud rather than physically or electronically within the company secured places. 51% of respondents indicated that they feel neither comfortable nor uncomfortable with the idea of personal data being stored on cloud servers. However, 31% feel slightly uncomfortable or uncomfortable, while only 18% feel somewhat or very comfortable. This suggests that there is a need to educate people about the security of data stored on cloud

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servers and the adequate and robust security measures to be taken in order to prevent misuse of stored data.

Moving to a more advanced level, some companies may already be using AI for administrative or management processes. The rapid pace of AI development and its use in the workplace means that not all employees are familiar with this technological concept. Based on the survey, there was any respondent considering to be very familiar with the generative AI and only 9 % is familiar. The most responses of somewhat familiar makes 36 % of answers. The most importantly, 29 % of respondents is unfamiliar and 26 % very unfamiliar with the generative AI and its application in the workplace. As more than half of the respondents are unfamiliar with AI, it is essential for the ageing workforce to address this gap by improving their knowledge and skills in this area. The focus on AI will be reflected in the courses developed for the ageing workforce, as it is becoming a crucial competence for success and competitiveness in the labour market.

Recommendation – digital skills

Based on the survey results related to the digital skills of the ageing workforce, several recommendations can be made. We found that training in the use of digital tools is insufficient and needs to be significantly expanded. Only 27% of respondents reported receiving comprehensive and sufficient training in digital tools. The rest of the respondents have received no training at all, minimal training of some aspects, but not sufficient training. We believe that improving training in digital tools will also enhance other aspects of digital competency, such as comfort with using new tools, frequency of usage, ability to manage digital files, use of video conferencing tools, and use of cloud-based services. Additionally, providing training on the security of cloud services and overall cybersecurity would help improve comfort with personal data storage in the cloud. Another key recommendation relates to the improvement the knowledge and the use of the AI in the workplace. More than half of respondents (55%) is very unfamiliar or very unfamiliar with the use of the AI. Increasing the knowledge in this area would help ageing workforce became more competitive in the labour market and increase their labour productivity.

Cybersecurity and data protection

The section of the survey dedicated to cybersecurity and data protection contains three questions. The use of digital technologies and tools, including digital files and online communication, is highly effective but also introduces new threats that were not present or recognized in traditional "onsite" environments. Many individuals or companies have had their data lost, compromised, or misused. However, many of these situations could be avoided, as online attackers often exploit vulnerabilities caused by improper use of digital tools, such as breaking login credentials to gain control of digital services, including social media accounts, email accounts, or even bank accounts.

Starting with the key question, familiarity of respondents to cybersecurity, the majority of answers were neutral, with 41% indicating they were neither familiar nor unfamiliar. Only 2% reported being very familiar, while 25% were somewhat familiar. On the other hand, 9% were not familiar at all, and 23% were not very familiar. This indicates a significant portion of the ageing workforce is either unfamiliar, not very familiar, or neutral regarding cybersecurity. This highlights that cybersecurity needs to be a priority area for the ageing workforce. They

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must understand and learn how to protect themselves against these modern, and for many, previously unknown digital threats.

In terms of protecting against cyber threats, multiple methods of security are necessary. A strong password alone is no longer sufficient to protect accounts or prevent against breaking to accounts in digital environment. Therefore, most digital tools now offer, or even require, two-factor authentication. The survey shows that still 12% of respondents never use two-factor authentication, 11% rarely use it, and 18% use it only sometimes.

As mentioned in the text above, cyber attackers often use people's mistakes or lack of awareness, taking advantage of opportunities when they arise. Many times, we receive messages on social media, via email, or by SMS from unknown senders. Some of these messages are easily recognizable as attempts to gather information or data, but others are more difficult to identify, making it hard to distinguish between legitimate and potentially malicious messages. The survey results are quite reassuring, as only 1% of respondents reported being either not cautious at all or only cautious only sometimes when opening emails or clicking on links from unknown senders.

Recommendation – Cybersecurity and data protection

Regarding cybersecurity, it is evident that there is a need to increase the knowledge of the ageing workforce about cybersecurity concepts and provide training on protecting against digital threats. This includes using two-factor authentication and other protective measures.

Specific digital skills competence

Specific digital skills competence refers to employees' ability to use digital technologies and tools effectively and practically in their work. The application of digital tools in the workplace often focuses on office software, online communication (e.g. emails), and data analysis and visualization. An essential aspect of developing digital competence is the learning process, as different workers require varying amounts of time to understand and begin using digital tools efficiently. This section of the questionnaire comprises four questions, which are described below.

When adopting and learn new technologies and tools, understanding them is the first step, followed by practical usage. The more technologies and advanced tools employees use, the more confident they become. As the ageing workforce is assumed to use fewer digital technologies than younger generations, their confidence in learning and applying new technologies is often presumed to be lower. However, the survey results suggest otherwise. 17% of respondents always feel confident using new technologies, and 44% often feel confident. Only 1% never feel confident, and 6% rarely do. This indicates that most ageing workers aged 50–65 are confident in their ability to learn and use new digital tools and technologies.

Once digital tools or software are understood and put into use, competence grows. For both personal and professional use, proficiency in office software such as Microsoft Office or Google Workspace is particularly important. The survey revealed that most respondents consider themselves competent in using office software. Only 5% find it very difficult, and 12% struggle with its use. However, only 5% believe they excel at using office software effectively. Another significant aspect of office work is the ability to manage correspondence, particularly through email. Effective email management involves organizing emails, filtering and sorting them, and utilizing advanced features of email software. According to the survey, the ageing

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workforce is generally comfortable with email management. Only 3% and 10% of respondents, respectively, find it very difficult or struggle to manage emails effectively.

The last question in this section addressed data analysis and visualization. Modern tools provide numerous opportunities to present data and results effectively and engagingly to provide attractive presentations and data analysis. These skills are critical for creating presentations that attract potential customers, suppliers, or investors. Proficiency in software such as Microsoft Excel, SPSS, or Tableau is essential for leveraging these opportunities. The survey shows that 38% of respondents possess moderate skills in data analysis and visualization, while 23% use these tools effectively almost always. However, only 2% excel in this area. Conversely, a significant proportion of respondents' lack proficiency and not using these tools effectively, with 10% unable to use such tools and 27% having only limited skills. This group of ageing workers should be identified and provided with adequate training to enhance their data analysis and visualization capabilities, making them more competitive in the labour market.

Recommendation –Specific digital skills competence

The survey results indicate that the ageing workforce feels relatively confident in their ability to learn and use new digital technologies. However, their self-rated competence with office software is moderate at best. Approximately half of the respondents reported finding office software either challenging, very difficult, or struggled to use it effectively. Given their confidence in learning but the reported difficulties in software usage, offering more training sessions or courses would be highly beneficial to improve their competencies. Another area for improvement is the use of tools for data analysis and visualization. Most respondents have only limited skills or are unable to use such tools altogether. Addressing these skill gaps through tailored trainings would significantly enhance their digital competences and make them more competitive in the labour market.

Motivation and training needs

People often fear change. Many workers prefer to continue using familiar processes, software, and tools, resisting changes that may disrupt their routines. However, as the environment evolves, adapting to new digital technologies and tools becomes essential. Change is necessary. Workers are often afraid of changes due to fears of inefficiency with new technologies and the effort required to learn them. They may consider only a short-term perspective, focusing only on the immediate costs of learning and adopting new technologies. However, once they are able to recognize and understand the long-term benefits, such as simplifying the work, they would be more likely to accept the change. Employers play a crucial role in this process by motivating workers and providing adequate training to address initial concerns about the changes. This section includes three questions.

One way to enhance the adoption of new technologies and tools is by motivating workers. Motivation is critical in overcoming the initial fear of change. The motivation would be addressed in various forms, such as higher salaries, bonuses, or promotions. Motivation can be also intrinsic, coming from personal interest and a desire to familiarize with new technologies. However, some workers are not motivated to learn new technologies. Thus, identifying the reasons behind this lack of motivation is crucial. According to the survey, 51% of respondents are motivated to adopt new technologies by their personal interest, 23% due to higher salary, and 7% by the opportunity for promotion. However, 16% reported being not motivated to learn new technologies. Among the 3% who cited other motivations, responses

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included: improving work efficiency, necessity for the job, facilitation of tasks, personal development, and acquiring new skills.

As noted in the section on soft skills development, adopting new digital technologies can be stressful—especially when workers are unfamiliar with their features and capabilities. The survey revealed several common fears (multiple answers were allowed). The most frequently reported afraid of workers was making mistakes (66 responses), followed by the fear of being dismissed for an inability to use digital technology (39 responses). These fears reflect a negative perspective, as workers often associate mistakes with failure and potential job loss, particularly among the ageing workforce.

Only 20 answers were reported as not understanding the digital technology and only 9 as never use of digital technology before. Ageing workforce is more distressed by making mistake and being dismissed as the using and understanding of digital technology. Interestingly, 33 respondents mentioned other concerns, such as application freezing, insufficient technological equipment, connection failures, or needing to restart processes from the beginning. Many respondents reported no fear or stress related to using new technologies.

To alleviate stress and fear associated with adopting and using new technologies, effective training programs are essential. Training can be delivered in various formats, and preferences vary among workers. The survey allowed respondents to choose multiple options for preferred training methods. Practical examples were the most popular choice (86 responses), followed by onsite training (84 responses) and online video tutorials/training (53 responses). Written manuals were the least preferred option, with only 23 responses.

Practical examples were particularly favoured among the ageing workforce as they provide hands-on experience, allowing trainees to understand features and possibilities while testing the technology or tools directly. Similarly, onsite training was highly preferred, likely due to the physical presence of the trainer, who can address questions immediately and provide personal interaction.

Despite the preference for onsite training, online training methods, especially asynchronous formats, offer significant advantages in terms of cost-efficiency and time management. Virtual classes eliminate the need for travel or gathering participants in a classroom. Online courses also allow workers to learn at their own pace and in a time that suits them, which is particularly beneficial for workers that would be not able to attend online classes scheduled during their working hours.

Recommendation –Motivation and training needs

The survey results revealed encouraging findings regarding motivation to learn new digital technologies. The majority of respondents reported intrinsic motivation driven by interest in new technologies. Intrinsic motivation is often more effective than extrinsic factors such as salary or promotions. However, 16% of respondents lacked motivation entirely. Efforts should focus on identifying incentives to motivate this group to learn and use new digital technologies. The survey also highlighted key sources of stress related to digital technology adoption and ist use. The most common concerns were the afraid of making mistakes (66 responses) and the fear of being dismissed for incompetence with digital tools (39 responses). These fears can be moderated or even totally suppressed through comprehensive training programs that focus on practical examples and hands-on practice. Familiarity and experience with digital tools will reduce fears of mistakes and improve confidence in using new technologies. Regarding training preferences, practical examples (86 responses) were the most

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favoured method, followed closely by onsite training (84 responses) and online video tutorials or training (53 responses). While the ageing workforce tends to prefer onsite training due to the personal interaction it offers, online training methods should also be considered for their cost-efficiency and flexibility. Asynchronous online training, in particular, offers significant advantages, allowing workers to learn at their own pace and during convenient times. Employers should weigh the benefits of onsite training against the travel and financial advantages of online training formats to create effective and accessible learning opportunities for their workforce.

Key digital skills gaps – summary
Based on the conducted survey and previous analyses, we have identified key digital gaps among the ageing workforce in areas such as digital skills training, continuous learning, comfort with digital tools, and cybersecurity. These gaps can be addressed effectively through tailored training programs designed specifically for the ageing workforce. Each course or training initiative should consider their unique needs, existing knowledge, and the pace at which they learn and adapt to new technologies. As noted in the DESI report for 2022, digital skills are part of the Recovery and Resilience Plan in Slovakia as Slovakia will update school curricula and learning materials to include digital skills and teach computational thinking (European Commission, 2022b, page 27).

4.3.3. Implication s for labour market outcomes

The role of the ageing workforce in Slovakia is expected to grow due to demographic trends and the emigration of younger workers seeking employment abroad. Combined with the general shortage of ICT specialist on the EU labour market (European Commission, 2022b, page 14), the Slovakia would struggle with shortage of "digitally" skilled and qualified workers. Enhancing the digital skills of the ageing workforce can create positive outcomes by combining their extensive experience with the knowledge and application of new digital technologies.
The most relevant DESI parameter to be observed for the labour market is the Human capital. In this dimension, Slovakia scores below the EU average, with a score of 44.1 compared to the EU average of 45.7 placing Slovakia in the 19th position among EU countries. 55% of Slovaks have basic digital skills, which is slightly above the EU average of 54%. However, only a 21% of Slovaks have advanced digital skills that is below the EU average of 26% (European Commission, 2022a, page 6). As seen, there is a huge gap that needs to be filled-up. Slovakia is lagging behind also in ICT specialists (4.3% vs 4.5%) and in female ICT specialists (15% vs 19%). However, the positive information is that variable ICT graduates is higher than the EU average (4.4% for Slovakia and 3.9% for EU). The survey has also pointed out, continuous training and improvement in digital skills in the workplace are insufficient. Data from the DESI revels the same result. Slovakia has a low percentage of enterprises providing ICT trainings. Trainings are provided only by 16% of enterprises, while it is 20 % for the EU average.

4.4.Findings – Soft Skills Needs

4.4.1. Current competency levels:

As mentioned above, the quality of human capital relating to the digital skills in Slovakia is slightly above the average of the EU. However, Slovakia is lagging behind in areas as basic and advanced digital skills and providing of trainings. Enterprises actively engaging in trading and development (T&D) demonstrate reduced demand for cognitive and digital skills from

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external origins, indicating their capacity to fulfil job roles using their internal resources via T&D efforts. However, these assumptions did not hold true for communication and social skills. The most notable level of demand was observed for digital skills (Coculova & Svetozarova, 2024, pages 6-7). Based on the conclusion of above-mentioned analysis, enterprises are currently not able to increase communication and social skills. The ageing workforce must adapt to new conditions and requirements in communication and social skills. In the following section, we identify the key soft skills gaps that need to be considered to improve the performance of ageing workforce.

4.4.2. Key soft skills gaps

Soft skills

Focusing solely on digital skills and competencies to understand and use the new digital technologies and tools would be not sufficient without disposing and accompanying development of soft skills. The work in the team, effective communication, active listening and ability to give and receive constructive feedback are essential for the effective work, professional success or promotion. The ageing workforce often struggles to adapt to new forms and methods of teamwork and communication. For this reason, there is necessity to help the ageing workforce with getting familiarized with these practices. The section of the survey relating to the softs skills includes six questions.

Starting with the communication, each effective worker must be equipped with the effective communication and active listening skills. These skills are essential and lead to effective personnel management and team cooperation within the workplace. Each person needs to learn how to communicate his/her ideas, views, or comments and on the other side must be attentive listener to understand the views of others. According to the survey, most of the respondents rated their effective communication and listening skills positively, 53 % as good and 14 % as excellent. Very poor and poor communication and listening skills were answered by 1 %, respectively 3 % of respondents.

Another part of pleasant working environment is the effective co-working with team members. To achieve this, there must be trust and good relationship between co-workers or team members. The lack of the trust between team members, poor and not effective communication and bad relations at the workplace decrease the labour productivity as well as negatively effects workers also in their personal lives. Therefore, building the trust and good relationship is essential at any workplace for any position within the company hierarchy. Positively, respondents from ageing workforce mostly find it neither difficult nor easy and quite easy to build the trust and relationship with colleagues (80 % of responses). Only 1 % consider the building trust and good relationship as very difficult, while on the opposite spectrum, 12 % people find it very easy.

To communicate the feedback or receive it might be sometimes very difficult and challenging. When providing or receiving feedback, the objectivity is necessary. Providing feedback (even positive nor negative) must be considered as the review of the performance and the head of the team or the manager must point directly particular positive and negative aspects of performance of the employee. The general feedback without expressing specific aspects is not effective and will not improve the performance. By many employees, receiving of feedback (the negative one) is very often considered as critique. However, it should be considered as the help and suggestions to improve the work performance. The survey reveals that mostly, respondents are neither comfortable not uncomfortable (46 %) or comfortable (44 %) with

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providing constructive feedback. Only 6 % is very uncomfortable or uncomfortable with the feedback providing, while very comfortable is 4 % of respondents.

The result for the receiving feedback is very similar with most of respondents neither comfortable not uncomfortable receiving feedback and relatively small group of ageing workforce very uncomfortable and uncomfortable.

Teamwork and cooperation of co-workers requires to understand the management processes. As there is always a continuous development in managing human resources, the effective worker would understand different types of management processes. Despite the importance of this knowledge, majority of ageing workforce (77%) is not familiar with any of predefined management processes in the survey question and only 13 % of respondents know all of them. Besides the given management processes in the question, there was any answer for knowing other management processes. Number of respondents that have reported to know some of predefined management processes is as follows: Kanban – 5, Kaizen – 7, Total Quality Management – 5, and Just in Time – 9. Increasing awareness and understanding of management processes would improve the compatibility of the ageing workforce with modern workplace dynamics. Therefore, it is necessary to educate ageing workforce also in management processes.

The adoption and use of new and modern digital technologies might often cause stress and discomfort when we have to learn how to work with them. This is also reason, why many people refuse to adopt new technologies. The stress and uncertainty relating to digitalization might affect the work performance and is necessary to decrease it at the lowest possible level, e.g. by trainings or practical examples of using digital tools. Most of the respondents from ageing workforce answered that they considered themselves as quite effective to manage stress and uncertainty in workplace related to digitalization (43%) and very effective (9%). Somewhat effective is responded by 38%. Only 10% of ageing workforce think they are hardly ever effective (9%) or not effective at all (1%).

Recommendation –Soft skills

The ageing workforce has extensive working experiences in their professional life bringing a wealth of professional experience. However, the environment, including co-workers is changing and ageing workforce needs to adopt to new conditions. The survey reveals that almost half of the respondents found it neither difficult nor easy, quite difficult or very difficult to build trust and good relationship with co-workers or team members. Thus, teamwork is one of the areas, we consider ageing workforce needs to improve and we suggest to enhance this soft skill by more extensive training and more teamwork within the existing courses focused on education of ageing workforce. Another area from soft skills where the improvement is needed is providing and receiving constructive feedback to/from co-workers as almost half of the respondents in both those aspects fell neither comfortable nor uncomfortable, uncomfortable or very uncomfortable. The active communication is essential in the work of the team to achieve the given goals and increase the team performance. Within the soft skills, understanding and knowing management process is also very important. However, 77% of respondents do not know any of the management processes that were predefined in the question (Kanban, Kaizen, Total Quality Management, Just in Time). Based on the survey results, the knowledge about management processes and their understanding would increase the competences, and consequently the competitiveness of ageing workforce in the labour market.

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Continuous improvement and learning

Technologies evolve rapidly and technological development is very dynamic. Digital technologies and tools that were used some time ago are outdated in some years, even months. Employers and employees have to react and address to these changes, otherwise they will lose the technological advantage. The statement that once I learn new technology and I will not need to learn any new is not applicable in the current setting and continuous improvements. If such approach is applied by the workers, they will never succeed and be competitive at the labour market. If by company and its attitude to trainings for employees and continuous improvement, probably will lag behind and go to bankruptcy. Along with the technological progress, the continuous learning must follow. Without continuous learning, technologies move away from workers and they have not chance to succeed in the labour market. The only way to became competitive is to follow new technological trends and be familiarized with them. The section on continuous improvement and learning consists of three questions.

The condition for staying in touch and becoming familiarized with new digital technologies is participation in improvement initiatives at the workplace. A successful company knows that organizing events, establishing motivation schemes, or implementing other improvement programs will increase the knowledge and skills of workers, thereby enhancing labour productivity, satisfaction, and commitment. Surprisingly, 22% of respondents have never actively participated in continuous improvement initiatives in the workplace, and only 25% did so rarely. On the other hand, only 6% always and 18% often actively participated in such initiatives. The result indicates that there is a need for more active participation in continuous learning. The results do not clarify whether the lack of active participation is due to employees' low commitment or motivation, or the limited availability of such programs and schemes offered by employers.

The adoption of new digital technologies and tools relates to the changes within the workplace that may bring some uncertainties. However, training and familiarization with technologies that will be adopted and used can mitigate these uncertainties as employees get understanding and confidence in using the new technology. Most respondents have a neutral attitude, finding it neither easy nor difficult to deal with changes and uncertainty (44%). Additionally, 28% find it relatively easy, and 6% find it very easy. On the other hand, 19% of respondents find it quite difficult to deal with changes and uncertainty, while 3% find it very difficult.

The concept of continuous improvement should be recognized by every employee and supported by every employer. Such an approach would facilitate the understanding and use of new technologies and tools. However, 46% of respondents reported they are somewhat familiar but do not apply it much, 21% are not familiar at all and only one third – 33% is very familiar with the concept of continuous improvement and apply it regularly.

Recommendation – Continuous improvement and learning

The ageing workforce needs to continually improved digital and soft skills to be competitive on the labour market. However, survey reveals that most of the ageing workforce has never, rarely or only sometimes (76% of respondents) actively participate in continuous improvement initiatives in their workplace. This situation might lead to lacking-off the digital and soft skills of ageing workforce in comparison to younger co-workers. Employers need to consider this situation and focus on initiatives focused on ageing workforce and support its long-term experience in these aspects of professional work.

Key soft skills gaps – summary

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Based on the conducted survey and the previous analysis, we have identified the key soft skills needs of the ageing workforce. We believe that teamwork and understanding management processes need improvement. Similar to digital skills, these improvements can be achieved through appropriate training tailored to the ageing workforce. Each course or training should consider the specific needs of the ageing workforce, their current knowledge, and their pace of learning and adapting soft skills in the workplace.

4.5. Conclusions and Recommendations

The rapid changes in the working environment, including changes in technologies, required soft skills, and communication skills, are putting pressure on the ageing workforce to adapt to new conditions. Many workers over 50 might feel stressed and demotivated due to the increasing demands to use new digital technologies and the corresponding requirements for their roles. Learning new technology and using it correctly is very challenging, and many in the ageing workforce might forego potential promotions or career advancements due to discomfort with digital technologies.

However, the ageing workforce offers extensive experience. For this reason, it is necessary to increase awareness of digital skills among the ageing workforce. Based on the conducted survey, we have identified that the ageing workforce needs proper training in the use of digital technologies and in improving soft skills. Training in these areas, along with practical examples, exercises, and opportunities to try out digital tools under the supervision of experienced trainers, will increase the comfort level of the ageing workforce in using new digital technologies. This, in turn, will result in higher work performance and greater competitiveness in the labour market.

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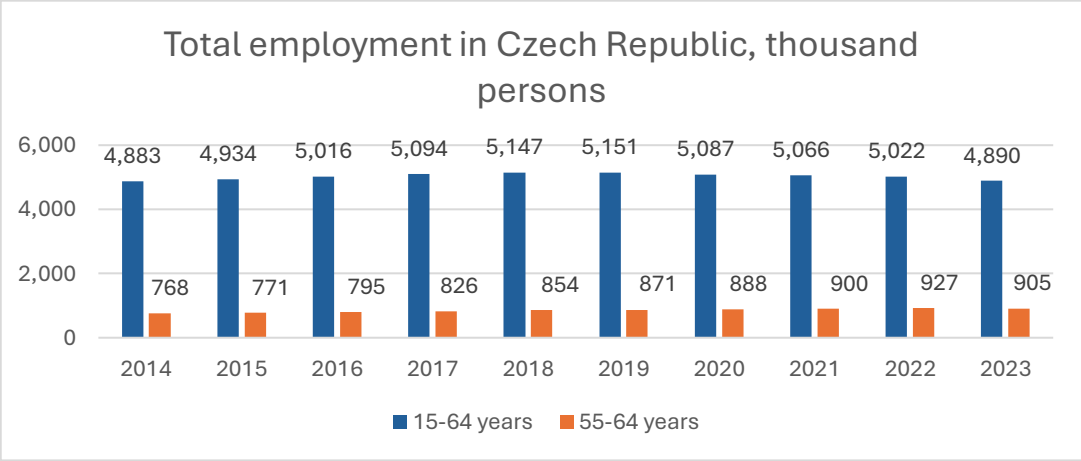
5. Needs analysis country report: Czech Republic

5.1.Methodology

The sampling method chosen for the survey conducted among respondents in the Czech Republic was **Stratified Random Sampling**. This approach was selected due to its widespread use in research, **as it effectively minimizes bias and enhances the accuracy of results**. Stratified random sampling is an efficient methodology for obtaining unbiased outcomes in research. By dividing the population into subgroups and randomly selecting samples from each subgroup, this method ensures that the sample is representative of the entire population, thereby reducing bias and increasing the precision of the results. Additionally, **the advantages of stratified random sampling include reduced sampling error, improved accuracy, efficient resource utilization, and enhanced generalizability of the findings**. The total **number of respondents was 114**. To determine the sufficiency of the sample, it was necessary to study the number of workers aged 55-64 years in the Czech Republic (Figure 5.1). In our survey, our respondents were aged 50 to 64. This age category differs from the one used by European commission and Eurostat.

Figure 5.1- Comparative characteristics of the total number of workers and the age group 55-64 years



Source: based on (Eurostat, 2024)

The presented figure characterizes the trend of increasing the share of the working population aged 55 to 64 years, so if in 2014 this age group accounted for 15.7% of the total number of workers, then in 2023 the share reached 18.%.

The results of calculating the sufficiency of the sample in 114 respondents out of 905,000 workers aged 55 to 64 years are presented in the table.

Table 5.1 -Justification of the reliability of a sample

Indicator	Level
sample size (n)	114
total population size (N)	905,000
confidence level	95%
Z-score corresponding to the confidence level (Z)	1.96
assumed proportion, maximizing the margin of error (p)	0.5
Margin of error	9.17%

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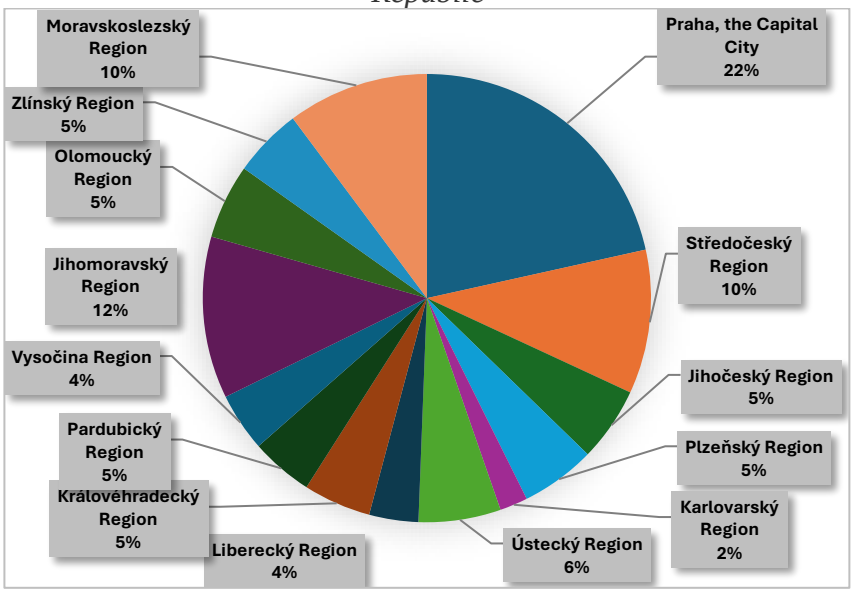
Confidence Interval	[25.83%, 44.17%]

Source: Author's own, based on data from the questionnaire

The sample size of 114 respondents out of a population of 905,000 provides a 9.17% margin of error at a 95% confidence level. While this margin of error is larger than ideal (5%), it still allows for general insights into the population. The sample can give directional insights and identify trends.

However, considering the target population - employed individuals aged 50-65 in the Czech Republic - and the need for representation across all 14 regions, this sample size is justified. It ensures that each region had proportional representation, thereby maintaining the integrity and representativeness of the sample. The distribution of the employment population of the Czech Republic in percentage terms for the first quarter of 2024 by region is presented in the Figure 5.2.

Figure 5.2- Chart of regional distribution of the employment population of the Czech Republic



Source: based on (Czech Statistical Office, 2024).

In accordance with the analyzed statistical data, 114 respondents were distributed according to administrative regions (Table 5.2).

Table 5.2 - Regional distribution of respondents

Region	Number of respondents	Proportion
Czech Republic	**114**	**100%**
Praha, the Capital City	18	16%
Středočeský Region	17	15%
Jihočeský Region	8	7%
Plzeňský Region	6	5%
Karlovarský Region	3	3%
Ústecký Region	6	5%
Liberecký Region	5	4%

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Královéhradecký Region	7	6%
Pardubický Region	6	5%
Vysočina Region	5	4%
Jihomoravský Region	11	10%
Olomoucký Region	7	6%
Zlínský Region	7	6%
Moravskoslezský Region	9	8%

Source: Author's own, based on data from the questionnaire

The distribution of the sample by region also reflects population density and regional characteristics. Prague with 16% of respondents, this matches its status as the most densely populated and urbanized region. Central Bohemian Region - 15% of respondents, reflecting its large population and proximity to Prague. Other regions such as South Bohemian, Moravian-Silesian and South Moravian regions also had significant representation, which is crucial to reflecting the diversity in socio-economic and cultural contexts across the country.

The sample was carefully stratified to reflect key demographic characteristics such as age and gender. **The respondents were split into three age groups: 32% were aged 50-55, 33% were aged 55-59, and 35% were aged 60-65. The gender distribution among participants was 42% male and 58% female, with no non-binary participants. Educational attainment among the respondents varied, with 29% having completed secondary education with a high school diploma or equivalent, 52% holding a university degree, and 19% possessing a doctoral degree**.

The data was gathered using a questionnaire that consisted of 31 multiple-choice questions. The questionnaire was distributed to selected companies, government institutions, including universities and schools, and various stakeholders, who were randomly chosen to participate. The response rate for the survey was 27%. **The distribution methods included electronic distribution, postal mail, and in-person delivery. The questionnaire was distributed between July 1st and August 10th, 2024.**

5.2. Analytical Approach

The questions in the survey were designed to adequately cover the needs of older workers in the Czech Republic, particularly in the areas of digitalization and relevant skills essential for them today. The goal was to gather detailed data on the specific skills and knowledge older workers need to function effectively in the modern work environment. We used descriptive statistics to analyse the data, which enabled us to identify the main trends and characteristics of the responses. This analytical approach provided us with a clear picture of the current digital and related skills needs for this age group. With these findings, **we were able to draw general conclusions that are not limited to a specific sample of respondents but are broadly applicable to the entire population of older workers in the Czech Republic**. Based on these conclusions, we were then able to make **specific recommendations** to support older workers in various professions, both in developing their digital competencies and in other areas crucial for their successful employment in the labour market. In this way, **the skills gap** between older and younger workers can be bridged, contributing to better integration of older workers into the modern work environment and enhancing their competitiveness in the labour market.

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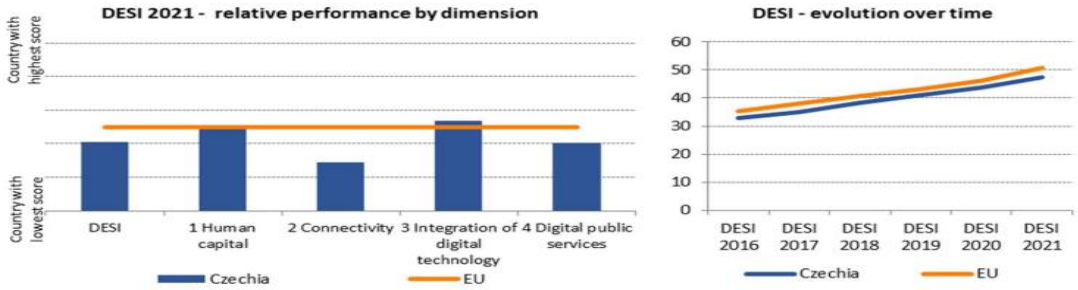
5.3.Findings - Digital Skills Needs

5.3.1. Current competence levels

The interpretation of the survey results of digital skills considered the Digital Economy and Society Index (DESI) and the assessment of individuals' basic or above basic digital competencies. According to the 2021 DESI Report for Czechia, "Czechia ranks 18th out of 27 EU Member States in the 2021 edition of the Digital Economy and Society Index (DESI), a decline of one position compared to the 2020 ranking. Czechia demonstrates its strongest performance in the Integration of Digital Technology, ranking 15th among EU countries" (European Commission, 2021, p. 3).

Figure 5.3 - DESI of the Czech Republic



Source: (European Commission, 2021, p.4)

These findings underscore the need for enhanced digital skills at the fundamental level, despite notable advancements in the integration of digital technologies. This suggests a gap between digital technology integration and the digital literacy of the population, which may impede further digital transformation efforts.

"69.1% of the population has at least a basic level of digital skills, well above the EU average - 55.6%." (European Commission, 2024).When assessing the digital skills of individuals (age factor) in the Czech Republic, several key aspects should be highlighted (Figure 5.4).

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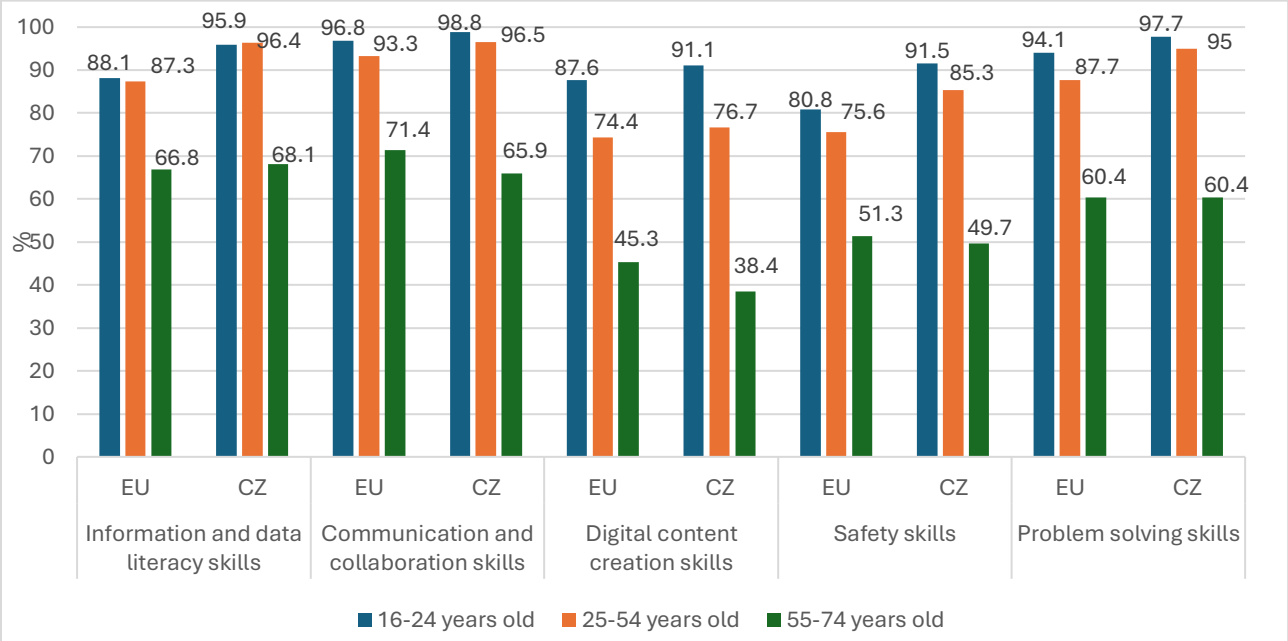
Figure 5.4 - Chat of digital skills in the Czech Republic and EU, according to age groups, 2021



Source: Based on https://digital-agenda-data.eu/

Overall, the country surpasses the EU average in all categories of digital skills, with the exception of older individuals (aged 55-74), where the EU holds a 2.1 percentage point advantage. However, **the disparity between the digital competencies of younger and older individuals in the Czech Republic has reached 50.7 percentage points, significantly larger than the EU average gap of 36.6 percentage points**. "More than 80% of people under the age of 44 have a basic level of digital skills; however, this rate drops to less than 60% for people aged 55-64 and to 25% for people over 64" (European Commission, 2024, p. 20). This stark difference indicates that older individuals in the Czech Republic are lagging considerably behind their younger counterparts. If left unaddressed, this gap is likely to widen further, given the rapid pace of digitalization.

5.3.2. Identify key digital skills gaps

The survey results highlight critical digital skills gaps among workers aged 55-65 in the Czech Republic (Annex 1). These gaps are primarily **concentrated in the areas of cybersecurity awareness, use of digital security measures, and comfort with digital tools**. 45% of respondents are either "Not familiar at all" or "Not very familiar" with cybersecurity concepts, indicating a significant lack of knowledge about essential digital safety practices. This is critical as **it leaves older workers vulnerable to security breaches and exposes organizations to potential risks**.

47% of respondents don't or rarely use two-factor authentication, showing a reluctance or lack of understanding of the importance of this basic security measure. (Annex 2) Only a small proportion of respondents use such security practices regularly, highlighting a substantial gap in the implementation of essential digital safety protocols. The low usage of two-factor authentication further highlights the gap in cybersecurity practices. Without such measures, **workers are more susceptible to hacking, phishing, and other online threats. This gap**

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indicates a need for better training on how to secure online accounts, especially given the increasing reliance on digital platforms in the workplace.

While there is a considerable portion of respondents who exercise caution when dealing with potentially harmful emails, there is still a significant segment that remains vulnerable to phishing attacks. **The combination of limited caution and low familiarity with cybersecurity can create serious vulnerabilities for both individuals and their employers**. This lack of familiarity with cybersecurity concepts is concerning, as it may leave workers vulnerable to online threats and less capable of protecting both personal and workplace data. These gaps pose challenges not only to the individual employability and productivity of older workers but also to their long-term job retention. **Addressing these skills deficiencies through targeted training and support programs is essential for ensuring that older workers can remain competitive and productive in an increasingly digital economy**.

One of the findings is that many older workers lack confidence in learning and using new digital tools - around 29% of respondents either never or rarely feel confident in this regard (Annex 3). Only about 40% feel confident regularly, which suggests that a large portion of older workers may struggle with adapting to new technologies, which is increasingly important in today's work environment. Another major issue is with the use of office software, a basic necessity in most jobs. Around 23% of respondents find it difficult to use such software effectively, while 43% feel neutral about it. Only a small proportion, 34%, say they are comfortable using it well, and just 4% feel they excel at using office programs like word processors or spreadsheets. This indicates a significant skills gap even in fundamental digital tools.

Email management, which is crucial for workplace communication, also poses challenges. 13% of respondents find it difficult to manage emails, and 42% are neutral, indicating that many may not be using advanced features like organizing or filtering emails, which can help improve productivity. **Only 45% feel they manage emails effectively, which points to a need for better digital communication skills**.

A striking finding from the survey is in data analysis and visualization, which is becoming increasingly relevant in many industries. A large chunk of respondents - 34% - say they can't use such tools at all, while 20% have only limited skills in this area. Only 21% feel comfortable using these tools effectively. Given the growing importance of data in decision-making, this represents a significant gap that could impact employability and productivity.

5.3.3. Implications for Labour Market Outcomes

The lack of digital skills, particularly in areas like cybersecurity and office software, puts older workers at a distinct disadvantage in the labour market. As more industries expect at least a basic level of digital competence, older employees may find it harder to secure or retain employment. This growing gap in digital fluency could lead to further age-related challenges, with employers more likely to favor candidates who are quicker to adapt to new technologies.

In fact, the **2021 DESI Report for the Czech Republic highlights that older workers are already trailing their younger counterparts by a significant margin - about 50.7 percentage points in digital competencies, much larger than the EU average** (European Commission, 2021). In terms of productivity, limited digital skills and low confidence with essential office tools and technologies directly impact how effectively older workers can perform their tasks. Whether it's managing emails, organizing data, or using basic office software, these tasks can take longer or may not be done as efficiently, leading to lower productivity overall. Moreover, **the inability to use tools like data analysis or visualization**

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software means older workers may miss out on contributing to strategic, data-driven decision-making, which is increasingly critical in many sectors.

Job retention is also at risk. As companies continue to adopt more digital technologies, employees who can't keep up with these changes face the possibility of job loss. **Digital literacy is now a standard expectation in many roles, and workers lacking these skills, especially in areas like cybersecurity or data management, are at a higher risk of being replaced.** Without proper training, older workers may struggle to stay relevant in their roles, potentially leading employers to seek out more digitally capable candidates or even automate tasks traditionally done by less tech-savvy employees.

Country-specific factors could either exacerbate or mitigate these issues. The Czech Republic has a well-developed digital infrastructure, which offers a solid foundation for training programs aimed at boosting digital literacy among older workers. For example, the Czech Republic ranks 15th (39.1) in the Integration of digital technology category (DESI), the EU average is 37.6 (European Commission, 2021). However, unless these workers are given the right access or motivation to engage with such training, the skills gap could continue to widen. Additionally, the Czech economy's focus on manufacturing, and the increasing adoption of automation and AI in this sector, means older workers in these industries face even more pressure to upskill or risk being left behind as digital transformation accelerates. On the positive side, Czechia ranks 15th in the EU for integrating digital technology, meaning there are plenty of opportunities for older workers to benefit from this shift—if they are provided with the right resources and training.

It should be noted, as part of the Recovery and Resilience Plan, EUR 280 million has been designated for the upskilling and reskilling of the workforce (European Commission, 2024). By 2025, various initiatives aim to assist 130,000 individuals in enhancing their digital capabilities. In 2023, Czechia introduced a pilot program under the active employment policy, offering a digital training course payment allowance. This initiative allows applicants to be reimbursed for up to 82% of the costs associated with digital training courses.

5.3.4. Findings - Soft Skills Needs

The survey shows (Annex 4) that **a significant proportion of respondents rate their communication and active listening skills as "average" (32%) or "good" (42%). But a notable 16% of workers rate their communication skills as "poor" or "very poor."** This indicates that while many older workers demonstrate adequate communication skills, a portion of the workforce may struggle with effective communication, which is essential for collaboration in the workplace.

55% of respondents find it either "quite easy" or "very easy" to build trust and relationships with co-workers, while 31% find it "quite difficult" or "very difficult." This suggests that while a majority feel capable of forming relationships, a significant minority face challenges in building rapport with their colleagues.

Older workers exhibit discomfort with providing feedback. Totally 35% are comfortable giving feedback. 19% feel uncomfortable in providing feedback, and a large portion (46%) remains neutral. This suggests a hesitancy in giving constructive feedback, which can hinder open communication and team dynamics in a professional setting.

The ability to manage stress and uncertainty, particularly with the increasing digitalization of the workplace, is an area of concern. **Only 26% of respondents feel they manage stress "quite effectively" or "very effectively,"** while 38% indicate they manage stress "somewhat effectively." Notably, 38% of workers feel they manage stress poorly, which

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could lead to reduced productivity, lower engagement, and increased workplace tension, especially as digital tools become more integrated into daily tasks.

These gaps in soft skills, such as communication, stress management, and feedback processes, can have tangible effects in the workplace. The difficulty some workers experience in building relationships or communicating effectively could lead to isolated work environments, strained team collaboration, and potential conflicts.

Hesitation to provide and receive feedback could slow personal and professional growth and limit improvements in workflow, collaboration, and employee development. Poor stress management, especially in response to digitalization, could result in decreased productivity, higher absenteeism, and burnout. Workers who struggle with technological change may feel overwhelmed, contributing to job dissatisfaction or early exits from the workforce.

There is a clear connection between soft skills and digital competencies. Many older workers find digitalization a source of stress and uncertainty, with 38% reporting difficulty managing stress related to digitalization. As digital technologies become more integral to office tasks, communication, and workflow management, workers who struggle with technology may also find their soft skills - like managing stress, providing feedback, and communicating effectively - under additional strain. The fear of mistakes or dismissal due to lack of digital skills (51%) further compounds these issues, leading to avoidance or reluctance to engage with new technologies, ultimately affecting workplace cohesion and individual performance.

5.4.Conclusion and Recommendations

Looking at the survey results, it's clear that there are a number of activities that could help address the digital and soft skills gaps among workers aged 50+ in the Czech Republic (Annex 6). **One of the main takeaways is that nearly half of the respondents prefer onsite training, which means that hands-on, face-to-face workshops would be particularly useful**. These could cover **areas like office software, basic cybersecurity, and data tools, where a lot of older workers seem to struggle.** For those hesitant about using technology or afraid of making mistakes, creating a learning environment where mistakes are encouraged as part of the process could ease their anxieties. Offering real-world examples during training would also help these workers apply their new skills with confidence. It would certainly be advisable to work more effectively with information technologies and to demonstrate to senior staff the advantages of these methods compared to traditional face-to-face training. Let’s motivate workers to engage more in online activities. One possible approach is **to create an online platform** that allows employees to become more familiar with technology and improve their digital skills. **Despite older workers’ preference for onsite training, using an e-learning platform provides them with important advantages**. E-learning platforms **allow them to return to the material they have already covered**, repeat it, or deepen their knowledge of specific topics. Modern e-learning platforms often **offer personalized learning paths,** which allows them to tailor the course to the level of training, interests, and speed of learning of each student. For older workers who may live in remote areas or have mobility issues, **online learning eliminates the need to travel to the training location**. A flexible learning format that allows older workers to master the materials **at their own time and pace**. This is especially important since many of them combine training with work and other commitments.

Another **big motivator for workers to learn digital skills is the potential for higher pay or promotions, which makes it clear** that linking training to career growth opportunities would be effective. Gamified platforms or certifications could be another way to engage those who are less motivated, offering rewards for progress in a fun, less formal way.

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When it comes to soft skills, a few workers find communication and feedback difficult, so workshops that focus on improving these areas through interactive activities like role-playing would be beneficial. **Regular peer feedback sessions could also help workers get more comfortable with giving** and receiving constructive feedback, which is a crucial part of workplace dynamics.

Stress management is another key issue, especially when it comes to handling digitalization. Since a significant portion of respondents report difficulty managing stress, organizing workshops that focus on resilience and coping strategies could really help. Combining digital training with soft skills development could also be useful - projects that require team collaboration, for example, would allow workers to practice both their technical skills and their communication abilities in one go.

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6. Needs analysis country report – Spain

6.1.Methodology

This report presents the results of a survey on needs analysis report to document and learn more about digital skills and to identify aging workforce digital needs in Spain.

We have used a **quantitative data analysis process** to analyse and interpret our numerical data. It has helped us make sense of information by identifying patterns, trends, and relationships between variables through mathematical calculations and statistical tests. Moreover, we made a **sampling method analysis data** that is numbers-based – or data that can be easily "converted" into numbers without losing any meaning. This supposed to measure differences between our groups and to assess relationships between our variables and involves the division of a population into smaller subgroups known as strata.

In response to the research questions, we controlled for variables relating to the demographic characteristics of the sample (age, gender and residence) and socioeconomic status (educational level) **re-codified into a categorical variable for a better analysis**.
On the other hand, in the area of digital skills we measure the digital skills level (rate and knowledge), training needs (learner profile) and soft skills (rate and knowledge).

The Survey does not focus so much on an objective measurement of digital skills, but rather on an observation according to habits of our population regarding their digital skills. To do this, we analyse the self-perception of digital skills from a broad and comprehensive perspective and digital self-confidence.

The survey was conducted **online by Google Form between June and July 2024** on a random sample composed by 86 workforces across the country obtaining a total of **69 valid questionnaires** using a quantitative research method. The intersection of the results identified current digital needs areas. Only the socio-demographic answers of the total 69-number sample are discussed (less of 50 years- old).

Furthermore, M&M's network is focused on **Catalonia** and also, we have a network in **Valencia**. However, for making the analysis more realistic we have focused our analysis on Catalonia (only 5 answers were obtained in Valencia).

To determine the sufficiency of the sample **(64 final answers)**, it was necessary to study the number of workers aged 50-64 years in the Catalonia (Spain) (Figure 6.1) and the participants from the different cities that have participated in the questionnaires (Barcelona, Cornella de Llobregat, Hospitalet de Llobregat - Sant Just Desvern, Molins de Rei, Cervelló , Sant Climent de Llobregat, Igualada, Cervera, Lleida, Esplugues de Llobregat and Viladecans (Figure 6.2).

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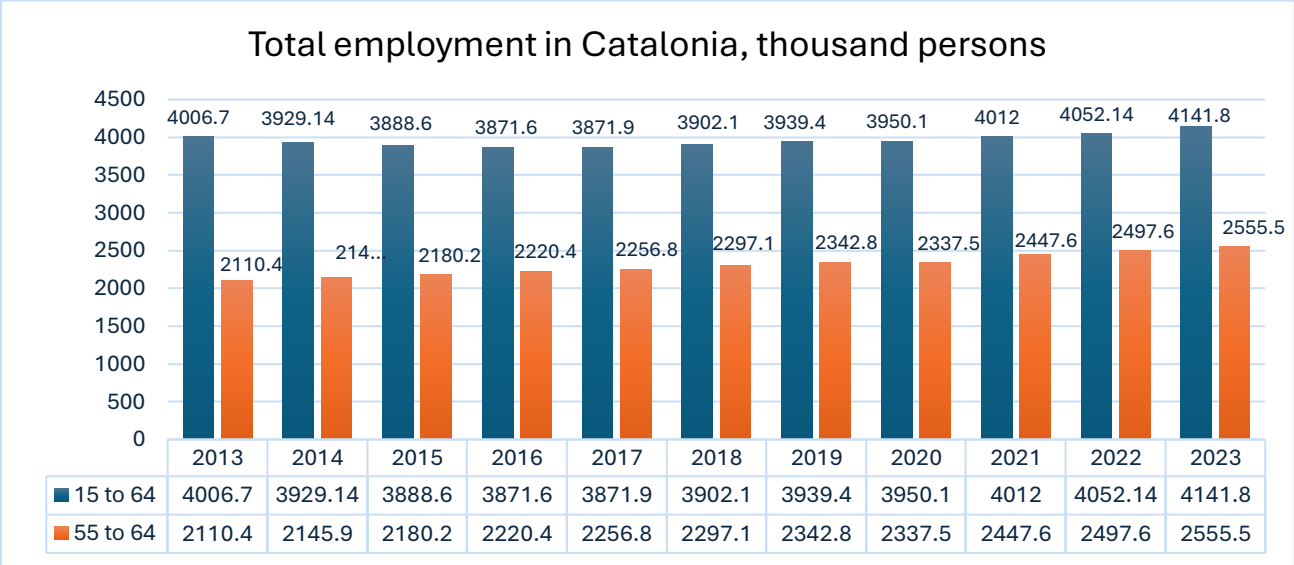
Figure 6.1. - Comparative characteristics of the total number of workers and the age group 55-64 years (Catalonia)



Source : Idescat. 2024

The figure shows how the working population aged 55 to 64 years has increased during the last years, so if in 2013 this age group accounted for 47,5% of the total number of workers, then in 2023 the share reached 65,7.%.

The results of calculating the sufficiency of the sample in 64 respondents out of 2.555.500 workers aged 55 to 64 years are presented in the table.

Table 6.1 - Justification of the reliability of a sample

Indicator	Level
sample size (n)	64
total population size (N)	2.555.500
confidence level	95%
Z-score corresponding to the confidence level (Z)	1.96
assumed proportion, maximizing the margin of error (p)	0.5
Margin of error	12%
Confidence Interval	[19.816% – 21.384%)

Source: Author's own

The sample size of 64 respondents out of a population of 2.555.500 provides a 12% margin of error at a 95% confidence level. While this margin of error is more of the double than ideal one (5%), it still allows for general insights into the population. Moreover, if we use the data of the of the 16 cities in which population lives (346.446 citizens) the margin of error is the same one (12%). We can say that the sample can be used for giving us guiding understandings and recognise tendencies.

On the other hand, it is important to consider and analyse the reality of the cities represented (16 cities) and justify the sample size of employed individuals aged 55-65 in Catalonia. Doing this it guarantees the value of the parameter with aquaricity, the minimum bias and that we have a relatively appropriate size and whose characteristics correspond to the population analysed and represent the sample from which it is extracted.

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The distribution of the employment population of the Catalonia (Participating cities) in percentage terms for the last quarter of 2022 is presented in the Table 6.2.

Table 6.2- Distribution of the employment population of participating cities

	Population	Employment Population
Barcelona	1.655.617	702.880
Cornella de Llobregat	90.078	38.243
Esplugues de Llobregat	46.968	19.381
Viladecans	66.615	30.420
Hospitalet de Llobregat	276.617	110.714
Sant Just Desvern	20.478	9.043
Molins de Rei	26.568	12.437
Cervelló	9.461	4.435
Sant Climent de Llobregat	4.190	2.109
Igualada	41.287	16.871
Cervera	9.468	4.243
Lleida	142.990	58.768
Terrassa	225.274	95.865
Mataró	129.613	53.868
Corbera	15.529	4.678
Berga	16.994	6.552

Source: Based on Idescat. 2022

The distribution of the sample by region also reflects population density and regional characteristics. Cities with high, medium and small density have participated. Barcelona with 40,6% of respondents matches its status as the most densely populated of participating cities. Considering Hospitalet de Llobregat, the second biggest city, and Viladecans (medium density) 15,6% of responders lived there. Other small cities, Cervera, Corbera, Sant Climent de Llobregat or Berga have also a participation (1,6%) of responders. This varied representation reflects the diversity in demographic and different context across the autonomy.

In accordance with the analyzed statistical data, 64 respondents were distributed according to Participating Cities (Table 6.3).

Table 6.3 – Participating Cities distribution of respondents

Region	Number of respondents	Proportion
Catalonia	**64**	**100%**
Barcelona	26	40,6%
Hospitalet de Llobregat	10	15,6%
Viladecans	10	15,6%
Cornellá de Llobregat	4	6,3%
Cervelló	3	4,7%
Cervera	1	1,6%
Molins de Rei	1	1,6%
Corbera	1	1,6%
Esplugues de Llobregat	1	1,6%

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Sant Climent de Llobregat	1	1,6%
Igualada	1	1,6%
Lerida	1	1,6%
Mataró	1	1,6%
Terrassa	1	1,6%
Sant Just Desvern	1	1,6%
Berga	1	1,6%

Source: Author's own

The sample was carefully stratified to reflect key demographic characteristics such as age and gender. The respondents were split into three age groups: 48,4% were aged 50-55, 35,9% were 55-59 and 15,6% were 60-65.

The gender distribution among participants was 37,5% male and 62,5 female, with no non-binary participants. **Educational attainment among the respondents varied, with 42,2% having completed secondary education with a high school diploma or equivalent, 54,7% holding a university degree, and 13,1% possessing a doctoral degree.**

The data was gathered using a questionnaire that consisted of 31 multiple-choice questions. The questionnaire was distributed to selected companies, workers and stakeholders, who were randomly chosen to participate. The survey was conducted online by Google Form between June and July 2024 on a random sample of 86 workforce across the country obtaining a total of 64 valid questionnaires using a quantitative research method. The intersection of the results identified current digital needs areas.

6.2.Analytical Approach

We have used a **quantitative data analysis process** to analyse and interpret our numerical data. It has helped us make sense of information by identifying patterns, trends, and relationships between variables through mathematical calculations and statistical tests. Moreover, we made a simple analysis data that is numbers-based – or data that can be easily "converted" into numbers without losing any meaning. This supposed to measure differences between our groups and to assess relationships between our variables.

In response to the research questions, we controlled for variables relating to the **demographic characteristics of the sample** (age, gender and residence) and **socioeconomic status** (educational level) re-codified into a categorical variable for a better analysis.

On the other hand, in the area of digital skills we measure **the digital skills level** (rate and knowledge), training needs (learner profile) and soft skills (rate and previous knowledge).

The Survey does not focus so much on an objective measurement of digital skills, but rather on an observation of the perception of our population regarding to their digital skills. To do this, we analyse the self-perception of digital skills from a broad and comprehensive perspective and digital self-confidence although, it can present biases and subjectivity.

The Survey is divided into three dimensions of analysis of the digital tool use: knowledge, Use and Utilization. In addition, for each of the dimensions, key axes of analysis are established to measure digital skills.

Furthermore, to adjust the questionnaire to our reality we made some adjustments:

Question 3.

What is your highest level of formal education achieved?

Less than secondary education

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Secondary education or equivalent
Higher Education (University or equivalent)
Doctorate

The education Spanish system is organized in this way and participants understand better this distribution.

Question 4:
Where do you reside?
Catalonia
Others communities

Complete in which city - town in Catalonia/Others communities?

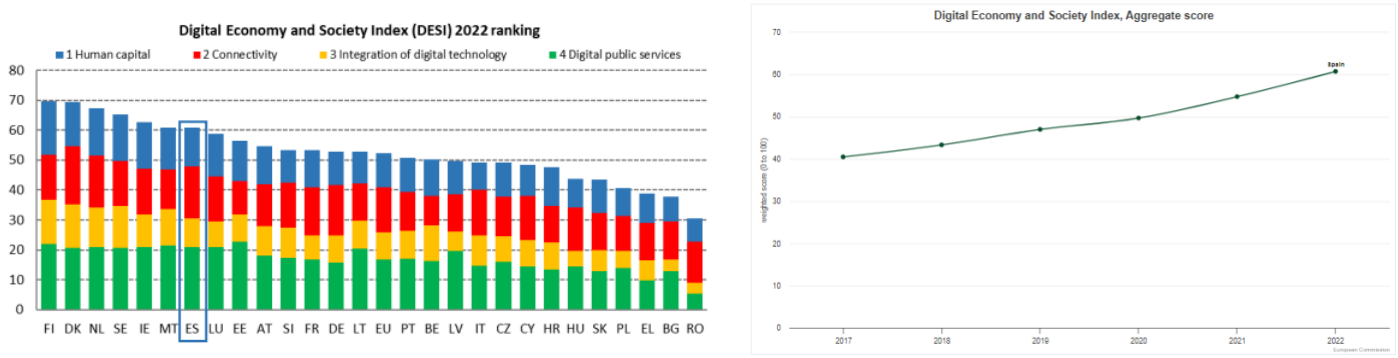
6.3.Findings - Digital Skills Needs

6.3.1. The Spanish reality

The European Centre for the Development of Vocational Training (CEDEFOP, 2023), a European Union (EU) agency, says that in the near future, around 90 % of job vacancies in Europe will require some type of digital expertise. The Talent Trends 2020 report issued by Randstad says that "profiles with the capacity to adapt and which have digital skills will be the most sought-after" and also stresses that companies new concept of talent will be entirely related to digitalisation and the incorporation of technology into business processes".

The first State of the Digital Economy and Society Index (DESI), published in September 2023, takes stock of the EU's progress towards successful digital transformation for people, businesses and the environment. The annex report for Spain acknowledges the country's significant progress in achieving the goals of the Digital Decade across. **Spain ranks 7th out of 27 EU Member States in the 2022 edition of the Digital Economy and Society Index** (European Commission, 2022)). The country is making relative progress and improving its performance compared to previous years, especially in terms of digital technology integration (ranked #11, five places better than in 2021), as well as in public digital services (ranked #5 compared to #7 in 2021) and in terms of human capital (ranked #10 compared to #12). Spain is one of the EU leaders in terms of connectivity and ranks #3 for the second consecutive year.

Figure 6.2 - DESI of Spain



Source: Based on European Commission, 2022, p 3

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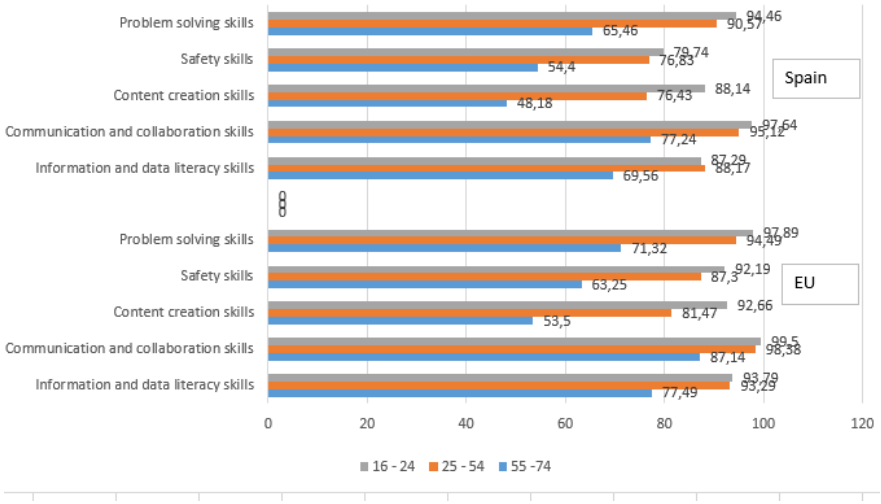
Regarding digital skills, **66,18% of the Spanish population has basic digital[1] skills (55.6% EU average) being the 53,80 % of population between 55 – 64 years old who has at least basic digital skills and 25,94% who has above basic digital skills. (European Commission, 2024). That is above the EU average of although Spain is not one of EU's front-runners. Average annual growth is 1.6% while the EU average is 1.5%.**

When comparing the digital skills of individuals (age factor) in the Spain, several key aspects should be emphasised (Figure 6.3).

Figure 6.3 – Chart of digital skills in the Spain and the EU, according to age groups, 2021



Source: Based on Eurostat (2024)

General, the country exceeds the EU average in all categories of digital skills. However, there is a **disproportion between the digital competencies of younger (who are above 80% in all the categories analysed) and older individuals** in the Spain. Age seems to be a significant factor, with a clear trend showing higher digital skills in younger age groups and a decline as age increases. This remarked digital gap indicates that older individuals in Spain needs to improve their digital skills and knowledge to be able to stay within the labour market and not feel socially excluded.

6.3.2. Identify key digital skills gaps

According to the Commission's report (European Commission, 2024), Spain is taking positive steps towards the integration of advanced technologies by companies: 12.3% of companies use AI, 89.1% of companies with ten or more employees have some measure in place. In the case of micro-enterprises, this percentage is 55.3% and 14.3% use Big Data for internal analysis. These new technological tools suppose that workers need to know how to use it. Furthermore, the report indicates that in terms of the digitalization of SMEs, Spain is practically in line with the European average: the percentage of companies with at least a basic level of digitalization is 68% compared to 69% in the EU.

[1] To have at least basic digital skills, people must know how to do at least one activity related to information and data literacy skills, communication and collaboration skills, digital content creation skills, safety skills and problem-solving skills.

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These results indicate the need of having workers skilled with digital knowledge and skills, but how is the reality of our participants?

We start for the general comfort using new digital tools and the knowledge /familiarity with the use of technologies. One of the pieces of information obtained shows that **25% of sometimes feel confident** in his ability to learn and use new digital tools and technologies (Annex 4) that added to the **15,6% who shows a neutral comfort** using new digital tools in his work (Annex 4), indicates that a medium – high proportion of older workers may have difficult **to adapt to the technological needs of laboral reality**. If our participants feel comfortable using new digital tools, does this mean that they consider to have a good level of knowledge and skills.? **Being comfortable with digital tools create a positive psychological mood, reducing stress and increasing productivity, that can affect positively the relationship between the user and the "machine - digital tool".** Data from CEDEFOP shows the importance of digital skills for jobs. In 2017, 71% of EU employees indicated that some fundamental level of digital skills was needed to perform their jobs. More recent data on skills that employers demand, based on millions of Online Job Advertisements (OJAs) in 28 European countries, extracted from the OVATE tool of CEDEFOP (2023) highline that digital skills are clearly mentioned by employers (e.g., “Working)

On the other hand, in the study on perception and level of trust in Spain "How citizens protect themselves against cyber risks" (ObservaCiber, 2021) 91.6% of the people surveyed for this study expressed the need to be trained in Internet security. This aspect indicates the not enough skills and knowledge about cybersecurity. Furthermore, as regards the degree of trust, 39.2% of Internet users in the last three months have little or no trust in the Internet, 55.7% have a fair amount of trust and 5.1% have a lot of trust. (Idescat, 2023)

How is the level of trust of our participants? In our case, we asked about data protection and the **23, 4% of them showed a not feel comfortable with the idea of her personal data being stored on cloud servers and 15,6% feel slightly comfortable** (Annex 4). To know better this feeling, the familiarity with cybersecurity concepts (Annex 4) gave us information about participants’ skills in this sense. **37,6% of responders are either “Not very familiar” or “Neither familiar not unfamiliar”**. Furthermore, the use of two-factor authentication is another importance measure for technology security (Annex 4). **Our results shows that only the 28,1% use it always and 14% of participants use either “never” or “rarely”.**

Finally, another factor that affects cybersecurity and that has been analysed is the safety protocols opening emails. Although the **57,8% are always very cautious still the 12,5%** still are cautious, but only sometimes what makes them susceptible to possible attacks. All these aspects **affect to protect organisation's people, information and systems to avoid harmful security breaches while enabling and prioritising mitigation actions should an attack occur.**

At the national level the INE (Instituto Nacional de Estadística, 2023) the data about the use of specific software for the job (For example for design, data analysis, processing.) shows that 59,6 % of responders (participants between 16 and 74 years – old) use it. Furthermore, the 83,7% exchange of emails or data entry in databases, 64,8% create or edit electronic documents and 43,7 % use applications to receive tasks or instructions (except e-mails). And which is the specific digital skills competence of our responders (Annex 4).

Starting with **data analysis and visualization** a large number of respondents – 23,1% - say they have only limited skills in this, while the 31,3% have moderate skills. **Only the 6,3% feel excel** and 37,5% is able to use them almost always effectively. Seeing how the data entry

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in database is one of the most used activities, this gap represents an important training need that affects to the employability of aging workers.

Office software and emailing are also two of the demanded specific software for the job. In our case, although the 81,2% felt confident using **office software** (either "excel" or "almost always able to use office software effectively"), still the **17,2% indicates a neutral feeling** what can indicate not having enough skills for using all the office software needed. On the other hand, also a high level of responders answered in a neutral way (21,6%) about **emailing management** that added with the **7,6% who aren't capable of using it correctly** pointed the necessity of answering this lack of digital skills.

Although all these gaps indicate the need of training and programs among workers aged 55-65 to increase their professional competitiveness, the reality in Spain is that although 9.6% of companies with 10 or more employees use Artificial Intelligence, 18.6% use Business Intelligence and 31.7% purchase Cloud Computing services, 31.7% of companies made sales through electronic commerce in 2022, increasing the volume of business generated by 20.3% compared to 2021, only 20% of Spanish companies invest in digital training for their employees, and, in the case of SMEs, this percentage drops to 4% (Idescat, 2023).

This reality is evident in our results in which the 21,9% answered not having received any training, 20,3% has received a minimal training and 24,4% some training, but not sufficient (Annex 1).

6.3.3. Implications for Labour Market Outcomes:

Spanish Labour Market

In 2023, 66.2% of the Spanish population had at least a basic level of digital skills, above the EU average of 55.6% (DESI, 2021). However, almost half of the Spanish population lack basic digital skills and 8% of the Spanish population have never used the internet. Also, **35% of the workforce have insufficient digital skills (DESI, 2021)**

Many other OJAs simply assume that candidates have digital. From artificial intelligence and big data analytics to cybersecurity and cloud computing, digital skills are the currency of prosperity in today's labour market. **Still, 27% of employed people in Spain do not know how to use email and up to 30% cannot make video calls over the internet, which excludes them from any employment with remote services.** (Instituto Nacional de Estadistica, 2021).

The section related to cybersecurity is another of the most deficient: **25% of employed people do not have the skills to manage their personal data or cookies,** which is a real labour problem, both from the perspective of the company and from that of each individual worker. (Instituto Nacional de Estadistica, 2021).

These training deficiencies are so severe that they dramatically limit the current and future employability of these people.

In an increasingly competitive labour market, companies are looking for people with digital skills to fill technology-related jobs. People with digital skills have a competitive advantage in the labour market and are better positioned to get well-paid and high-demand jobs.

Several measures outlined in **Spain's Recovery and Resilience Plan** support the acquisition of digital skills, especially for employees of SMEs. The plan includes significant reforms in this area, including the Digital Spain Agenda 2026, Digital connectivity, promotion of cybersecurity and deployment of 5G, the Artificial Intelligence strategy, the National Digital Skills Plan and a law on telecommunications to upgrade the regulatory framework with the development of new regulatory and enforcement instruments.

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To ensure equal access to digital opportunities the **Plan de Digitalización y Competencias Digitales del Sistema Educativo** (Plan for Digitalisation in education, 2022) will enhance access to digital learning through the provision of portable devices to at least 300,000 students from vulnerable groups in public or publicly subsidised schools. Also, **Educa en Digital initiative** (Educa en Digital, 2021) is part of Digital Spain 2026 agenda. It started in the 2020/2021 academic year aiming at closing the existing gaps in schools on access to technologies by increasing the quality of digital tools and providing teachers with training on digital. **Barcelona Digital Talent** offers a range of free services to raise awareness, guide, train and connect emerging digital talents with businesses, promotes ecosystem activities between businesses, training centres and institutions to generate debate and knowledge about the digital skills gap by organising community events, publishing reports on digital skills in different areas and organizing masterclasses for companies in different areas of common interest. **The IT Academy**, aims to foster digital talent among citizens in order to ensure digital growth and business competitiveness and the **National Institute of Cybersecurity** (INCIBE) that is organising the La Academia Hacker to promote learning and technical skills in cybersecurity.

Despite this technological reality the deficiency of technological knowledge distresses government agencies, education systems, technology industries and entrepreneurs alike.

Actually, 46% of Spanish companies have problems to find the digital profiles they need and look for (CEDEFOP, 2023). Technology roles such as those linked to data analysis, cloud computing, and application development are the hardest to fill.

6.4.Findings - Soft Skills Needs

The most notable results can be summarized as follows.

Although the effective communication and active listening is rated with a 26,6% as an excellent, it is also a 23,4% with an average valorization. Good communication in the workplace is one of the fundamental pillars of motivation and improved productivity. The flow of information within a company brings numerous benefits and the indicator shows that a high number of workers have a satisfactory communication skill.

About **feedback processes** (receiving and providing it), there is a balance between them: 29,7 % providing and 23,4% receiving constructive feedback answering very comfortable and 48,4 % - providing constructive feedback and 54,7- receiving constructive feedback choose very comfortable. **However, almost a quarter of respondents (receiving - 18.8% / providing - 20.3%) indicated a neutral feeling**. This poor feedback communication can lead to poorly executed work, repetitions of work, customer complaints, misinterpretations, conflicts between employees and reduces team collaboration and coordination and can affect the team organization and professional and personal relationships.

Another aspect analyzed has been the **stress management and uncertainly related to digitalization** (Annex 4). In this sense, Spain ranks as the fifth country with the highest level of stress among the members of the European Union (Eurostat, 2022). According to recent data, almost 70% of workers experience work-related stress at least once a week, compared to 62% before the pandemic in 2020. In addition, one in seven workers (around 15%) feels stressed every day

41% of employees attribute the increase in stress at work to the greater workload they have had to take. Other factors contributing to work stress include the length of the workday, cited by 28% of workers, technology-related issues, cited by 26%, and concerns about job security, cited by 25% of respondents. (Instituto Nacional Estadística – 2023).

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Only the 1,4 % of responders assess the **stress management in the workplace related to digitalization** as very effective or the 48,4 as quite effective. However, adding up hardly ever and not at all, a total of 14,1% selected these options, what is on line with the national results. The effects of work stress can result in burnout, reduced motivation, decreased job satisfaction, physical and mental health problems, low productivity, increased absenteeism, high turnover rates, low morale, interpersonal conflicts, and more. Offering training to deal with these situations, whose activators can be the digitalization, become one of the relevant actions to be implemented.

The last aspect asked was the knowledge about **management processes** (Kanban, Kaizen, Total Quality Management, Just in Time. The results shows that 65,6% don't know any of the processes and **only the 9,4% know all of them.**

The ones who know some of them, 27,5% indicated that the best known is kanban procedure, followed by kaizen, and just in time and ending with Total Quality Management.

Why is important this aspect? **Quality is important because it allows companies to differentiate themselves from the competition, offer a higher value product or service, and improve customer satisfaction and loyalty.** All of this translates into greater profit for the company. Therefore, it is essential that companies put special emphasis on ensuring the quality of their products and services, through proper quality management. That is why it is important to establish a quality management system and involve all employees in its implementation and monitoring.

6.5.Conclusions and Recommendations

With the rapid advancements in technology, it is no surprise that many individuals in the **aging workforce feel a sense of unease regarding the potential impact of digital tools on their career prospects**. Many aging workers in the late stages of their careers find participating in the digital economy challenging. Additionally, technology is becoming specialized, and one's productivity and competitiveness depend on their ability to use digital tools.

Workers aged 50 or over generally have a lack of exposure to digital tools, which prevents them from easily adapting to them and using them effectively. In addition, their resistance to change makes it difficult for them to learn how to use them due to their fear of the unknown. Likewise, **the lack of specific training for older workers** also widens the technological gap.

One of the attitudinal variables that has proven to be most relevant is the self-perception of one's own digital skills. Sociodemographic variables are relevant in explaining self-perception of skills but are qualified by the explanatory power of variables related to digital skills, as well as other attitudinal variables.

The relevance of sociodemographic variables has been observed, especially age (the older the person, the lower the perception of his or her own digital skills), the level of education (the higher the level of education, the greater the perception of ability). Likewise, the frequency with which digital devices are used also increases or decreases the self-perception of digital skills.

The reality shows that 71% of EU employees thought some fundamental level of digital skills was needed to perform their jobs and 74% of recruiters indicated that knowing how to use digital communication tools and video conferencing is also a crucial skill for job candidates to possess and in terms of digital skills.

Despite of the 66.2% of the population has basic or advanced skills the **46% of Spanish companies have problems to find the digital profiles they need and look for** (CEDEFOP, 2023).

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But what do the companies to solve the situation? Training can be one solution but only 20% of Spanish companies invest in digital training for their employees, and, in the case of SMEs, this percentage drops to 4%. Furthermore, 27% of employed people in Spain do not know how to use email and up to 30% cannot make video calls over the internet and 25% do not have the skills to manage their personal data or cookies, which is a real labour problem, both from the perspective of the company and from that of each individual worker. But it is even more affected, 26% of employees attribute the increase in stress at work to technology-related issues.

Looking at the results, it's clear that there are a number of activities that could help address the digital and soft skills gaps among workers aged 50+ in Spain being training one of them **(only 23,4% of responders has received a comprehensive and sufficient training – Annex 1).**

For knowing how to change the situation, we have a look at the Continuous Improvement and Learning (Annex 5) and the Motivation and Training Needs (Annex 6) results. One of the main aspects it that **28,1% of responders are either "Never" or "Rarely" participate in continuous improvement initiatives**, that includes trainings and courses. And the **39,1% indicate quite difficult to deal with changes and uncertainty** or neither easy nor difficult to deal them. If we add the indicated distressing aspects of using digital technologies for office use (**afraid to make mistakes 39,1% and others 45,3%** - cybersecurity, staying up to date, no training, no system updates, Misuse) digital trainings can be seen as a negative challenge for aging workers, as we have seen above.

To break this barrier, **the biggest motivators for our responders to learn digital skills are the interest in new technologies 51.6% and higher salary 18.8**% which can be used as a technique for linking training with the positive aspect considered by them. However, 10,9% of the responders have no motivation to learn new technologies which represents a blockage towards the positive aspect of training.

Motivation for training also depends on the type of. Our responders emphasize **practical examples 33,1% as the most effective** one. Rather than hypothetical scenarios, practical examples give students the opportunity to apply what they've learned in a real-life setting. This application helps to cement knowledge and make it more durable. Practical learning allows students to learn quick adaptations needed and scenarios and allows students to get a better understanding of training topic and practice in advance. Using them, mistakes are allowed and they are used to reflect, regroup, and begin to use the new-found knowledge with trust. **Online video tutorials/training 29,9% and onsite training 24,4% have been chosen as an equivalent venue where to receive the training.** Taking into a consideration the stress on practical examples, in both cases they can be used and areas like office software, cybersecurity, data tools and management procedures can be taught without no problems.

Furthermore, offering practical workshops to improve softs skills **(communication, stress management, constructive feedback and relationships)** in which aging workforce can improve teamwork and rapport, empathetic capacity, copying strategies, enhanced problem solving, emotional intelligence, active listening, etc., help them both personally and professionally. It not only helps aging workforce advance or keep updated in their careers, but also plays an essential role in helping companies succeed.

Acquiring or improving digital skills can enhance aging workforce employability and career prospects. In an increasingly technology-driven job market, having strong digital competencies can set individuals apart from their peers and open doors to new opportunities.

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In brief, offering digital training and soft skills workshops can be the solution for ending with the digital illiteracy, digital divide or low digital skills which reduce the chances of finding work or accessing quality employment to the aging workforce and which has a negative impact on their economy.

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7. Needs Analysis Country Report – Türkiye

7.1.Methodology

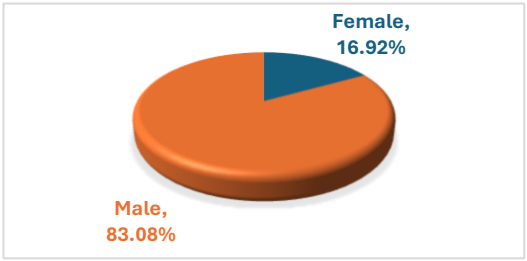
Description of the Data Collection

The survey was conducted in Kütahya, Türkiye, following the approval from the university's ethics committee. The survey was translated into Turkish in a clear and comprehensible manner and subsequently transferred to Google Forms. This approach aimed to facilitate the survey process, enhance practicality, and minimize paper waste, aligning with one of the objectives of the Erasmus+ Programme.

As part of the survey distribution, informational notes and clarifications related to the project were shared with local and regional institutions, both public and private. The survey link was disseminated to university staff, the Directorate of National Education, and the City Finance Directorate. Additionally, the project's researchers visited several local and regional private institutions to conduct the survey in person. The survey administration took place during the first three weeks of September 2024. Survey links and reminders were regularly sent to participants, supplemented by occasional phone calls and in-person meetings to ensure participation.

A total of 72 individuals initially participated in the research. However, seven survey responses were excluded due to participants being under the age of 50, resulting in 65 valid survey responses. Among the respondents, 54 were male and 11 were female, corresponding to 83.08% male and 16.92% female participants.

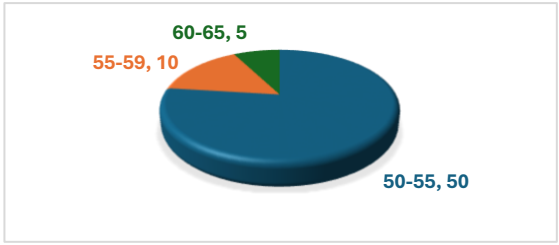
Figure 7.1. Gender



Source: Author's own, based on data from the questionnaire

Regarding the age distribution of the participants, 50 individuals, representing 76.92% of the sample, were aged between 50 and 55 years. Ten participants, equivalent to 15.38%, were between 55 and 59 years old, while 5 participants, accounting for 7.69%, were between 60 and 65 years old.

Figure 7.2. Age group



Source: Author's own, based on data from the questionnaire

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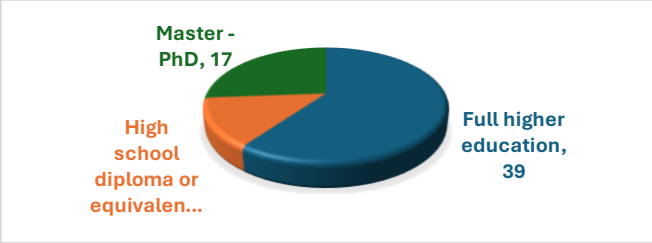
The educational attainment of the participants is as follows: 60.00% hold a full higher education degree, 26.15% have attained a Master's or PhD degree, and 13.85% possess a high school diploma or its equivalent.

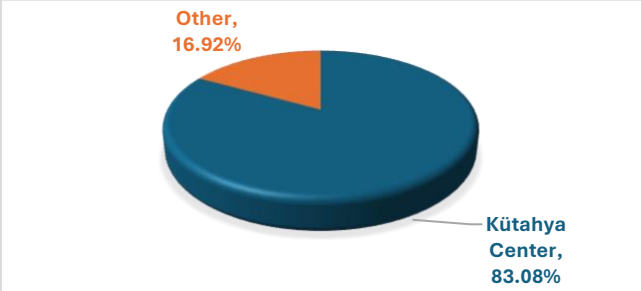
Figure 7.3. Education



Source: Author's own, based on data from the questionnaire

Out of the participants, 54 reside in the central area of Kütahya, while 11 reside in other districts.

Figure 7.4. Distribution of Respondents by Place of Residence



Source: Author's own, based on data from the questionnaire

Table 7.1. Gender – Age – Education Info Table

Gender – Age – Education Info Table	**Numbers**
Female	**11**
50-55	10
Full higher education	6
Master - PhD	4
55-59	1
Full higher education	1
Male	**54**
50-55	40
Full higher education	24
High school diploma or equivalent	6
Master - PhD	10
55-59	9
Full higher education	5
High school diploma or equivalent	1
Master - PhD	3
60-65	5
Full higher education	3

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High school diploma or equivalent	2
Total	**65**

Source: Author's own, based on data from the questionnaire

7.2.Analytical Approach

This quantitative study employed descriptive analysis to examine the collected data. Data were gathered through a survey technique, followed by statistical analysis and data visualization. A 5-point Likert scale was used for certain survey questions, and the distribution of responses is presented through descriptive statistics, including graphs and tables. The findings are organized around themes related to digital skills needs and soft skills needs, following an overview of the participants' sociodemographic characteristics. The scope of this study is limited to individuals aged 50 and above residing in Kütahya and its surrounding areas.

Reaching the older segment of the workforce, particularly those needing digital skills, posed challenges. A significant factor was the EYT regulation in Türkiye, which facilitates early retirement, leading many individuals to retire at an age not typically classified as elderly. Among the remaining elderly workforce, it was challenging to find individuals with adequate digital competencies and familiarity with digital terminology. Consequently, some participants experienced difficulty comprehending certain survey question options.

7.3.Findings - Digital Skills Needs

7.3.1. Current competence levels:

When evaluating the responses regarding participants' readiness to use new digital tools, it was evident that more than half of the participants expressed a positive attitude. Specifically, 38 participants reported feeling "very comfortable," while 14 participants indicated they were "comfortable" with using new digital tools.

Table 7.2. Respondents' Comfort Level with Using New Digital Tools in Their Work

	Number	**Percentage**
Very Uncomfortable	2	3,08%
Uncomfortable	1	1,54%
Neutral	10	15,38%
Comfortable	**38**	**58,46%**
Very Comfortable	**14**	**21,54%**
Total	**65**	**100,00%**

Source: Author's own, based on data from the questionnaire

It was also observed that participants who remain employed at an institution possess the ability to utilize digital tools in their daily work activities. In response to the question regarding the frequency of their use of digital tools at work, 48 participants indicated regular usage, with 33 reporting that they use digital tools "often" and 15 stating they use them "very often."

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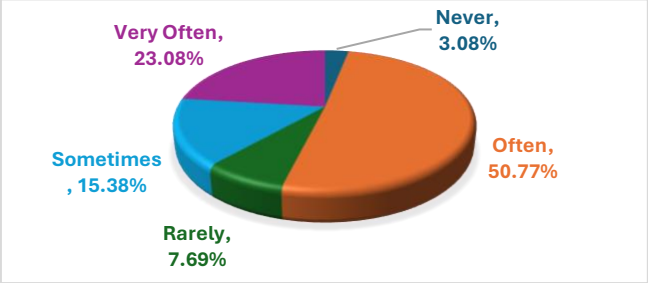
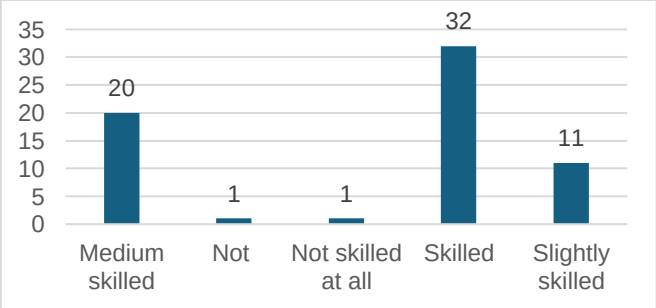
Figure 7.5. Frequency of Software and Digital Tool Usage in Work Among Respondents



Source: Author's own, based on data from the questionnaire

Regarding the participants' basic skills in managing digital files, 32 participants (49.23%) identified themselves as "skilled," while 20 participants (30.77%) described their skills as "medium." Together, these groups constitute more than half of the participants

Figure 7.6. Respondents' Self-Assessment of Digital File Management Skills



Source: Author's own, based on data from the questionnaire

In terms of cybersecurity, the participants demonstrated a degree of familiarity, with 8 individuals describing themselves as "very familiar" and 37 as "somewhat familiar" with cybersecurity concepts.

Table 7.3. Respondents' Familiarity with the Concept of Cybersecurity

	Number	Percentage
Neither familiar not unfamiliar	5	7,69%
Not familiar at all	4	6,15%
Not very familiar	11	16,92%
Somewhat familiar	**37**	**56,92%**
Very familiar	8	12,31%
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

As part of cybersecurity practices, the proportion of participants who use two-factor authentication "often" or "always" is only 3% higher than those who use it "rarely" or "never."

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This indicates a relatively balanced distribution between frequent users and those who seldom or never adopt this security measure.

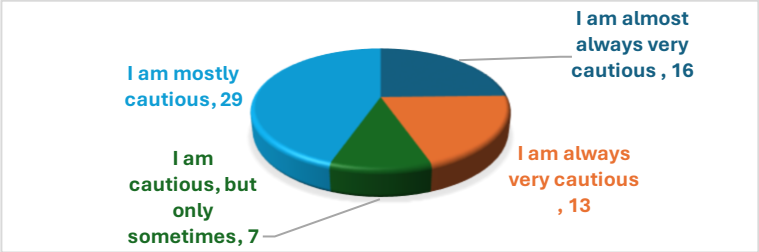
Table 7.4. Frequency of Using Two-Factor Authentication (2FA) for Online Accounts

	Number	Percentage
Never	12	18,46%
Rarely	12	18,46%
Sometimes	15	23,08%
Often	**17**	**26,15%**
Always	**9**	**13,85%**
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

Regarding the practice of opening emails from unknown senders, most participants demonstrated a cautious approach. Specifically, 13 participants reported being "always" cautious, 16 indicated they are "almost always" cautious, and 29 described themselves as "mostly" cautious in such situations.

Figure 7.7. Respondents' Caution Levels When Interacting with Emails or Links from Unknown Senders



Source: Author's own, based on data from the questionnaire

The majority of participants (39) do not exhibit any preconceived notions against learning new technological tools and express confidence in their abilities to adapt to such tools.

Table 7.5. Frequency of Respondents' Confidence in Learning and Using New Digital Tools and Technologies

	Number	Percentage
Never	2	3,08%
Rarely	6	9,23%
Sometimes	18	27,69%
Often	**28**	**43,08%**
Always	**11**	**16,92%**
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

Regarding participants' competence levels in using office software, while a significant number (21) find it neither easy nor difficult, a total of 33 participants reported proficiency, either excelling in the use of such software or using it effectively.

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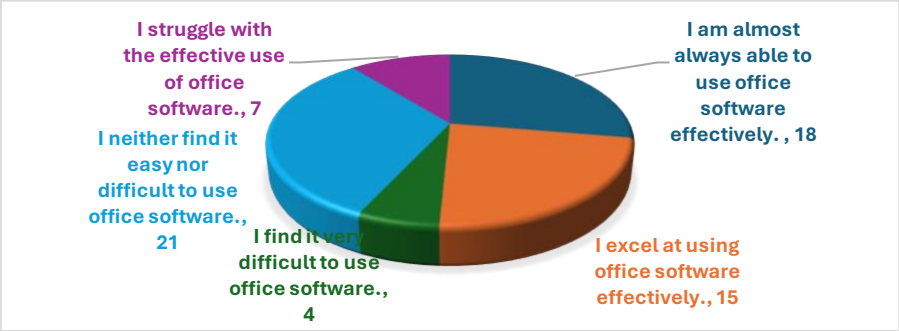
Figure 7.8. Respondents' Self-Rated Competence in Using Office Software (e.g., MS Office, Google Workspace)



Source: Author's own, based on data from the questionnaire

In terms of managing, organizing, and filtering emails, as well as utilizing advanced email features, 26 participants reported that they are able to manage emails effectively, while 7 participants indicated they excel in this area. Conversely, 11 participants acknowledged having difficulty with these tasks.

Table 7.6. Respondents' Comfort Level with Managing Emails and Using Advanced Email Features

	Number	Percentage
I find it very difficult to manage emails effectively.	3	4,62%
I struggle to manage emails effectively.	8	12,31%
I neither find it easy nor difficult to manage emails.	21	32,31%
I am able to manage emails effectively.	**26**	**40,00%**
I excel at managing emails effectively.	**7**	**10,77%**
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

In summary, the findings indicate that a majority of the participants (52) feel comfortable using new digital tools, with 38 participants (58.46%) describing themselves as "comfortable" and 14 participants (21.54%) as "very comfortable." These figures suggest that participants integrate new technologies into their work routines without preconceived reservations.

Another significant statistic is that most participants (48) utilize technological tools and software daily in their work environments, with 33 participants (50.77%) using them "often" and 15 participants (23.08%) using them "very often."

Regarding skill levels, 32 participants (49.23%) identified themselves as "skilled," while 20 participants (30.77%) described their skills as "medium." Interestingly, only one participant rated themselves as "very skilled," indicating a general tendency among participants to be modest about their digital competencies. This aligns with their medium familiarity with cybersecurity concepts, as 37 participants (56.92%) identified themselves as "somewhat familiar."

In terms of cybersecurity practices, just slightly over half of the participants (by a margin of 3%) reported using two-factor authentication, suggesting that further training could

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enhance their effective use of this security measure. Moreover, a substantial number of participants (58) exercise caution when handling emails from unknown senders, avoiding potentially risky interactions.

As for skills in using office software, 33 participants (50.77%) reported proficiency, while a similar number of participants demonstrated competence in managing email-related tasks. This suggests a solid foundational skill set in essential office and communication tools among the study's participants.

7.3.2. Identify key digital skills gaps

Despite the evident need for digital tools in daily work life, only 12 participants indicated that they had received comprehensive and adequate training in using these tools. This finding highlights a deficiency within institutions regarding the provision of training for the effective utilization of digital applications and software.

Table 7.7. Proportion of Respondents Who Have Received Training on Digital Tools in Their Current Workplace

	Number	Percentage
No training	**22**	**33,85%**
Minimal training	**11**	**16,92%**
Some training, but not sufficient	**20**	**30,77%**
Comprehensive and sufficient training	12	18,46%
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

Regarding the use of video conferencing tools, participants generally reported moderate or lower levels of proficiency. This suggests a potential need for training, as some participants may lack the knowledge required to use these tools effectively. Enhanced training could improve their ability to leverage video conferencing for increased efficiency and better time management in their work.

Table 7.8. Frequency of Video Conferencing Tool Usage Among Respondents

	Number	Percentage
I don't use them at all	**12**	**18,46%**
I rarely use them	**15**	**23,08%**
I sometimes use them	**23**	**35,38%**
I regularly use them	8	12,31%
I use them very often	7	10,77%
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

Similar to the reported usage levels of video conferencing tools, the proficiency in using cloud-based services among participants is generally moderate or lower. Only 16 participants indicated that they use these services "often" or "very often," suggesting that the majority may lack familiarity or comfort with cloud-based tools, potentially limiting their integration into daily work routines.

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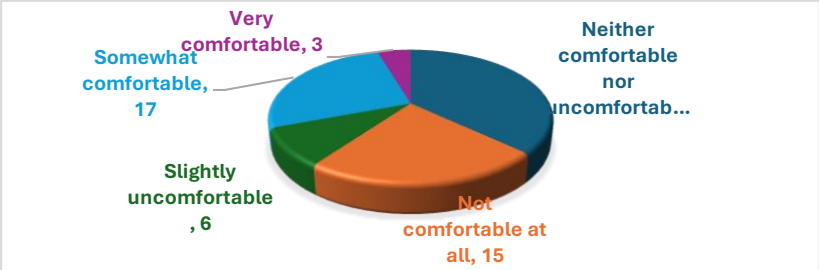
Table 7.9. Frequency of Cloud-Based Services Usage Among Respondents

	Number	Percentage
Never	21	32,31%
Rarely	15	23,08%
Sometimes	13	20,00%
Often	10	15,38%
Very often	**6**	**9,23%**
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

Regarding participants' comfort levels with storing personal data in cloud systems, only 9 participants reported feeling "very comfortable" or "slightly comfortable." This suggests a general lack of trust in the digital environment among the participants or a lack of knowledge regarding secure usage practices for cloud storage.

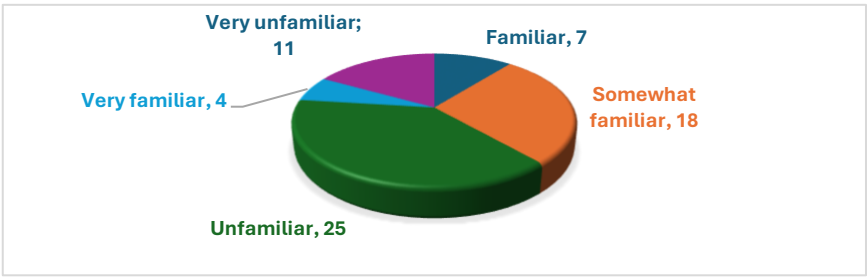
Figure 7.9. Respondents' Comfort Level with Personal Data Being Stored on Cloud Servers



Source: Author's own, based on data from the questionnaire

In terms of using Artificial Intelligence (AI) in the workplace, only 11 participants reported being "familiar" or "very familiar" with these technologies. This finding suggests that the 50+ age group may be struggling to keep up with the latest advancements and trends in AI, indicating a potential need for targeted training and support to bridge this knowledge gap.

Figure 7.10. Respondents' Familiarity with Generative AI and Its Workplace Applications



Source: Author's own, based on data from the questionnaire

In the area of data analysis and visualization, 23 participants reported having moderate skills, while 15 participants indicated limited skills, and 10 participants stated that they are

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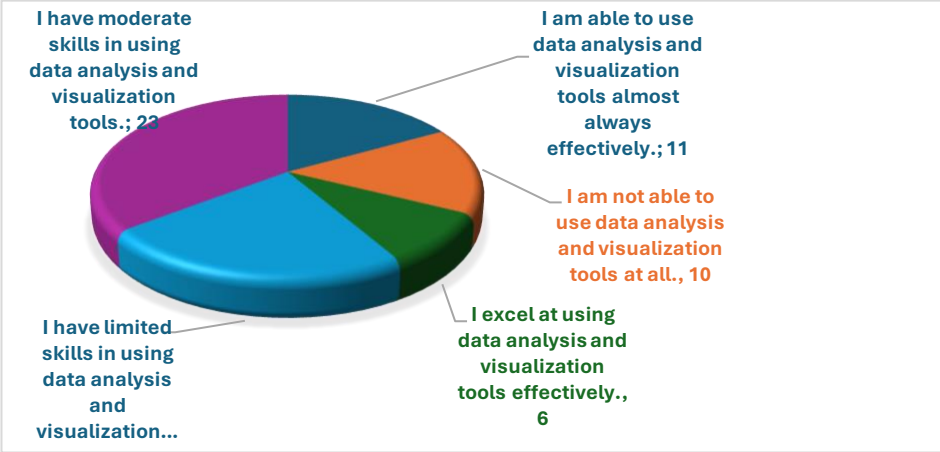
unable to use these tools. These results clearly demonstrate that the majority of participants possess relatively low proficiency in data analysis and visualization, highlighting a potential need for further training and skill development in this area.

Figure 7.11. Respondents' Self-Assessment of Skills in Data Analysis and Visualization Tools



Source: Author's own, based on data from the questionnaire

To identify the primary cause of the digital skills gap, it is essential to examine the digital training background of the participants. Only 18.46% of the participants (12 individuals) reported having received formal digital training. This suggests that most participants have acquired digital skills through self-learning or peer learning. Interestingly, despite the lack of formal training, many participants feel comfortable using new technologies, indicating a strong potential for further learning if effective training opportunities were provided.

Additionally, most participants use video conferencing tools infrequently, with 50 participants (76.93%) reporting that they use these tools "rarely" or "sometimes." This limited usage could hinder their ability to optimize time and efficiency in their work. Similarly, cloud-based systems, which facilitate practical and easy data storage and sharing, are used "often" or "very often" by only 16 participants (24.61%). This suggests that traditional methods of data storage and sharing remain prevalent. Furthermore, only 3 participants (4.62%) feel very comfortable storing data on cloud servers, a hesitation likely linked to the lack of a solid digital training foundation.

Data analysis and visualization, essential tools in modern office environments, present another challenge. While 23 participants possess moderate skills in these areas, 26 participants struggle with them. This highlights a gap in essential digital competencies. Moreover, in keeping with recent technological trends, it is evident that individuals aged 50+ face difficulties adapting to innovations in Artificial Intelligence (AI). Only 11 participants (16.92%) reported familiarity with AI, indicating a significant digital gap between this age group and current technological trends, which could potentially slow down their work processes and reduce efficiency.

Although the majority of participants (60%) express confidence in using new digital technologies, and many show interest in adopting new technologies in the workplace (49.23%), there remains a noticeable hesitation or barrier toward embracing AI. Addressing this challenge would require institutions to integrate these new trends into their work culture and provide targeted training to help staff adapt to emerging technologies effectively.

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7.4.Implications for Labour Market Outcomes:

The overall results of the survey analysis reveal that the most critical issue concerning the digitalization and digital skills of individuals aged 50+ is the lack of sufficient digital training. It is evident that employees tend to acquire digital competencies through self-learning or peer support. To address this gap, especially in public institutions—where digitalization and training efforts lag behind those of private institutions in Türkiye—regular training sessions should be implemented during work hours. This approach can help encourage employees to participate willingly in such programs.

To minimize time loss and avoid overcrowding of meeting rooms, the labour market should establish suitable conditions for the use of online video conferencing tools, which can enhance work efficiency and improve employee performance. Additionally, to facilitate data management and prevent data loss, as well as to simplify data sharing, it is essential to provide training and support for the use of cloud-sharing tools.

To keep pace with recent developments and achieve more effective work outcomes, the labour market must focus on educating and updating employees on matters related to Artificial Intelligence (AI). This approach would enable institutions to leverage the valuable experience of the 50+ workforce alongside the advantages offered by AI-driven technologies.

Furthermore, the labour market should initiate security certification programs, incorporating training modules on cybersecurity and two-factor authentication, as these areas have been identified as significant gaps in the survey results. To strengthen employees' soft skills and ensure their practical application, institutions should also organize training sessions on management processes, a deficiency highlighted in Q24.

Lastly, it is clear that many employees feel apprehensive about making mistakes when using digital office technologies, underscoring the need for in-service digital training programs. These trainings would not only enhance their confidence but also ensure a more proficient and digitally skilled workforce.

In addition, the survey results indicate that employees in workplaces in Türkiye are not consistently involved in continuous improvement initiatives. Specifically, 16.92% of participants reported "never" being involved, 30.77% indicated "sometimes," and 21.54% stated "rarely." Moreover, most participants are not familiar with the concept of continuous improvement. Similar to the need for in-service digital training, institutions should address this gap by taking proactive measures to integrate employees into continuous improvement processes.

Table 7.10. How familiar are you with the concept of 'continuous improvement' in a workplace setting?

How familiar are you with the concept of 'continuous improvement' in a workplace setting?	
Not familiar at all.	35,38%
Somewhat familiar, but I do not apply it much.	46,15%
Very familiar and I apply it regularly.	18,46%
Total	100,00%

Source: Author's own, based on data from the questionnaire

The elderly population in Türkiye totals 8,722,806, accounting for 10.2% of the country's overall population. In 2023, 44.5% of this elderly population were male, while 55.5% were female.

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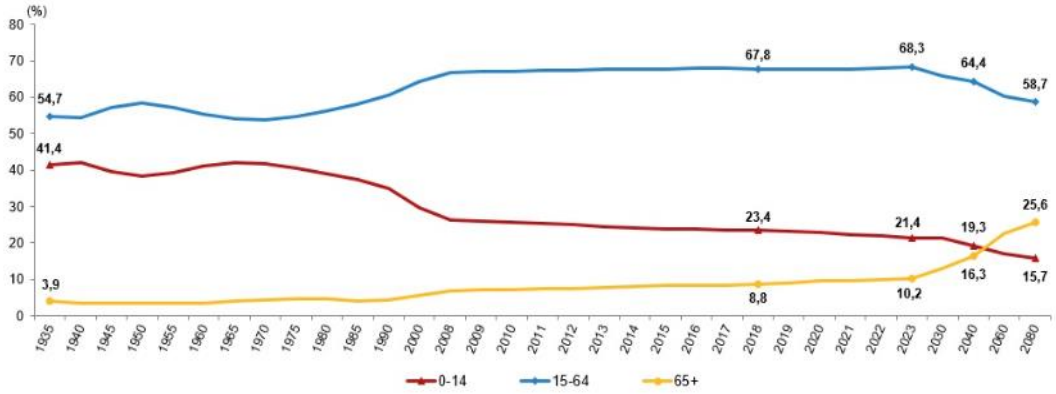
Figure 7.12 The elderly population in Türkiye



Source: TURKSTAT (Turkish Statistical Institute)

According to population projections, the proportion of the elderly population in Türkiye is expected to increase to 12.9% by 2030, 16.3% by 2040, 22.6% by 2060, and 25.6% by 2080. In 2022, the breakdown of the elderly population by educational attainment was as follows: 46.6% were primary school graduates, 9.1% had completed secondary or equivalent education, 9.1% were high school or equivalent school graduates, and 8.3% had attained higher education. A significant disparity exists between genders in terms of educational attainment, with elderly males having higher educational levels across all categories compared to elderly females.
Labor force statistics reveal that in 2023, the labor force participation rate among the elderly population was 12.2%, with a gender breakdown of 20.0% for elderly males and 6.1% for elderly females. The unemployment rate in the elderly population was 3.1% in 2019 and decreased to 2.7% in 2023. Sectoral employment distribution in 2023 showed that 57.7% of employed elderly individuals worked in agriculture, 32.1% in services, 7.3% in industry, and 2.8% in construction.

Data from the household information technology usage survey indicate a significant increase in internet use among individuals aged 65-74, from 17.0% in 2018 to 40.7% in 2023. When examining internet use by gender, it was observed that elderly men were more likely to use the internet than their female counterparts—49.8% of elderly men used the internet in 2023, compared to 32.7% of elderly women.

According to the findings of our study, a key issue is the insufficient focus on digital skills training in workplaces, particularly training that enhances the ability to use artificial intelligence. Individuals over the age of 50 often express concerns about digital security and struggle to integrate artificial intelligence into their professional activities. Addressing these training gaps could help improve digital competency among this age group, allowing them to better leverage technological advancements in their work.

7.5.Findings - Soft Skills Needs

7.5.1. Current Competency Levels

When participants were asked about their skills in effective communication and active listening, 29 participants (44.62%) rated their skills as "good," 22 participants (33.85%) rated them as "average," and 11 participants (16.92%) considered their skills "excellent." Only 3 participants (4.62%) described their skills as "poor" or "very poor." This indicates that the

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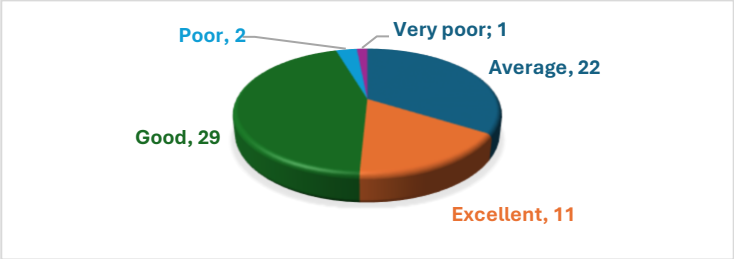
majority of participants perceive themselves as having at least moderate proficiency in these soft skills.

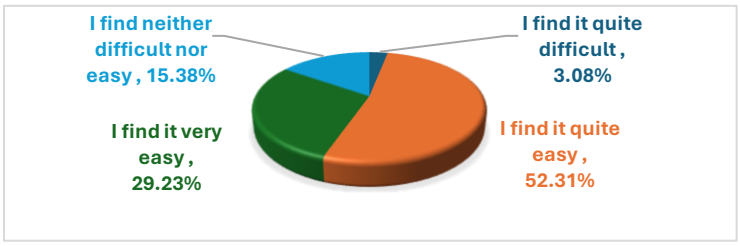
Figure 7.13 Respondents' Self-Rating of Effective Communication and Active Listening Skills



Source: Author's own, based on data from the questionnaire

Regarding the ability to build good communication and trust with team members at work, the majority of participants provided positive responses. Specifically, 34 participants (52.31%) stated that building communication and trust is "quite easy," and 19 participants (29.23%) described it as "very easy." Meanwhile, 10 participants (15.38%) found it "neither difficult nor easy." Only 2 participants (3.08%) considered it to be "quite difficult." This suggests that most participants find it relatively straightforward to establish effective communication and trust within their teams.

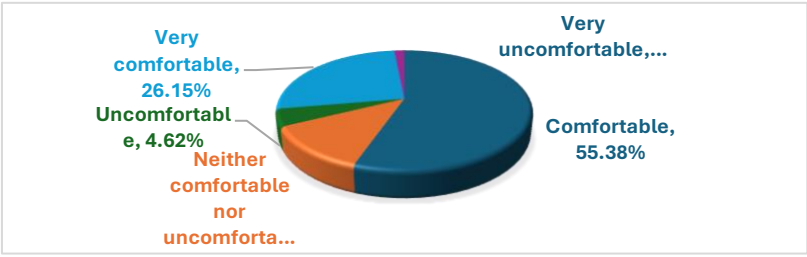
Figure 7.14 Respondents' Ability to Build Trust and Good Relationships with Co-Workers/Team Members



Source: Author's own, based on data from the questionnaire

Regarding the ability to provide constructive feedback in the workplace, the majority of participants reported feeling "comfortable" (36 participants) or "very comfortable" (17 participants), making up a total of 81.53%. This high percentage suggests that a positive atmosphere exists within these workplaces, where employees feel at ease offering feedback to one another.

Figure 7.15 Respondents' Comfort Level with Providing Constructive Feedback in the Workplace



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Source: Author's own, based on data from the questionnaire

In terms of receiving constructive feedback in the workplace, the responses are similar to those regarding providing feedback. Specifically, 35 participants reported feeling "comfortable," and 15 participants indicated they are "very comfortable" with receiving feedback. Only 4 participants described themselves as "uncomfortable" or "very uncomfortable." This suggests a generally open and receptive environment for feedback among most participants.

Table 7.11. Respondents' Comfort Level with Receiving Constructive Feedback in the Workplace

	Number	Percentage
Very uncomfortable	1	1,54%
Uncomfortable	3	4,62%
Neither comfortable nor uncomfortable	11	16,92%
Comfortable	35	53,85%
Very comfortable	15	23,08%
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

In evaluating the soft skills of individuals aged 50 and above, communication skills emerged as a key criterion. A total of 40 participants (61.54%) rated their communication skills as "good" or "excellent." Additionally, 53 participants (81.54%) indicated their ability to build trust and establish strong relationships with their peers, suggesting that the 50+ generation possesses significant potential for fostering positive workplace relationships and acting as trustworthy and friendly colleagues.

Moreover, 53 participants (81.53%) reported feeling "very comfortable" or "comfortable" when providing constructive feedback to others in the workplace. Similarly, 50 participants stated that they are comfortable with receiving feedback from their peers, highlighting a crucial aspect of healthy communication within the workplace.

Regarding their ability to handle changes and uncertainties at work (Q30), while 28 participants (43.08%) found it "neither difficult nor easy," 23 participants (36.93%) reported that they found it "easy" or "relatively easy" to adapt to these challenges. This indicates a notable adaptability among the participants when facing change in their work environment.

7.6.Key Soft Skills Gaps

Regarding knowledge of management processes, it is evident that the participants lack sufficient familiarity with these concepts. Only 3 participants reported being knowledgeable about all the management processes surveyed. In contrast, 35 participants indicated that they were unfamiliar with any of the processes. Among the remaining participants, 27 demonstrated partial knowledge: 17 participants were familiar only with Kaizen, 5 knew only Total Quality Management, 3 were aware only of Kanban, and 2 had knowledge of both Kaizen and Total Quality Management. This highlights a significant gap in understanding management methodologies among the participants.

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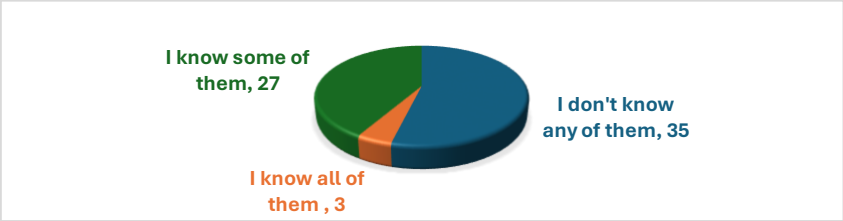
Figure 7.16 Respondents' Knowledge of Management Processes: Kanban, Kaizen, Total Quality Management, and Just-in-Time



Source: Author's own, based on data from the questionnaire

In response to a question concerning their ability to manage stress and uncertainty in the workplace—an important criterion—only 20 participants indicated a high level of effectiveness (18 as "quite effective" and 2 as "very effective"). The majority of participants, 33 in total, rated themselves as "somewhat effective," representing 50.77% of the participants. This suggests that while a portion of the group has developed strong stress management skills, most participants recognize room for improvement in handling workplace stress and uncertainty.

Table 7.12. Respondents' Effectiveness in Managing Stress and Uncertainty Related to Workplace Digitalization

	Number	Percentage
Not at all effectively	3	4,62%
Hardly ever effective	9	13,85%
Somewhat effective	33	50,77%
Quite effective	18	27,69%
Very effectively	2	3,08%
Total	65	100,00%

Source: Author's own, based on data from the questionnaire

In identifying gaps in key soft skills, it appears that while participants are adept at the practical application of these skills, they lack a foundation in theoretical, professional, and contemporary management processes. The survey revealed that 35 participants (53.85%) are unfamiliar with management processes such as Kanban, Kaizen, Total Quality Management, and Just-in-Time. Only 3 participants (4.62%) reported knowledge of all these processes. Additionally, 28 participants (43.08%) expressed uncertainty about handling changes in the workplace (Q30), which, while indirectly related to soft skills, suggests that nearly half of the participants have preconceived reservations or face challenges when adapting to new situations, including digital transformations.

7.7.Conclusions and Recommendations

In the survey evaluation, 65 participants' responses were considered valid, with a demographic composition of 54 males (83.08%) and 11 females (16.92%). The majority of participants were aged between 50 and 55 (50 participants, 76.92%), reflecting a typical demographic for working-age groups within institutions, particularly among individuals over 50.

Regarding digital competency, 80% of participants expressed comfort with using new digital tools, and similarly, 80% reported frequent use of digital applications. This underscores the importance of digital technologies in their professional lives, a trend observed across Türkiye over the past 15 years. Digital applications have become integral to daily operations,

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requiring individuals to adapt to digital processes regardless of age. In the domain of cybersecurity, 69% of participants are aware of basic concepts, while 40% use two-factor authentication. However, the data suggests minimal differences between those who are familiar with and those who regularly implement these security measures. A majority of participants are proficient in essential digital skills, such as managing email (50.77%) and using office software (51%).

Despite these competencies, findings highlight that 51% of participants lack a formal digital training background, while 30.77% consider their training insufficient. This gap is particularly evident in many institutions—especially public ones—where digital training is often undervalued, and staff members are directed to watch standardized training videos, which are not always effective. As a result, many participants do not utilize online video conferencing systems (40% never or rarely, 35% sometimes) or cloud-based storage solutions effectively (55%). Additionally, 55.38% of participants are unfamiliar with artificial intelligence (AI), which could hinder their ability to meet future workplace demands. Addressing this gap requires targeted training programs to enhance digital competencies, especially for experienced workers aged 50 and above.

Concerning soft skills, 53.85% of participants are unfamiliar with professional management processes, potentially due to a lack of workplace training opportunities, especially in public institutions. Moreover, 43.08% of participants are uncertain about their adaptability to new situations, which may stem from resistance to change in workplace hierarchies in Türkiye. Improving this aspect requires knowledge-sharing activities, psychological support, and fostering a work environment free from pressure. It is crucial to communicate to employees that, despite initial time investment, such training can ultimately improve efficiency and team collaboration.

To remain competitive, both institutions and employees must advance their digital competencies. A 2013 study in a state institution in Türkiye, utilizing the "TPACK Deep Scale" by Kabakçı Yurdakul (2012), examined the techno-pedagogical skills of 132 instructors. The study found that technological competency was not significantly influenced by gender or academic rank, but age was a key factor. Educators aged 31-40 adapted to new technologies more readily than those over 50, indicating that older educators may face greater challenges in integrating technology into their work. Enhancing digital skills among older employees is therefore essential to maintaining a capable and experienced workforce.

Overall, the survey results indicate that while participants generally understand digital concepts, there are gaps in applying these skills in practice. Although they demonstrate satisfactory proficiency in using basic office programs and possess strong social and communication skills, a structured approach to further training is needed. Additionally, the findings underscore the importance of training in areas such as cybersecurity, cloud computing, business management principles, and AI. To ensure effectiveness, it is also important to provide trainers with foundational knowledge in these topics, enabling them to deliver more impactful training sessions.

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8. Conclusions

The fast development of the labor market due to technological progress puts older workers aged over 50 in a peculiar position. In the process of industries being digitized and automated and the universal skills take predominance; there is a need for universal skills in the digital and soft domain. This need was explored as part of the needs analysis carried out by the Enhancing Digital and Soft Skills for Ageing Workforce (EDSAW) project team to assess existing capacities and specific difficulties of older workers in Slovakia with special emphasis on their preparedness to meet the requirements of today's working environment. This report presented the main results of the analysis on digital and soft skills, and the role of specific training programs for older workers. These results clearly demonstrate the very urgent need for strategic interventions in reskilling and upskilling members of this demographic group to make them even more attractive and valuable in the evolving digital labor market.

The study reveals substantial gaps in digital and soft skills among employees over 50, particularly in Slovakia. Thus, it raises important questions about the trade-off between individual employability and the broader economic dependence of the global economy on a technologically adept workforce. This is particularly salient in the case of Slovakia because the developments associated with aging and changing demographics have led to added strain on the country's labor market. In the view of the fast pace at which industries across the globe have been digitizing, the need for digital skills among older workers is evident. Nowadays, given new technologies like AI, automation, cloud computing, and big data analytics, being digitally literate cannot merely be considered as an asset, but as a prerequisite. The report points out that the majority of older workers lack even some of the basic office software, digital file management, and cloud service operation skills that would support their productivity. More importantly, the lack of these skills curbs organizations' general potential in meeting new market demands. Soft skills such as communication, flexibility, and leadership are necessary at the time, when routine tasks are under immense pressure to be completed by automation. But, the demand for human ability to create, solve-problems, and interact has increased. The report identifies problems that many older workers have, especially with integrating into the modern, team-based work settings. Many employees do not feel comfortable since, for example, giving and taking constructive feedback is very difficult for most of them. Therefore, in the absence of these skills, it becomes very difficult to fit them into collaborative, cross-functional teams.

The gaps in digital and soft skills form a sort of a dual-barrier for older workers. The former limit their capacity to use tools and technologies required for work in a modern workplace. On the other side, difficulties in acquiring soft skills (such as conflict resolution, leadership, or effective communication skills) make it difficult for them to collaborate, innovate, and provide team leadership in a dynamic environment. Hence, this dual-barrier situation makes it very hard for older workers to transition into a role that demands technical skills and interpersonal effectiveness. For example, the report points out that most older workers are less familiar with cloud-based services and digital collaboration tools, which were indispensable during the COVID-19 pandemic and in the post-pandemic era they play a central role in many business operations. Workers may struggle to keep up with such tools as Microsoft Teams, Zoom, or project management software, which are indispensable in a remote or hybrid working environment. A large majority of them were uncomfortable with the complete acceptance of remote work that demands heavy digital communication and working on file sharing on the cloud. Workers who had never been exposed to any of this technology or corresponding roles were sometimes left out of important workplace activities or made to feel

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that way. New generation of employees are more tech-savvy and adapt easily to new technology and platforms, while older employees may be hesitant or uncomfortable with these tools. This generational "digital divide" created added pressure on aging workers to be able to keep up with the fast-paced technological aspects of their work.

One of the major challenges for older employees is cybersecurity. The digitization being carried out by organizations propels the need for proper cybersecurity operations. But many older workers do not even understand that there exist phishing attacks, that they should set strong passwords, or that they should enable two-factor authentication. Such employees become an easy target for hackers. This practice not only threatens their personal data but also the data security of their respective organizations.

The problem of skill gaps among older workers is an issue that has also wider socioeconomic impacts. In the context of a global aging workforce, it is an imperative to keep older citizens working and contributing to the economy. Failure to seriously address these skill deficits will have long-term consequences. An under-skilled older workforce contributes to high rates of unemployment, low productivity, and a high dependency ratio on the country's social welfare systems. Such employees are also more likely to be excluded from the labor force, given that the 'job for life' culture has been gone and workers have to switch roles, sectors, and sometimes industries throughout their working lives. Contributing further to the problem is the fact that older workers are often subject to age discrimination. Recruiting firms can regard them as immovable and too expensive, not favoured for promotion due to their digital and soft skill gaps.

To effectively close these gaps, interventions must be tailored explicitly for older workforce. Ongoing training has been supported by very few organizations, so employees, specifically older ones, are left further behind as these technology tools continue to grow. Therefore, generic training programs are not well suited for this population group because they do not address the unique challenges that they face in new skill acquisition. There is the evidence that older people learn differently than the younger population; they may need more time, repetitions, or a practical/hands-on orientation to be comfortable with new digital tools. They also may have psychological barriers related to fear of making errors or believing that they are too 'set in their ways' to absorb any new technology. These can be gradually cleared in the conducive learning environments. Programs that incorporate technical training along with soft skill development are likely to have a better impact on employability and productivity. However, focused efforts are needed to develop customized, all-inclusive training programs for the older workers to equip them with the required digital as well as soft skills needed so that they can use the experience and wisdom and continue to remain active in a fast-growing digital economy.

In a wider context, beyond elementary digital literacy and cybersecurity, the adoption of recently developed technologies like artificial intelligence and machine learning that are reshaping industries by automating routine functions and providing data-centric input for better efficiency and decision-making is needed. In this respect, the new AI tools also often remain out of reach for older workers, who otherwise have little knowledge of how these tools can be used within their working environment. A report discloses that many older workers are not acquainted with artificial intelligence and also lack confidence in being able to learn and adapt to these advanced technologies. That can turn into critical problem when the sector is one of those, where artificial intelligence has become part of day-to-day operations, as workers without the ability to work with such tools may find themselves severely handicapped. In the accelerating pace of technological progress, many older employees feel that they are perpetually

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only catching up with technology, and the rate at which these changes happen is quite intimidating for them.

Moreover, many older workers may not be able to manage the acquisition of new skills along with their current responsibilities, which implicates the risk of their skill stagnation and decrease in their employability. Another important factor that came out from the survey is that many organizations do not offer structured digital training. The report findings point out that quite a substantial share of older workers does not receive sufficient training on digital tools and technologies. The absence of the focus on upskilling and reskilling through structured training programs places even more pressure on older employees to learn to maneuver in the digital world. Most of the time, when this training is done, it only caters to the most general-level courses and does not capture the interest of older adults who want to dip deeper into the new technologies.

But due to factors mentioned above, many older workers can shy away from the use of new technologies or attending training programs, which can further widen their skill gap. The stakes of this challenge in the digital transformation are quite high. Older employees that fail to keep track with the technological wave may experience job loss or get shifted to positions that are not aligned with their experience and competences. On the other hand, companies face the situation, when older employees are less efficient, which can lead to decreased productivity and innovation. Those companies which do not invest in reskilling of their employees may create a persisting split between the digitally skilled and digitally left-out employees.

These challenges must be addressed by the efforts of both organizations and policymakers. Employers should provide tailor-made digital training programs specifically focused on the older workers' requirements. Such programs should ensure a friendly learning environment and train them in digitization without fear, apprehension, and failure. Ongoing support and mentorship would also increase their comfort in using new technologies. Governments and academic institutions should participate by providing subsidies, flexible models of learning, and public-private partnerships to ensure that all older workers have access to affordable and accessible upskilling opportunities.

The findings of this report emphasize that older workers need tailored and comprehensive training programs in digital tools, data management, cybersecurity, and new evolving technologies such as artificial intelligence. These training programs are important to mitigate the increasing gaps in both digital and soft skills that has become more critical for attaining success in the modern evolving labour market. The findings also point out to the need to match the training with the interests of this demographic and basic courses should evolve into the complex ones. Initial modules should introduce basic aspects of digital literacy, such as those focused on using email clients, file storage systems, or office software. This will help to set up a strong foundation and progressively build up technical competencies of workers.

Learning preferences among older workers also considerably differ from those of the younger workers. Our research demonstrates that the older population learns best by experiencing and engaging in practical learning, where the implementation of acquired knowledge in the real world is possible. In this respect, it is especially interesting to use practical education on those digital tools that make everyday work much more efficient and productive, rather than to focus on more abstract or seemingly irrelevant theoretical knowledge. The training that uses real examples of how things are done may be done in the form of interactive workshops or simulations, where learners practice using the new tools in a controlled environment.

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Many older workers feel anxious and insufficient to work with new digital tools, especially in those working environments where younger workers present better capacities to handle them. The report underlines that training programs need to address such psychological barriers within supportive learning environments, where errors represent a process of learning rather than a failure. Also, mentoring schemes, peer-learning groups, and one-to-one personalized coaching may be supportive for helping older workers to gain necessary confidence.

The training program must be also designed with the learning flexibility where a learner can set the pace of his learning. For example, self-learned online courses can be performed by older adults at the time when it is most convenient for them, and thus, relieve them from stress that they may face when in the environment, in which they must keep up with their younger colleagues. Also, the blend of online learning with face-to-face teaching can represent a midway that allows for personalized support combined with the ease of using digital learning tools. There should be also mechanisms for the provision of feedback within the training programs for continuous guidance available to older learners. Feedback from trainers and facilitators helps to make the learning environment more dynamic, thereby allowing for adjustments and fine-tuning of learning strategies of learners.

As stated above, cybersecurity training is of key importance. The heavier organizations lean on their digital tools and data, the greater is the need for them to practice security. Since most of the older employees comes from a time, when the basic cybersecurity measures did not exist, specialized training in cybersecurity could help manage these risks and instruct them how to protect their personal and professional data. But the abstraction level has to be reduced to a minimum. Training programs should also demystify AI and other associated technologies for the older workforce to make them understand how these technologies can be used to enhance their work. This includes such tools as AI-driven analytics that helps workers to make data-related decisions, and use automation that digitizes and speeds up routine activities. If older workers appreciate such technologies and understand that they help them perform their tasks better, they might accept the tools more easily. The report points out that for most older workers, intrinsic motivation, the desire to be relevant in the workplace, should be enough to serve as the primary source of motivation toward their training. Nonetheless, external motivators such as recognition, career advancement, or monetary rewards may deepen their responsiveness to the training efforts. Employers can facilitate this by explicitly relating training outcomes to work performance, promotions, or bonuses, since eventually, they will yield specific returns from the time and effort that workers invest in developing their skills. Also, the training should be viewed as an ongoing, continuous exercise and not just a one-time act. The fast rate of technological change requires that workers pursue lifelong learning to keep abreast with the latest tools and techniques. Enterprises should use a culture of learning by providing updates on training programs, refresher courses, and access to new educational resources.

The report also indicates that older workers have also urgent need to upscale their soft skills which are very important in today's working environment. Even though technical competencies are a must in today's work environment, such soft skills as communication, teamwork, leadership, flexibility, and emotional intelligence represent a significant factor in effective leadership, team work, or employability of automation and artificial intelligence-enabled operations. There has been more pressure to be able to cope with intricate social dynamics, lead diverse teams, and handle stress in fast-shifting environments. The development of soft skills should allow older workers to survive and perform optimally on jobs requiring leadership and collaboration.

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One of the biggest challenges that they face is this change in the functioning of workplaces, driven by digital transformation. In the past, workplaces were more hierarchical and functional. The emphasis was on very specific job functions, where there was no, or very minimal, collaboration across departments. Today, work environments are far more team-based and the cross-functional collaboration has been rapidly increasing. Teams are expected to work jointly across boundaries of a geographical and organizational nature while using digital communication tools and collaborative platforms, whether they work in an office or a remote place. This requires big adaptation of older workers. This applies regardless if their career experience is linked to working in the functional type of an environment. Another practice that may be needed to be acquainted is the ability to communicate using digital media. The ability to differentiate between formal and informal language, the knowledge of the etiquette required during an online meeting are needed for the meeting to be productive. The adaptation of the effective communication rules enables building successful relationships with associates, helps obtain results for projects, and keep away miscommunication that could stall progress.

The next area that should be developed is the teamwork. In today's competitive workplaces, one has to work effectively within a team to drive innovation, improve efficiency, and work at solving problems. The practice has changed a lot and team practices now rely much more on Agile and Scrum methodologies for quick decision-making, flexibility, and iterative work. Training programs for developing collaborative tactics, active listening, and managing or avoiding conflicts can make older workers more comfortable with using newer modes of working in the teams and allow them to become more effective participants. Also, empathy and emotional intelligence represent core critical elements for effective teamwork and can help to overcome generational gaps within teams to ensure that both older and younger team members can work together efficiently.

The leadership skills need to be developed in older employees holding senior management or supervisory positions. The course of leadership has changed with the transformation led by digital technologies. Previously, leadership used to follow a model of command and control, but now it is focused on inclusiveness and support. The term leadership nowadays is understood as being a facilitator who helps the team achieve its goals through empowerment and not by micromanagement and this is what older workers, used to report to very hierarchical leadership styles, will have to become adapted to in today’s team-based, rapidly changing, and technological environment. This includes also skills related to motivating remote teams, utilizing digital tools for monitoring progress and managing tasks, as well as providing constructive feedback in virtual environment. Mentoring in the leadership is very important and can provide younger the benefit of experience of older workers. In turn it can help older people to learn about new technologies.

The soft skill that is of vital significance is the ability to handle stress and uncertainty. The speed with which technology is advancing presents a challenge at the workplace, where dependency on traditional tools and methodologies has formed a basis for the career growth. Remote work has smashed personal and professional life boundaries and the increasing hybrid nature of the environment puts additional pressure on employees at every level within the organization. In addition, older employees who also bear responsibilities for their families, like caring for aging parents, can feel further pressure. The focus on the development of resilience and stress management through mindfulness, time management, and training in adaptability has been shown to lead to better well-being and productivity. Other suitable courses are related to change management, which make older employees to be open to take on change as an opportunity for growth and not a threat to their job security.

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Adaptability represents another critical soft skill that older employees should have. In the current dynamic labor market, the ability to be quick in transitioning to new roles, industries, or technologies is very important. This is especially important given the redefining job roles, and doing away with some traditional roles. The older workers, who may be less familiar with frequent career changes or have a rigid approach, may take the changes the hardest way. The retraining programs on growth mindset, or motivation can be helpful. The use of this approach, can help older workers to turn to new technology and processes as something to be curious about rather than to be scared of, and to be more open to learning and innovation.

The increasing number of firms drive diversity and inclusion initiatives, and as a consequence, workers have to develop necessary interpersonal skills and intercultural competencies to be able perform in a diverse workplace. For instance, they need to understand how to manage polarization, multi-cultural communication, and promote inclusivity, or how to make people feel appreciated. In this way, soft skills that reflect their sensitivity to culture, inclusive leadership, and emotional intelligence equip workers with the readiness to manage a diverse workforce and shape a favorable organizational setting.

One of the major findings of this report is, that older workers are highly motivated to learn as long as the conditions are adapted to their needs, whereas they fail in various training programs that do not fit into this framework. The examples such as the practice and on-site training were reported as the most preferred training methods for older workers. In this regard, it is instrumental to provide hands-on learning in which participants practice and apply learned principles during the training. Unlike younger workers, who are comfortable with digital learning platforms, older workers usually request experiential learning allowing them to acquire ability to apply the new tool in their day-to-day work immediately. For example, older workers might not gain as much from general courses on cloud services; they might gain more by learning specific applications, such as how to manage shared files or set up remote video meetings.

The face-to-face training has been particularly favored by older adults, as real-time feedback with responses from and interactions with trainers sharpen their learning. This population subgroup prefers learning within the confines of a familiar setting. Such learning enables an increased adoption and acceptance of digital tools. Older workers can feel isolated or overwhelmed in the self-paced online learning. Onsite training also helps to foster peer learning so that trainees can share experiences and solve problems together while building a community of learners around the learning process. This kind of learning has makes the learning process less isolated and can reduce or stop feelings of incompetence when facing technological challenges.

Both digital and soft skill gaps among older workers have serious implications for labor market competitiveness if the country is to meet its national digital transformation goals. These skills need to be improved in the older labor force not only to benefit individuals in terms of their employability, but to ensure the economic performance and sustainability of the national economy. In the absence of strategic policy intervention to close these gaps, it can result in a situation of likely scarcity of digitally skilled labor force and yet the presence of a large proportion of labor that is underutilized.

With the transition of industries to automation, digitization, and knowledge-based economies at an increasing pace, the demand for technical (e.g., digital literacy, data, cybersecurity) and soft skills has grown. The demand in such industries as manufacturing, financial services, healthcare, and logistics has witnessed considerable surges that reflect the urgency of upskilling the workforce with digital readiness and continuous learning. Meanwhile,

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due to the high share of older workers in the labor force, older workers are likely to be left behind during the transition. If older workers are not provided with new skills, their incapacity to handle new machines and ways of working may increase unemployment or underemployment in less qualified jobs, which generally has a drag effect on productivity.

On the other hand, a shortage of digitally skilled workers may perpetuate a skill-employment gap, where available labor force does not have necessary skills. This may also increase the cost of doing business, since companies will invest more in training new employees, or they may bring in labor from other countries to cover for the deficiency in specific technical capabilities. The lack of investment in developing the IT and soft skills of older labor force is associated with huge opportunity costs for the public and private sectors.

Another area of concern is the lack of support for older workers in bridging the intergenerational gap. This can occur if older workers do not manage the digital transition as seamlessly as their younger colleagues. This gap can lead to a number of inefficiencies as organizations have to find a way to integrate and work with different generations. After closing the digital and soft skills gaps, countries such as Slovakia can turn its aging workforce from a challenge into a source of competitive advantage. It has been noted that older employees bring years of experience, industry-specific knowledge, and leadership skills necessary to mentor their younger co-workers in face of complex business challenges. For instance, a manufacturing process-knowledgeable manager may be more capable of creating value if he/she is capable of handling analytical tools for data optimization in production or leading digitally enabled teams. Soft-skill improvement for older worker especially related to leadership and communication can serve as a driving force that can enable them to handle more strategic responsibilities within their respective companies. Older workers having such skills can be expected to drive cross-generational teams towards innovation.

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Annexes

Annex 1 – Questionnaire

Socio-Economic Questions

1. **What is your gender?**
    a. Male
    b. Female
    c. Non-binary

2. **What is your age group?**
    a. Less than 50 – stop here
    b. 50-55
    c. 55-59
    d. 60-65
3. **What is your highest level of education achieved?**
    a. Less than high school – stop here
    b. High school diploma or equivalent
    c. Full higher education
    d. Doctorate

4. **Where do you reside? (The response options varied depending on the country where the survey was conducted)**
    a. Eastern Slovakia
    b. Central Slovakia
    c. Western Slovakia
    d. Capital city Bratislava

Digital Skills Questions

5. **How comfortable are you with using new digital tools (e.g., software, applications) in your work?**
    a. Very uncomfortable
    b. Uncomfortable
    c. Neutral
    d. Comfortable
    e. Very comfortable
6. **How often do you use software or other digital tools in your work?**
    a. Never
    b. Rarely
    c. Sometimes
    d. Often
    e. Very often
7. **Have you received any training to understand or use digital tools in your current workplace?**
    a. No training
    b. Minimal training
    c. Some training, but not sufficient

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d. Comprehensive and sufficient training

8. **How skilled are you at managing digital files (e.g., creating folders, naming files, using cloud storage)?**
    a. Not skilled at all
    b. Slightly skilled
    c. Medium skilled
    d. Skilled
    e. Very skilled
9. **How often do you use video conferencing tools (e. g. Zoom, Microsoft Teams)?**
    a. I don't use them at all
    b. I rarely use them
    c. I sometimes use them
    d. I regularly use them
    e. I use them very often
10. **How often do you use cloud-based services (e.g., online storage)?**
    a. Never
    b. Rarely
    c. Sometimes
    d. Often
    e. Very often
11. **Do you feel comfortable with the idea of your personal data being stored on cloud servers?**
    a. Not comfortable at all
    b. Slightly uncomfortable
    c. Neither comfortable nor uncomfortable
    d. Somewhat comfortable
    e. Very comfortable
12. **How familiar are you with the concept of generative artificial intelligence (AI) and its applications in the workplace?**
    a. Very unfamiliar
    b. Unfamiliar
    c. Somewhat familiar
    d. Familiar
    e. Very familiar

Cybersecurity and Data Protection

13. **How familiar are you with the concept of cybersecurity?**
    a. Not familiar at all
    b. Not very familiar
    c. Neither familiar not unfamiliar
    d. Somewhat familiar
    e. Very familiar
14. **How often do you use two-factor authentication (2FA- e.g., Google Authenticator, SMS code, finger print) for your online accounts?**
    a. Never
    b. Rarely
    c. Sometimes

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d. Often
e. Always

15. **How cautious are you when opening emails or clicking on links from unknown senders?**
    a. I am not cautious at all
    b. I am cautious, but only sometimes
    c. I am mostly cautious
    d. I am almost always very cautious
    e. I am always very cautious

Specific Digital Skills Competence

16. **How frequently do you feel confident in your ability to learn and use new digital tools and technologies?**
    a. Never
    b. Rarely
    c. Sometimes
    d. Often
    e. Always
17. **How would you rate your overall competence with the use of office software (e.g., MS Office, Google workspace)?**
    a. I find it very difficult to use office software.
    b. I struggle with the effective use of office software.
    c. I neither find it easy nor difficult to use office software.
    d. I am almost always able to use office software effectively.
    e. I excel at using office software effectively.

18. **How comfortable are you with managing emails, including organizing, filtering, and using advanced features?**
    a. I find it very difficult to manage emails effectively.
    b. I struggle to manage emails effectively.
    c. I neither find it easy nor difficult to manage emails.
    d. I am able to manage emails effectively.
    e. I excel at managing emails effectively.

19. **How skilled are you at using tools for data analysis and visualization (e.g., Excel, Google Sheets, Tableau, SPSS)?**
    a. I am not able to use data analysis and visualization tools at all.
    b. I have limited skills in using data analysis and visualization tools.
    c. I have moderate skills in using data analysis and visualization tools.
    d. I am able to use data analysis and visualization tools almost always effectively.
    e. I excel at using data analysis and visualization tools effectively.

Soft Skills Questions

20. **How would you rate your effective communication and active listening skills?**
    a. Very Poor
    b. Poor

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c. Average
d. Good
e. Excellent

21. **How easily are you able to build trust and good relationships with co-workers/team members?**
    a. I find it very difficult
    b. I find it quite difficult
    c. I find neither difficult nor easy
    d. I find it quite easy
    e. I find it very easy

22. **How comfortable are you with providing constructive feedback in the workplace?**
    a. Very uncomfortable
    b. Uncomfortable
    c. Neither comfortable nor uncomfortable
    d. Comfortable
    e. Very comfortable

23. **How comfortable are you with receiving constructive feedback in the workplace?**
    a. Very uncomfortable
    b. Uncomfortable
    c. Neither comfortable nor uncomfortable
    d. Comfortable
    e. Very comfortable

24. **Do you know any of the following management processes? Kanban, Kaizen, Total Quality Management, Just in Time.**

a. I don't know any of them
b. I know some of them, specify which ones .....
c. I know all of them
d. I know other management processes, specify which ones .....

25. **How effectively are you able to manage stress and uncertainty in the workplace related to digitalization?**
    a. Not at all effectively
    b. Hardly ever effective
    c. Somewhat effective
    d. Quite effective
    e. Very effectively

Motivation and Training Needs

26. **What motivates you to learn new digital technologies for office use? (Select the most appropriate)**
    a. Higher salary
    b. Promotion
    c. Interest in new technologies
    d. I have no motivation to learn new technologies

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e. I have other motivation to learn new technologies (please, specify).....

27. **What is the most distressing aspect of using digital technologies for office use? (Select all that apply)**
    a. I have never used digital technology before
    b. I do not understand the digital technology
    c. I am afraid to make mistakes
    d. Fear of being dismissed for not being capable of using digital technology
    e. Other (please, specify).....
28. **What type of training would be most effective for you in gaining the knowledge you need for your job? (Select all that apply)**
    a. Online video tutorials/training
    b. Onsite training
    c. Written manuals
    d. Practical examples
    e. Other (please, specify).....

Continuous Improvement and Learning

29. **How often do you actively participate in continuous improvement initiatives (e.g., process improvements, skill development programs) in your workplace?**
    a. Never
    b. Rarely
    c. Sometimes
    d. Often
    e. Always

30. **How do you deal with changes and uncertainties in your workplace?**
    a. I find it very difficult to deal with changes and uncertainty
    b. I find it quite difficult to deal with changes and uncertainty
    c. I find it neither easy nor difficult to deal with changes and uncertainty
    d. I find it relatively easy to deal with changes and uncertainty
    e. I find it very easy to deal with changes and uncertainty

31. **How familiar are you with the concept of 'continuous improvement' in a workplace setting?**
    a. Very familiar and I apply it regularly.
    b. Somewhat familiar, but I do not apply it much.
    c. Not familiar at all.

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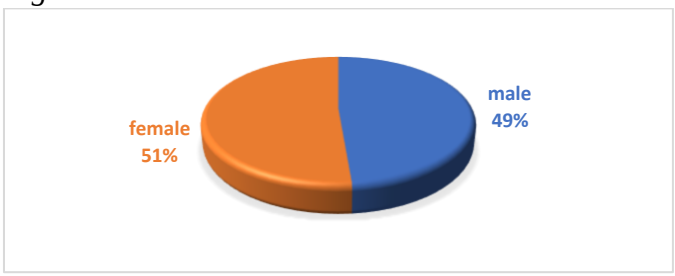
Annex 2 - Results of the Survey for Slovakia

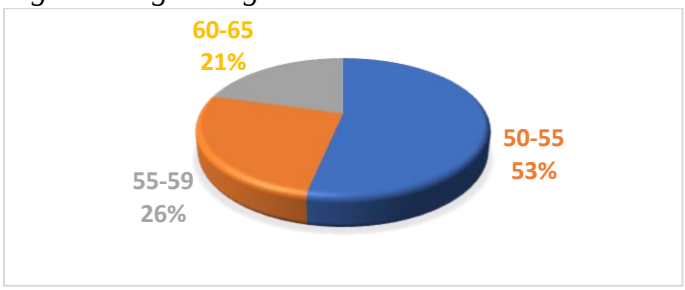
Socio-economic aspects

Figure 1: Gender distribution



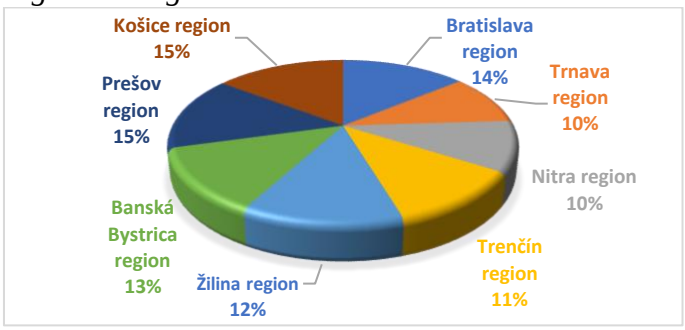
Source: Author's own, based on data from the questionnaire

Figure 2: Age categories distribution



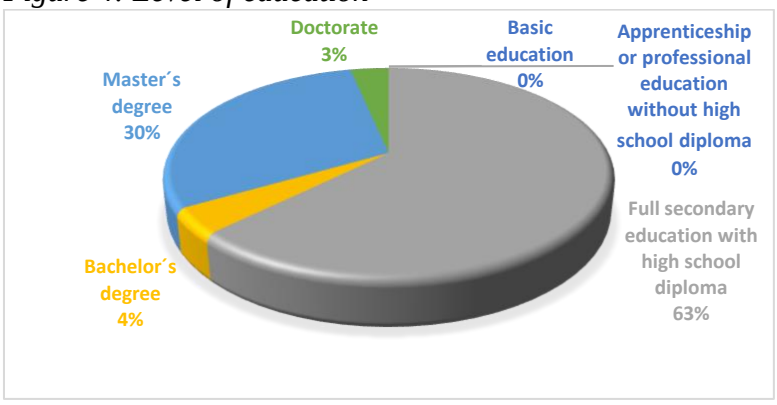
Source: Author's own, based on data from the questionnaire

Figure 3: Regional distribution



Source: Author's own, based on data from the questionnaire

Figure 4: Level of education



Source: Author's own, based on data from the questionnaire

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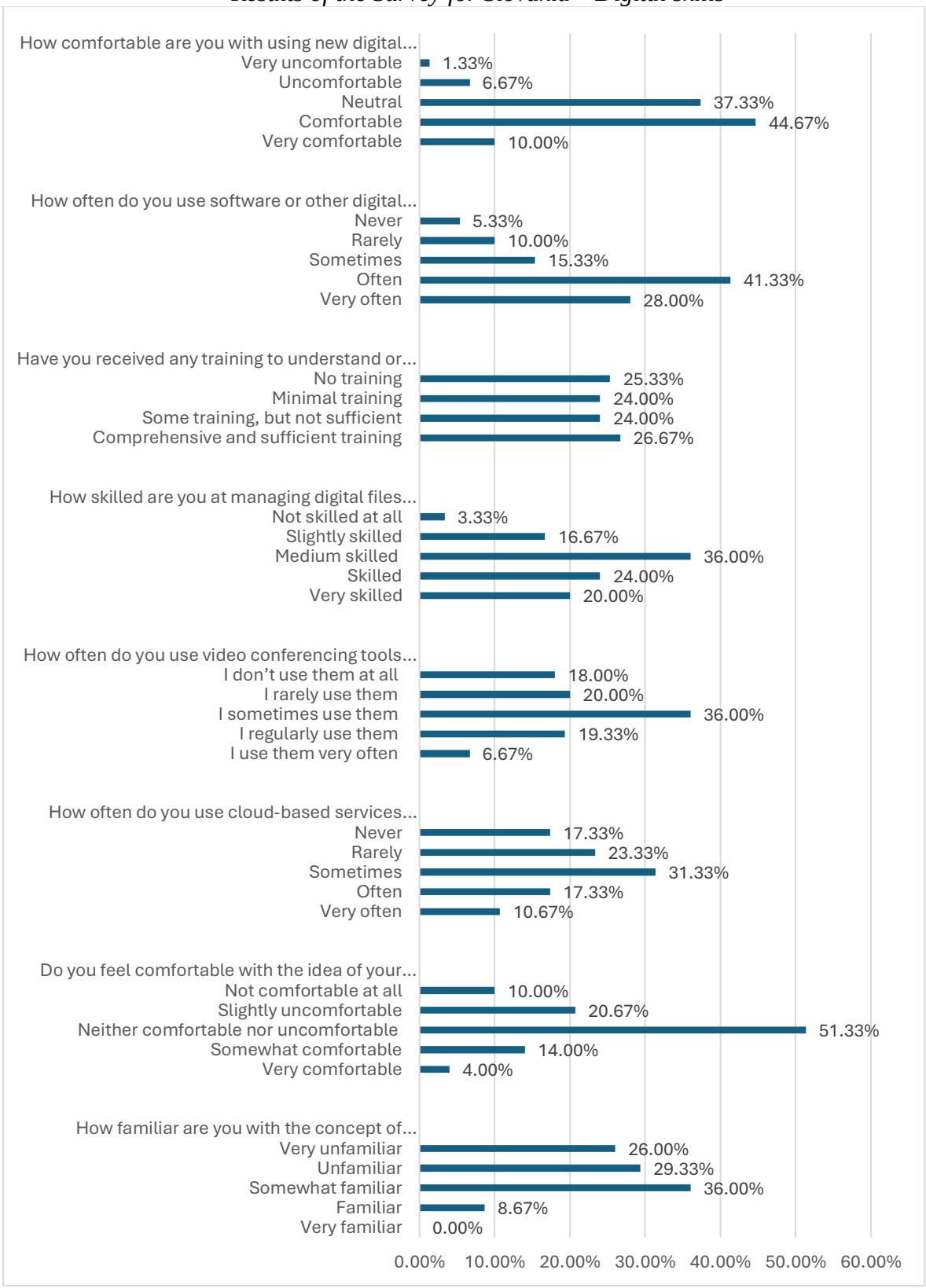
Results of the Survey for Slovakia – Digital skills



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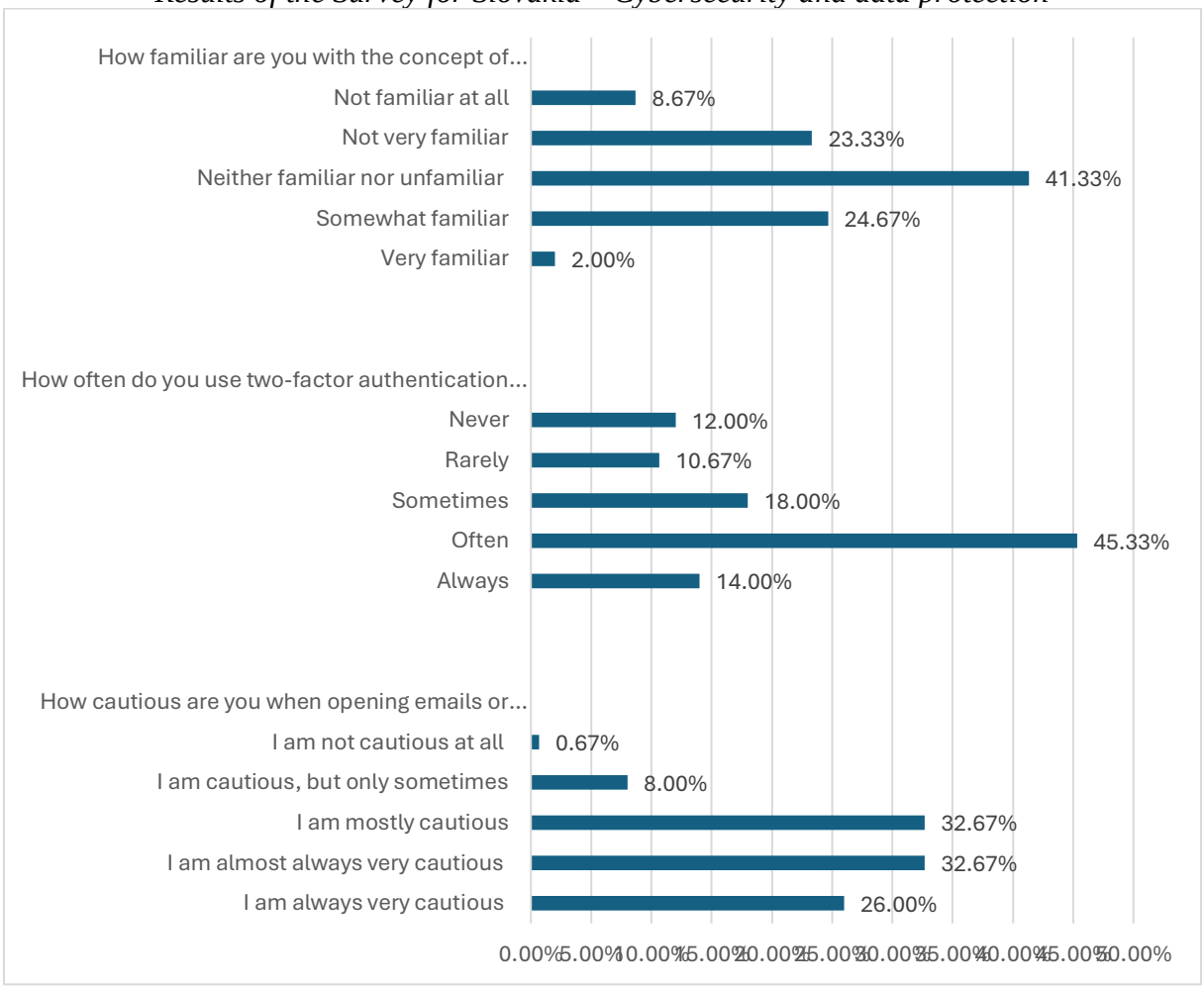
Results of the Survey for Slovakia – Cybersecurity and data protection



Source: Author's own, based on data from the questionnaire

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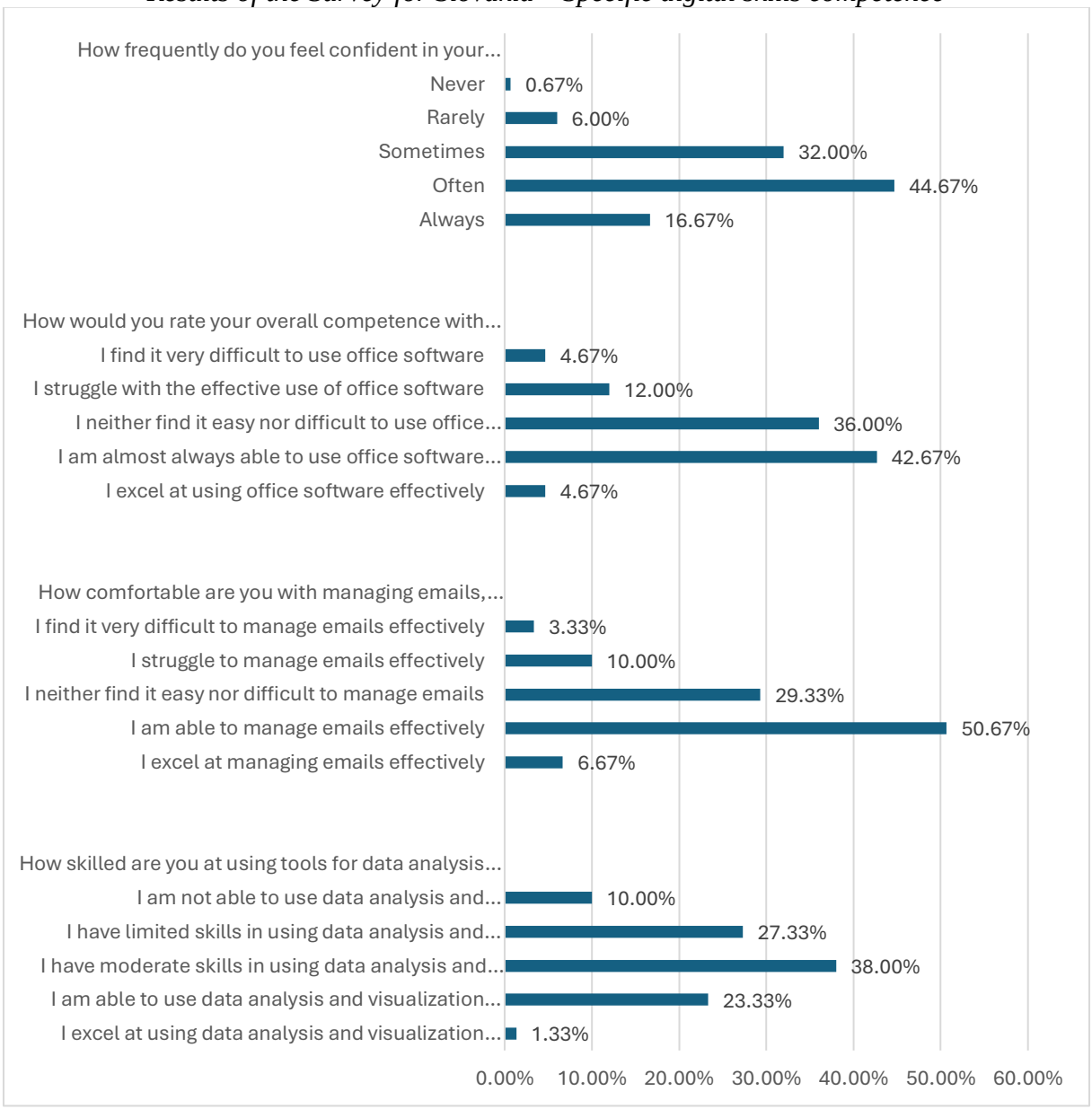
Results of the Survey for Slovakia – Specific digital skills competence



Source: Author's own, based on data from the questionnaire

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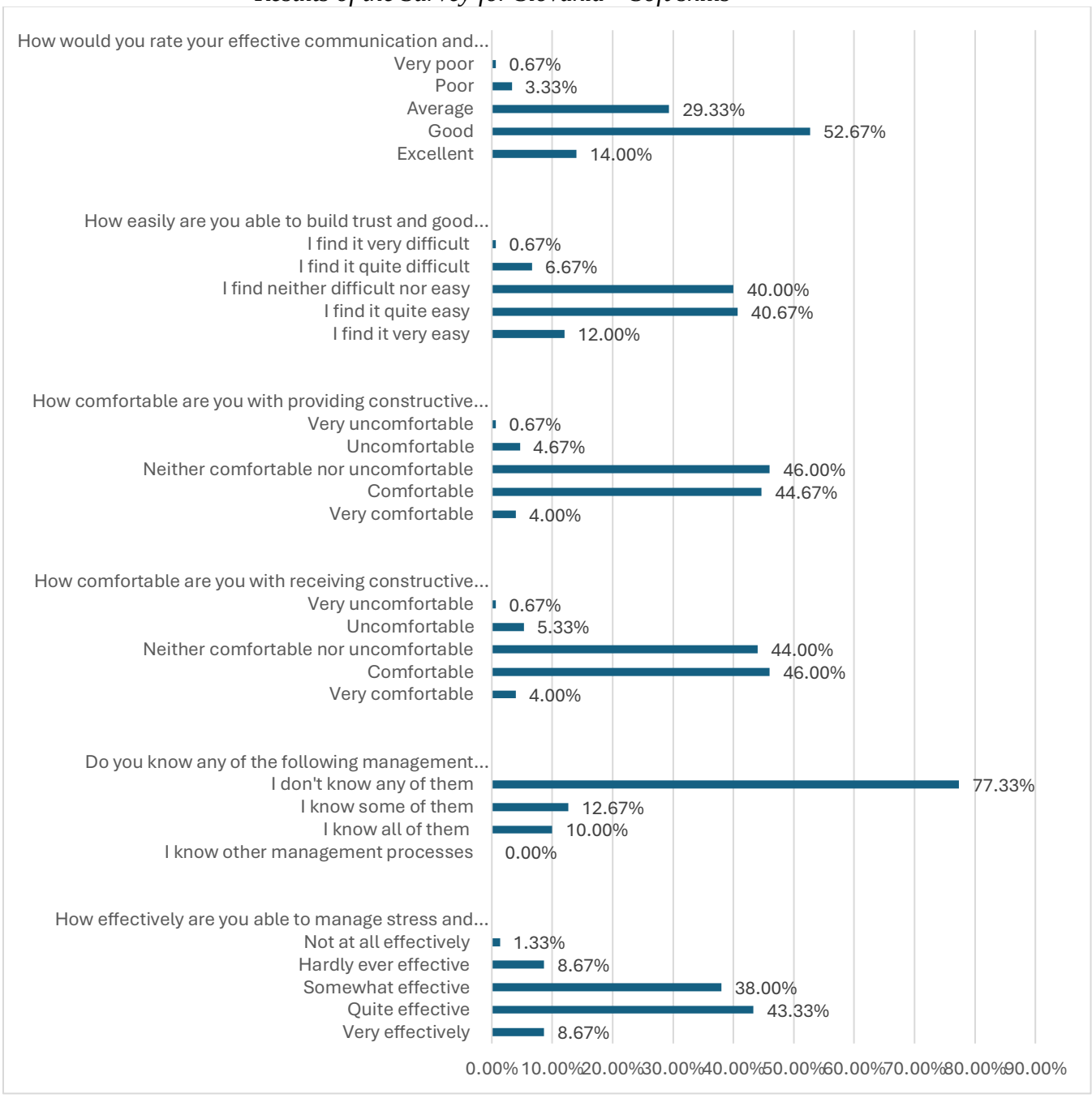

Source: Author's own, based on data from the questionnaire

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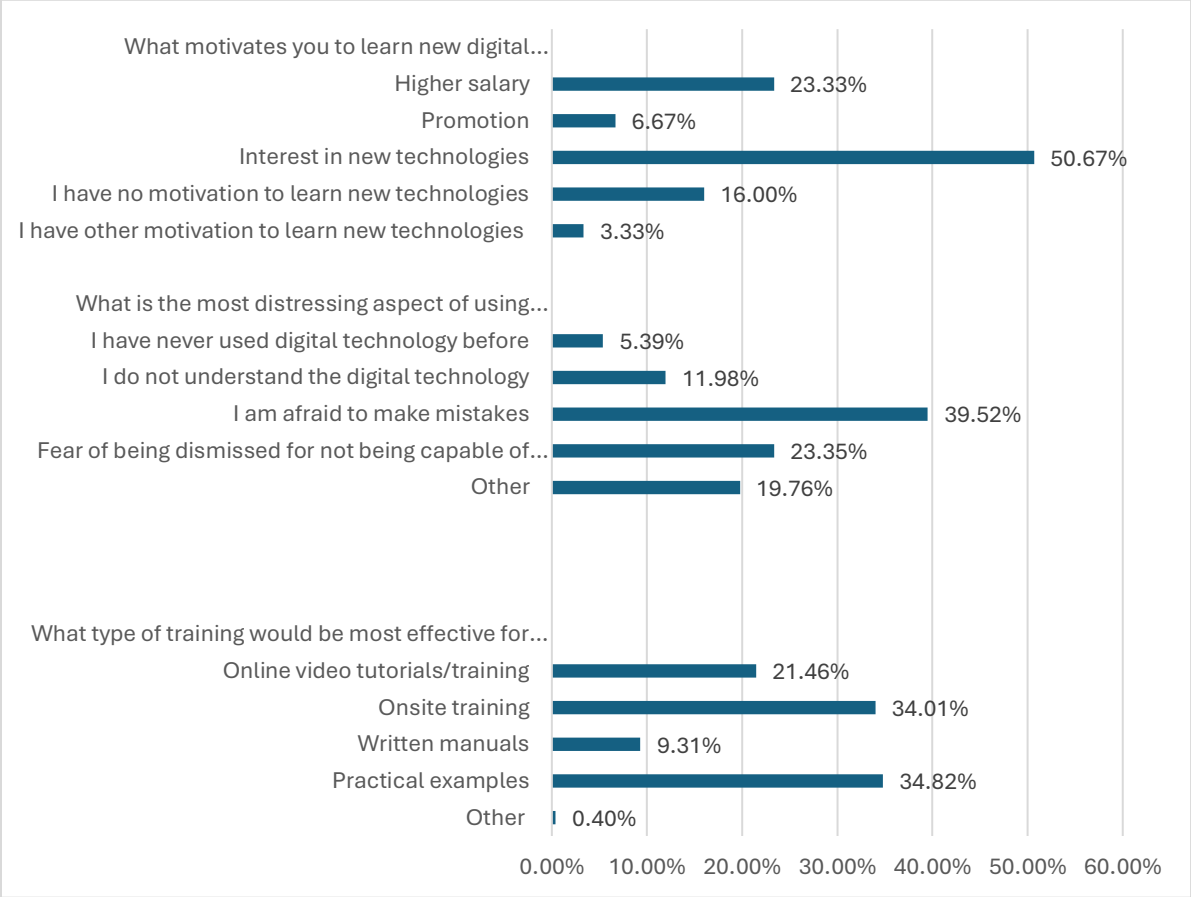
Results of the Survey for Slovakia – Motivation and training needs



Source: Author's own, based on data from the questionnaire

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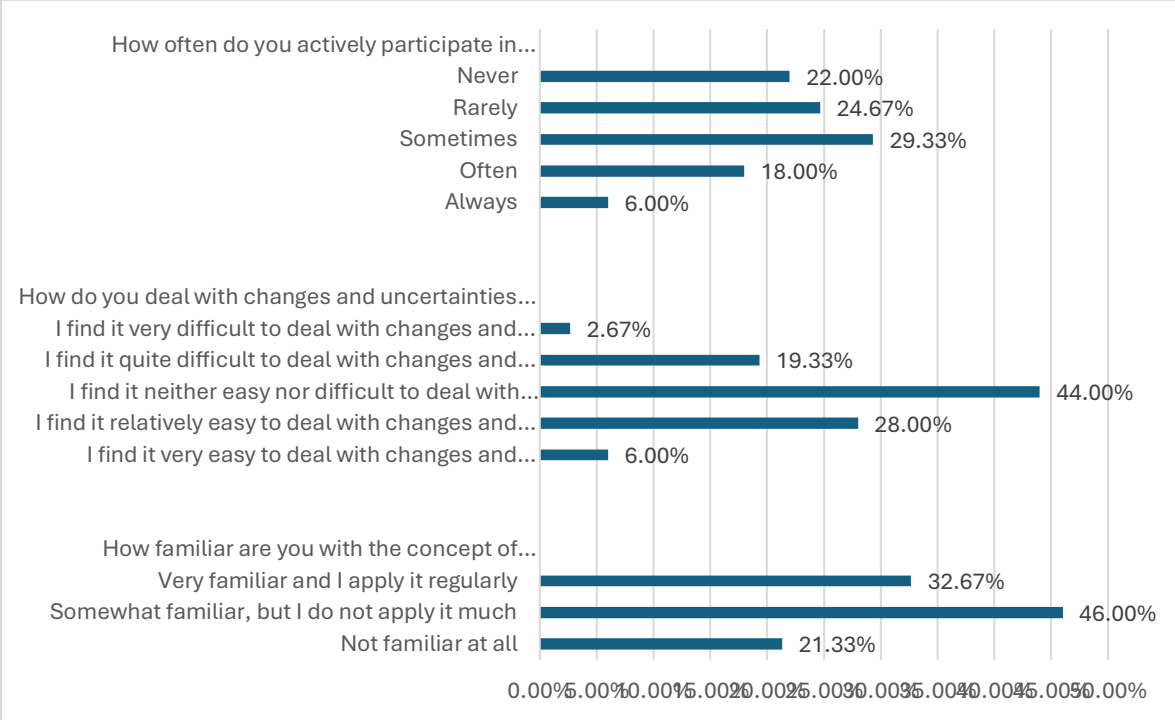
Results of the Survey for Slovakia – Continuous improvement and learning



Source: Author's own, based on data from the questionnaire

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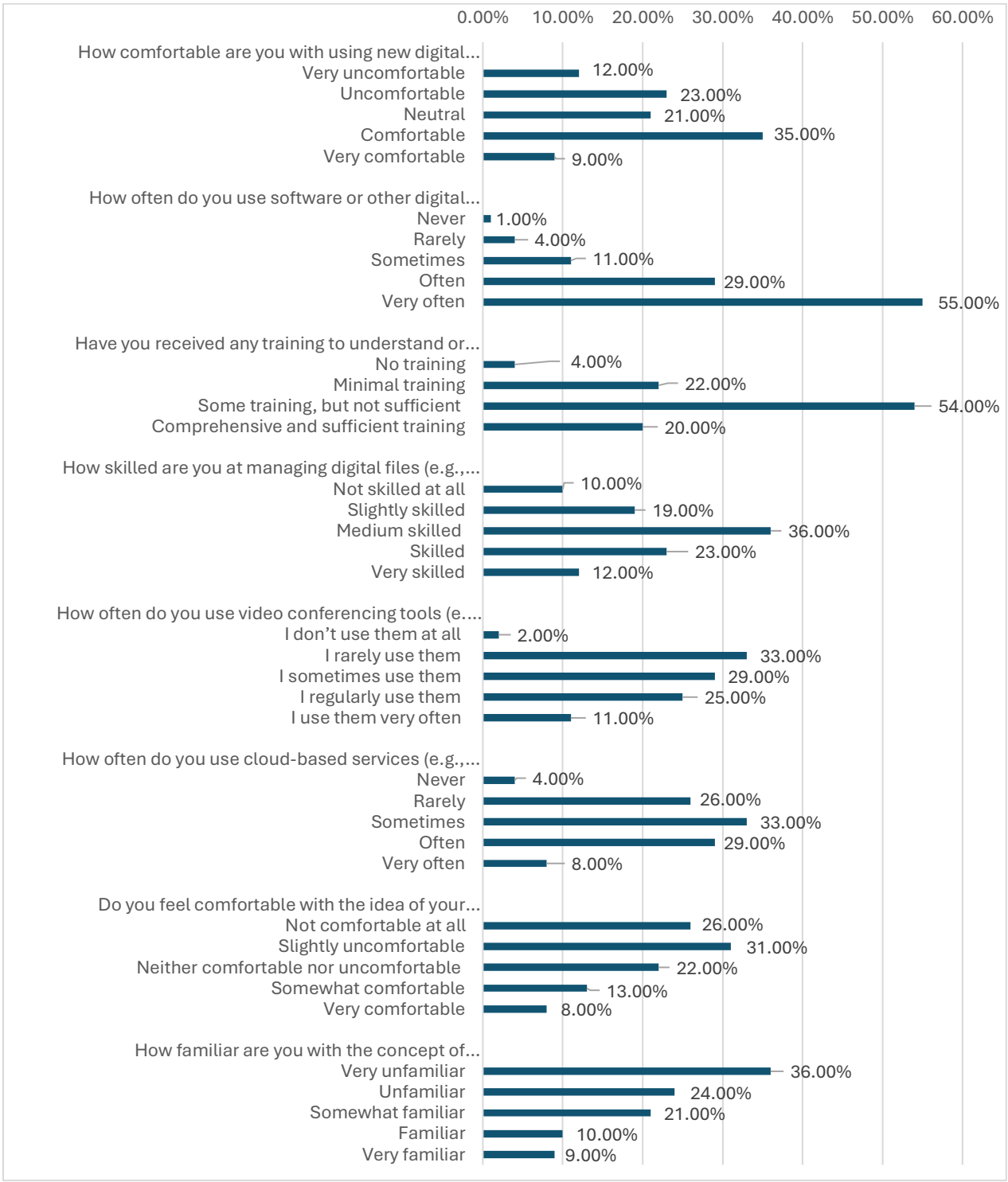
Annex 3 - Results of the survey for Czech Republic

Results of the survey for Czech Republic - Digital Skills



Source: Author's own, based on data from the questionnaire

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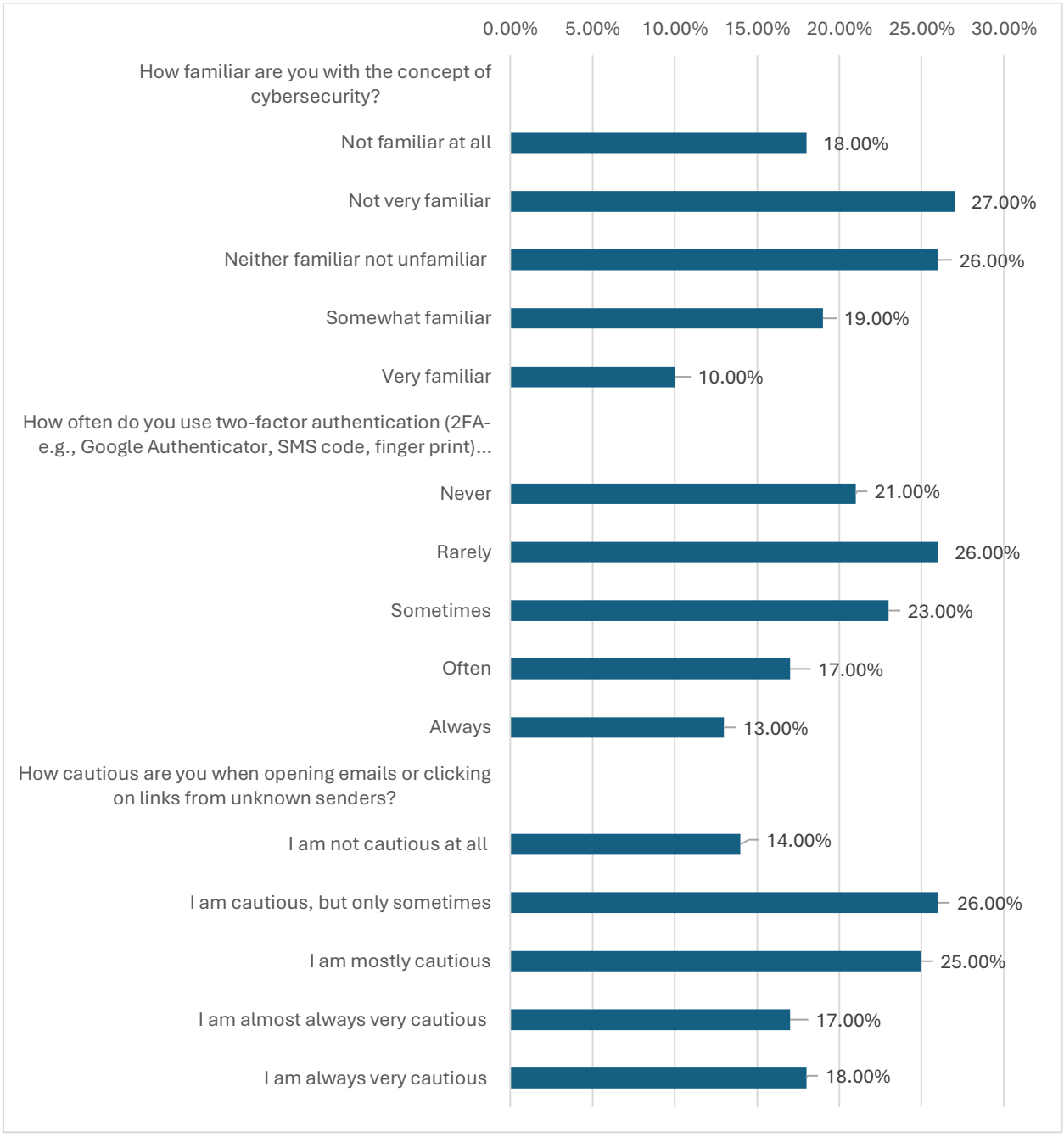
Results of the survey for Czech Republic - Cybersecurity and Data Protection



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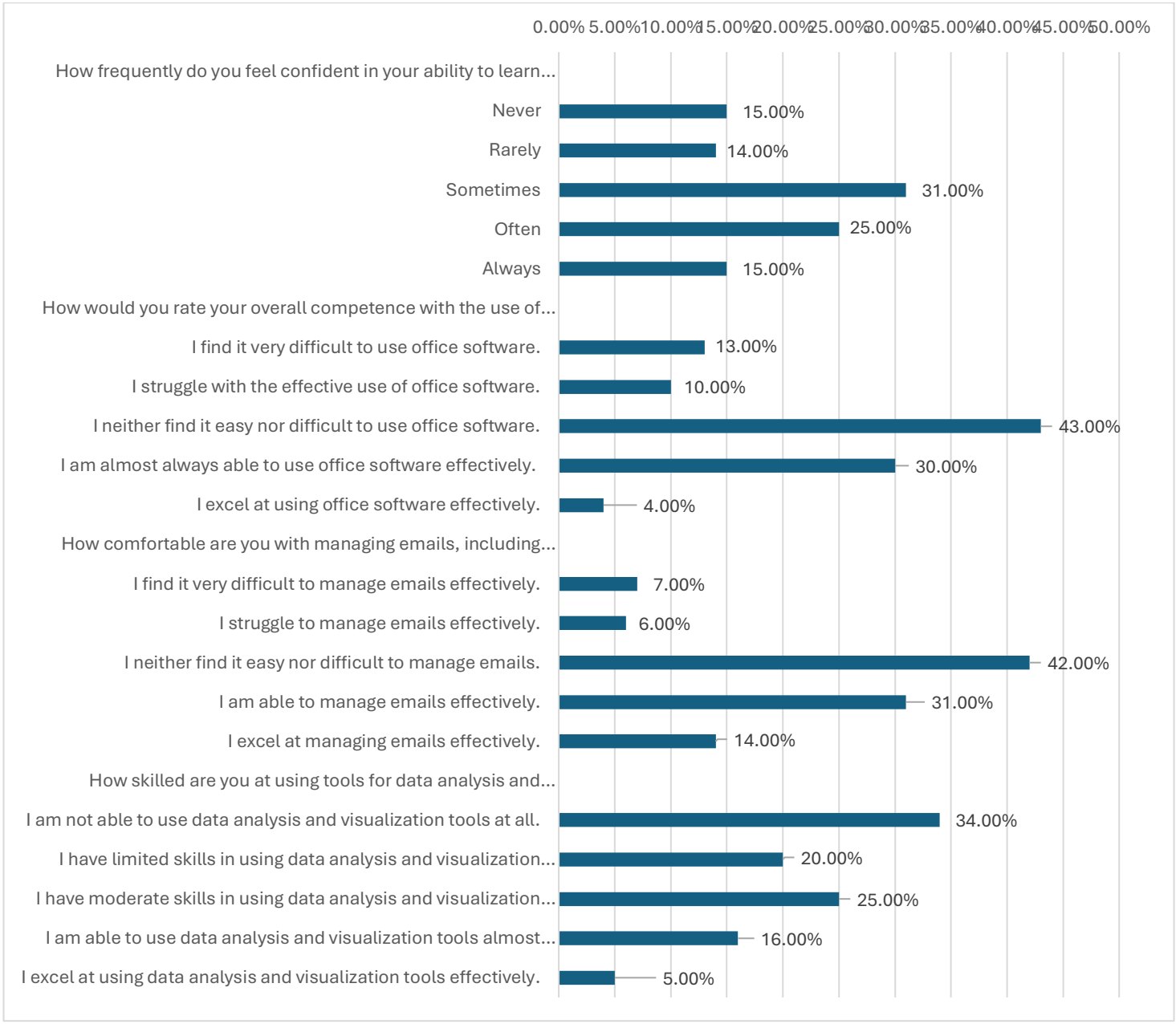
Results of the survey for Czech Republic - Specific Digital Skills Competence



Source: Author's own, based on data from the questionnaire

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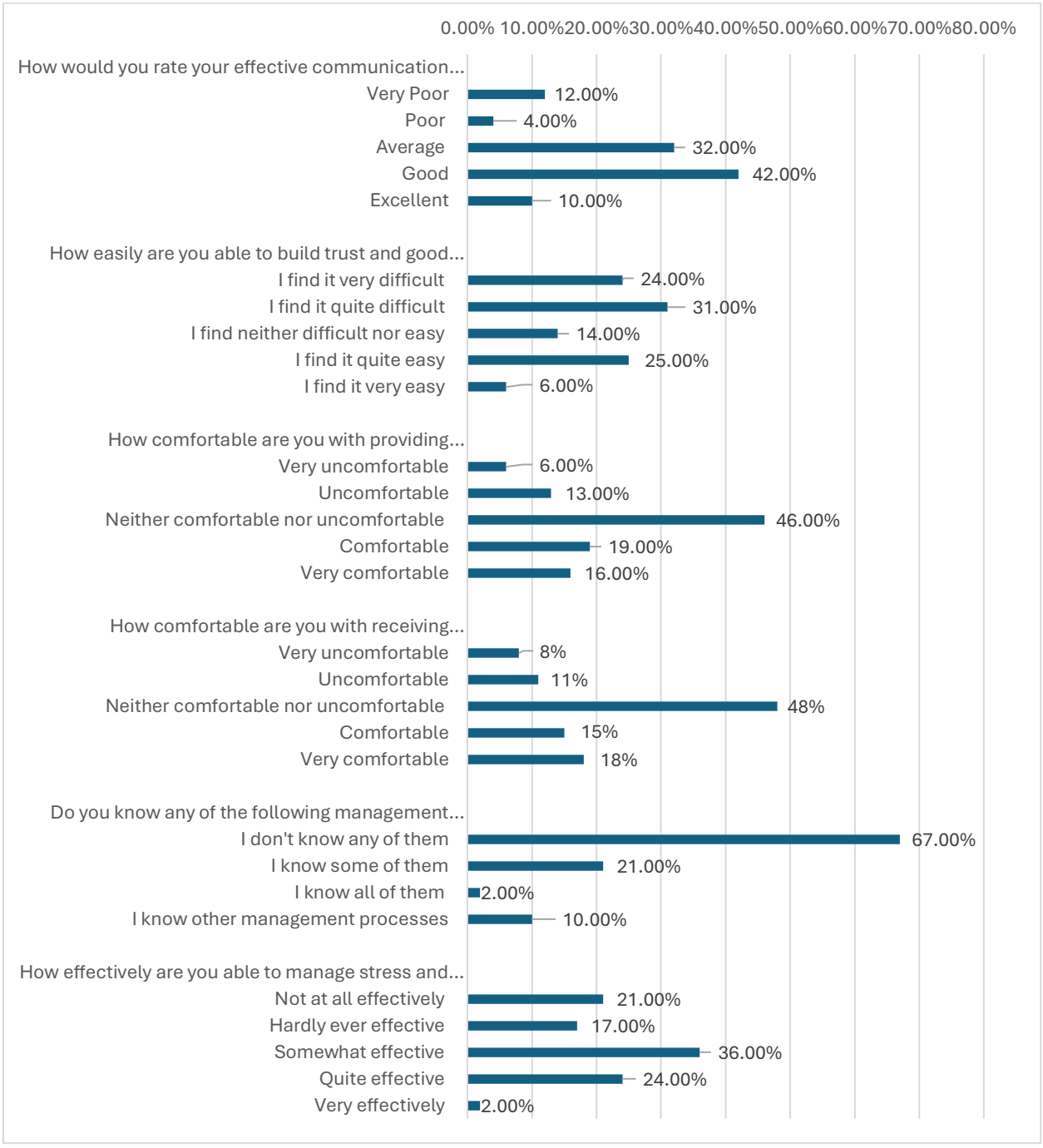
Results of the survey for Czech Republic - Soft Skills



Source: Author's own, based on data from the questionnaire

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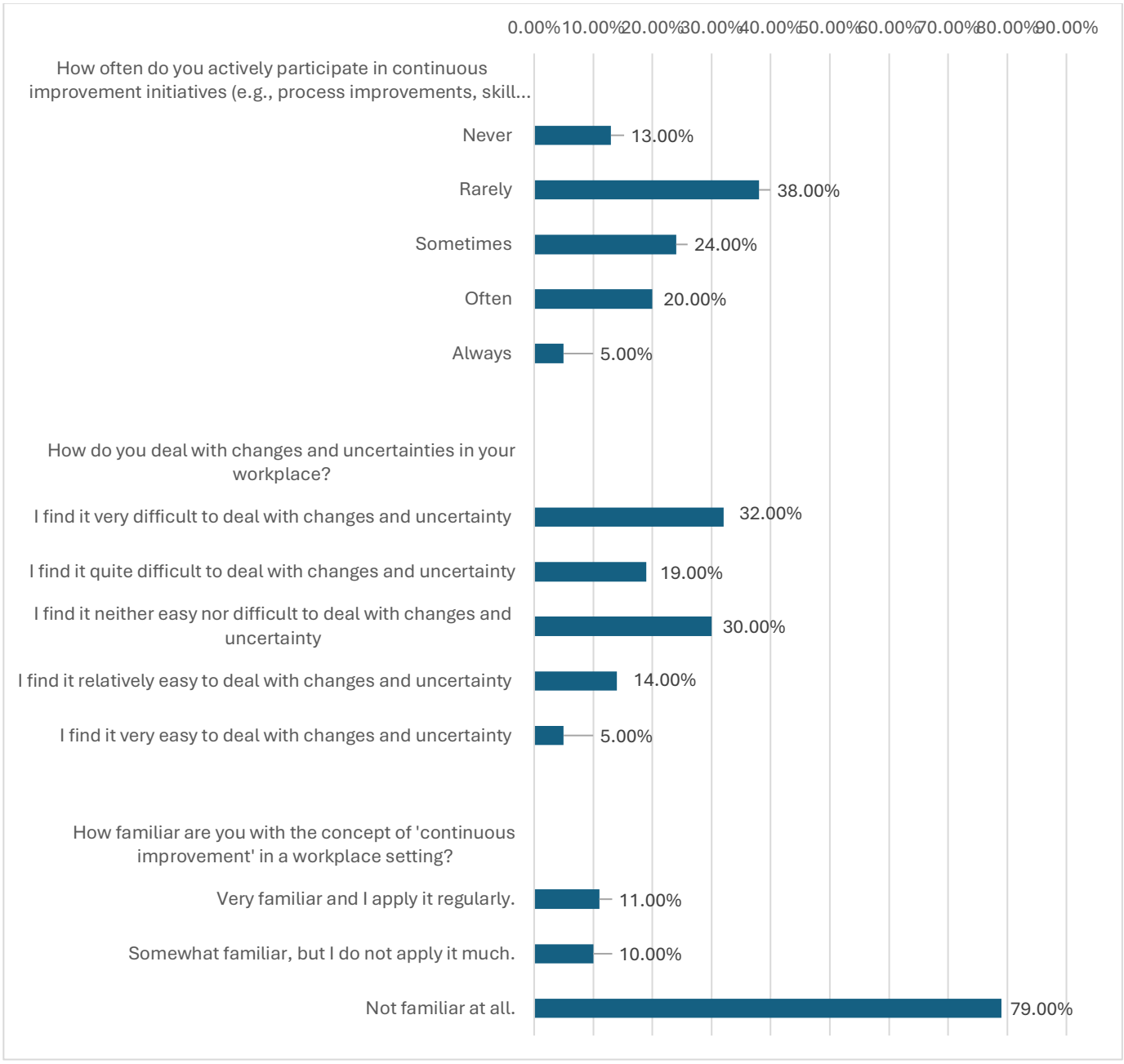
Results of the survey for Czech Republic - Continuous Improvement and Learning



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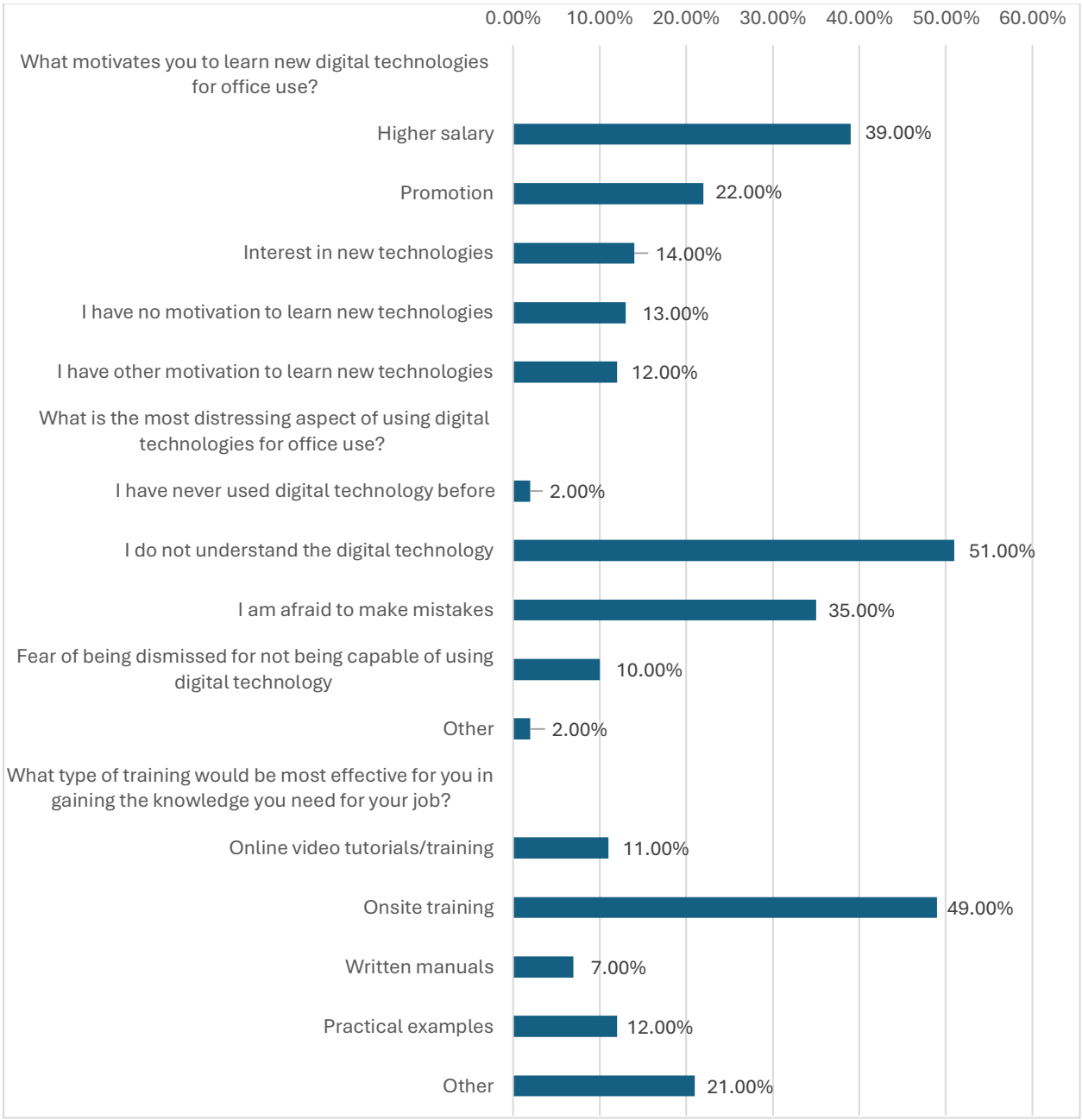
Results of the survey for Czech Republic - Motivation and Training Needs



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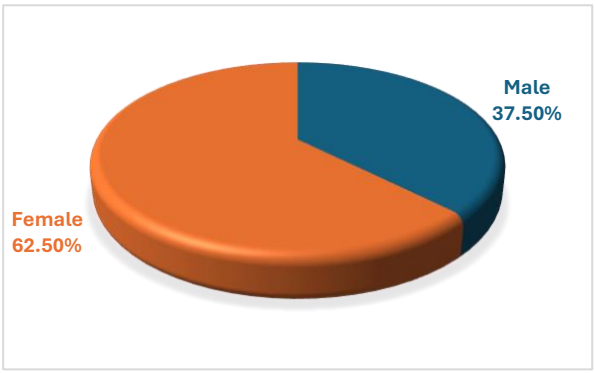
Annex 4 - Results of the survey for Spain

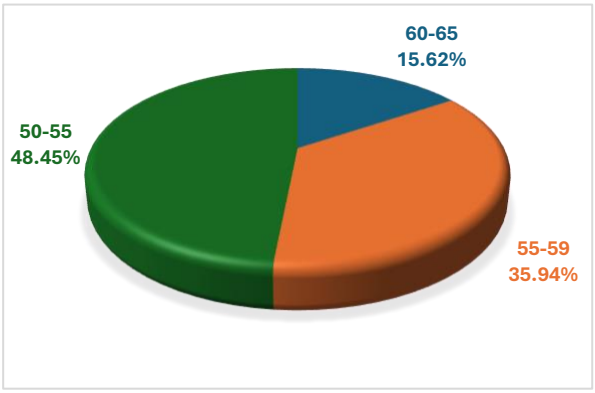
Socio-economic aspects

Figure 1: Gender distribution



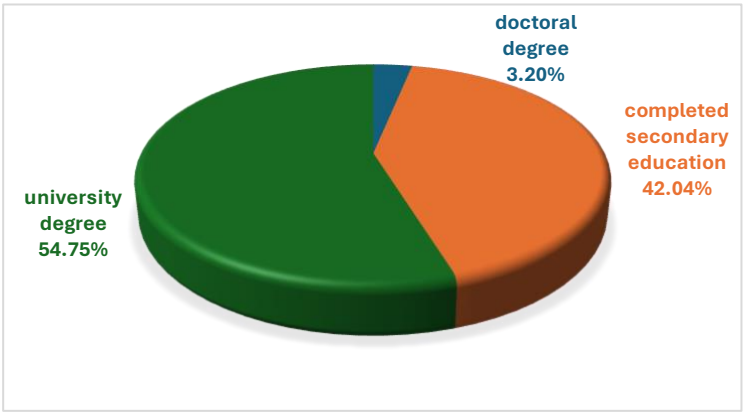
Source: Author's own, based on data from the questionnaire

Figure 2: Age categories distribution



Source: Author's own, based on data from the questionnaire

Figure 3: Level of education



Source: Author's own, based on data from the questionnaire

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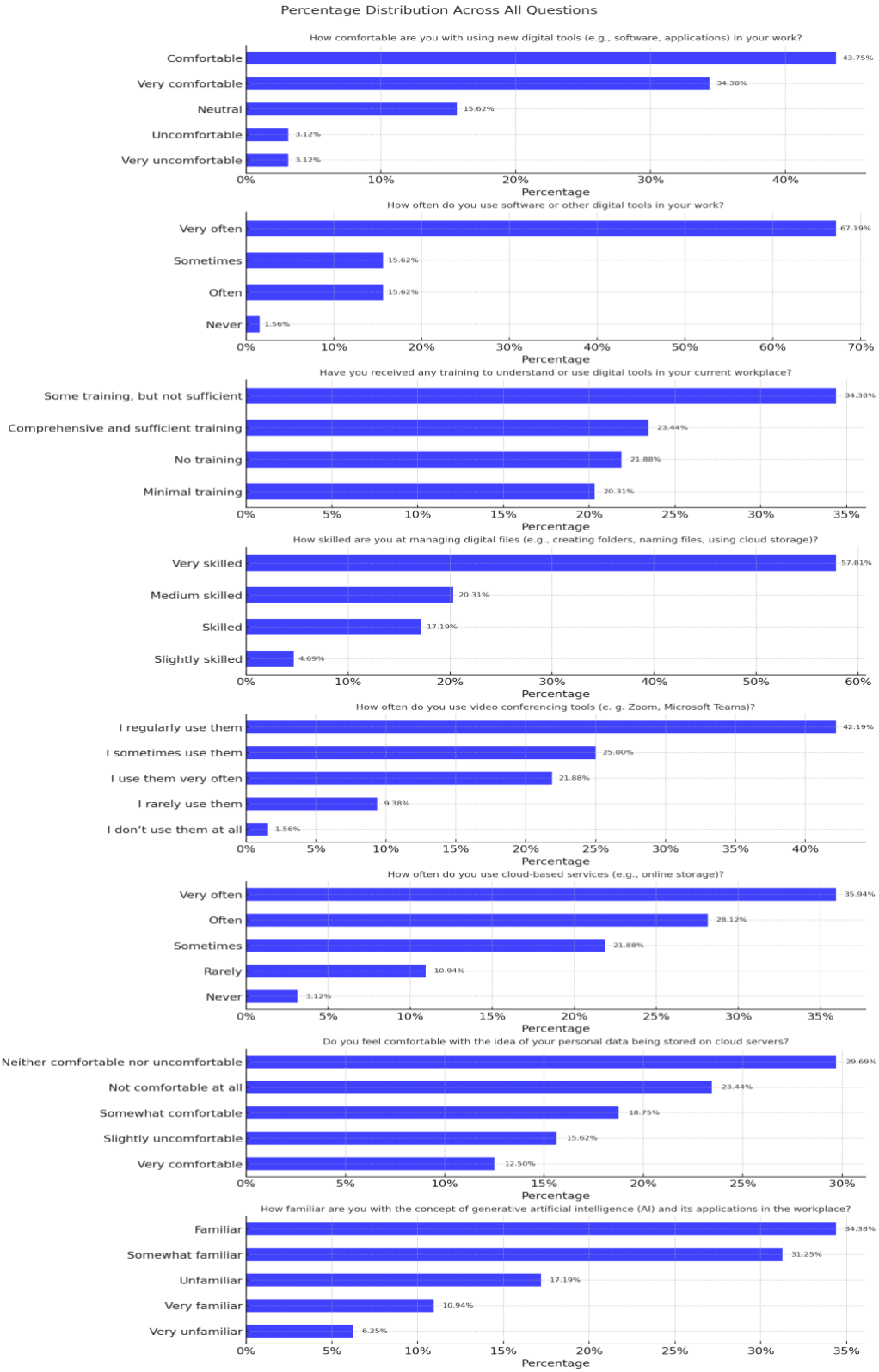
Results of the survey for Spain - Digital Skills



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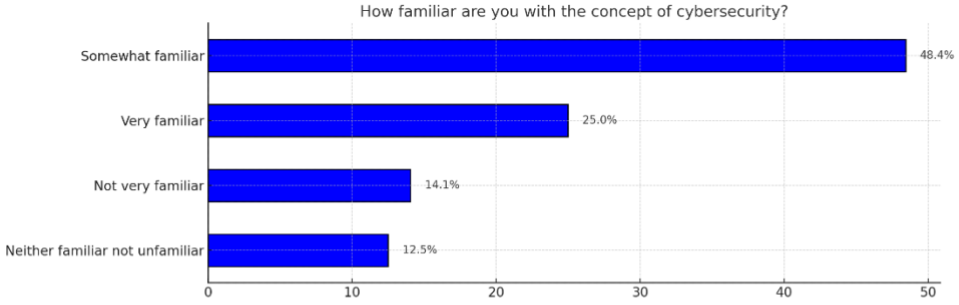

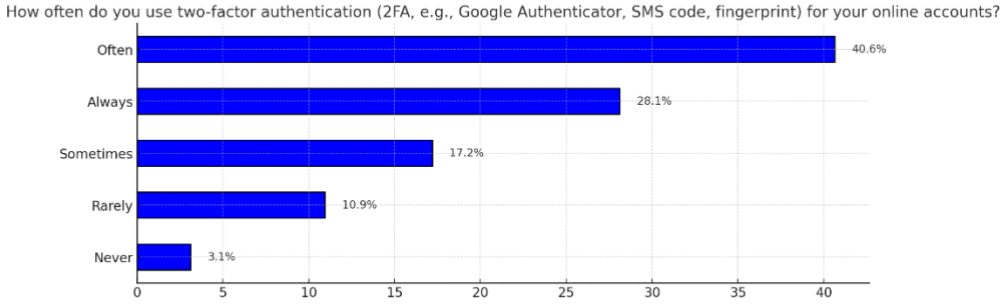

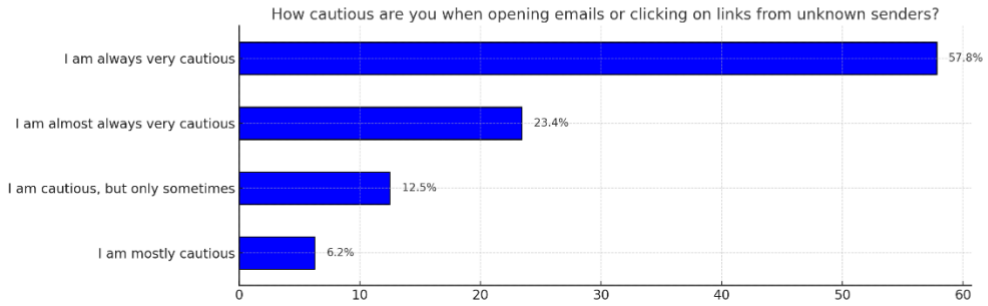

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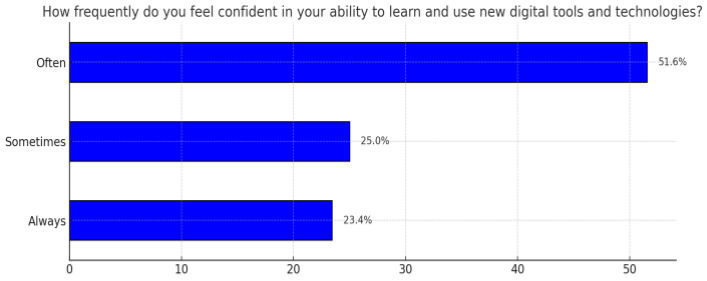

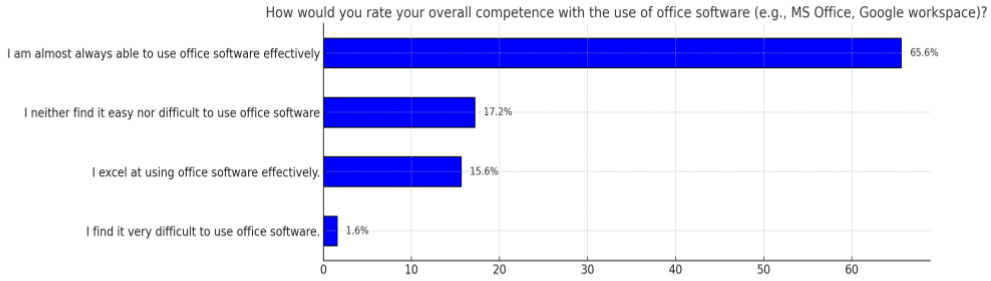

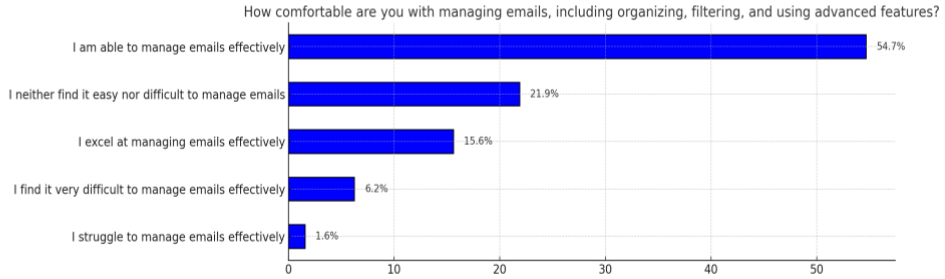

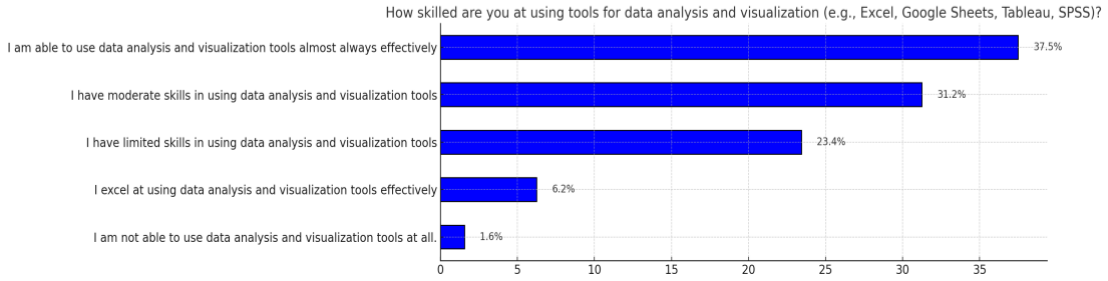

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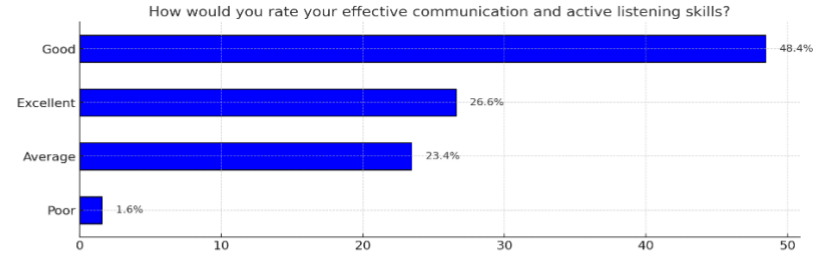

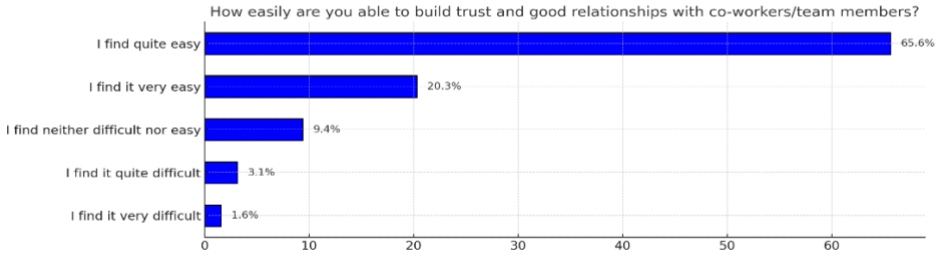

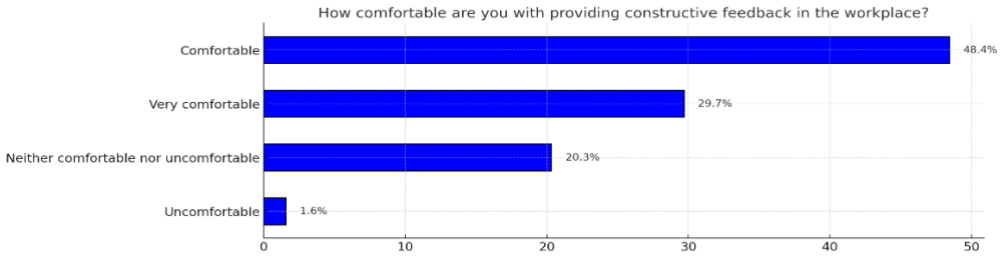

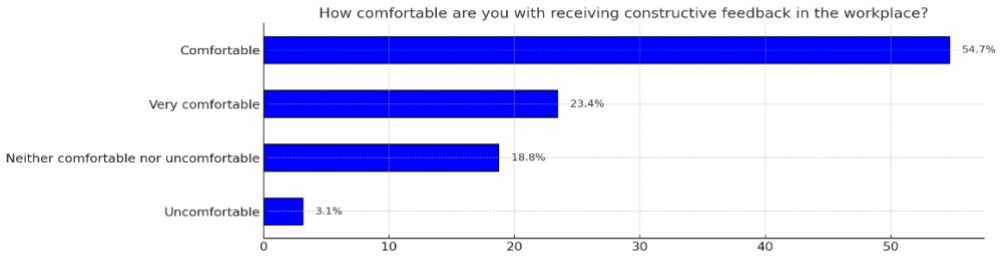

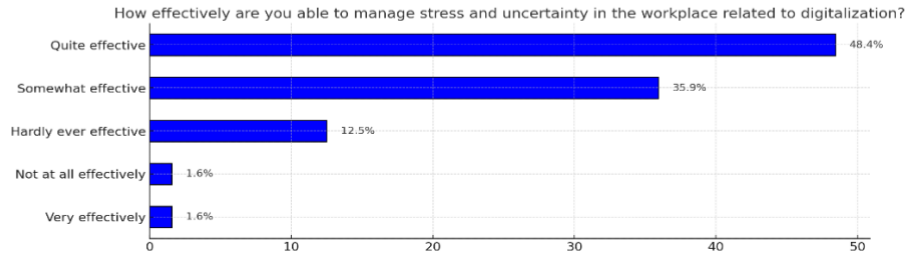

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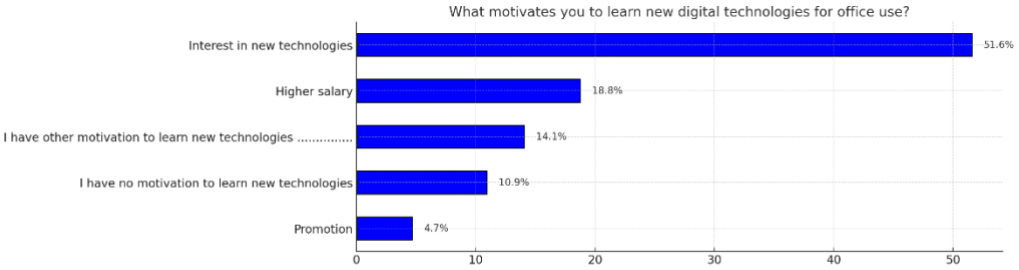

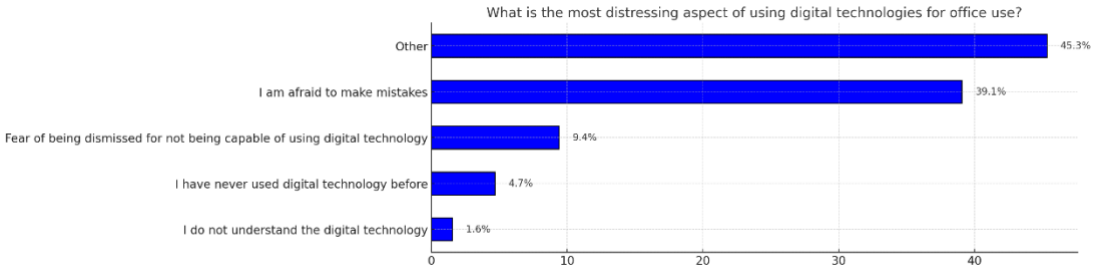

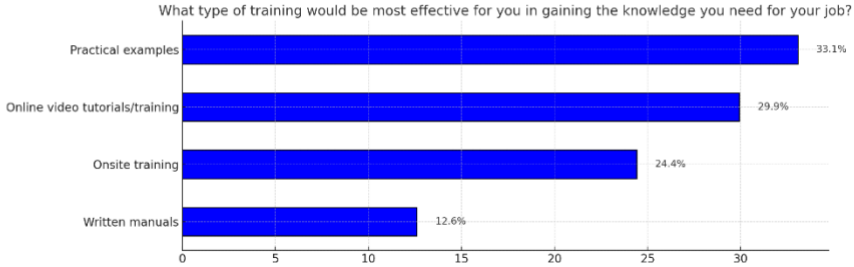

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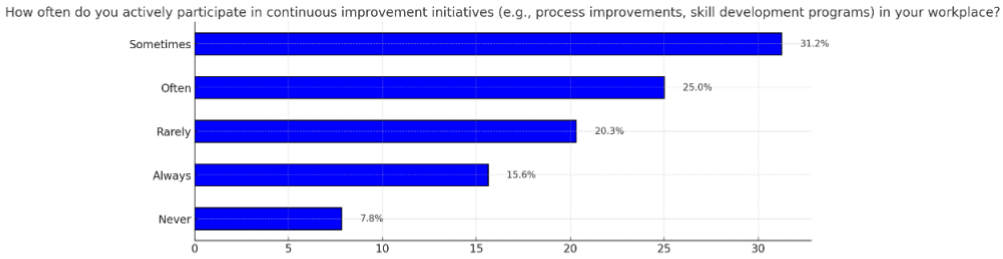

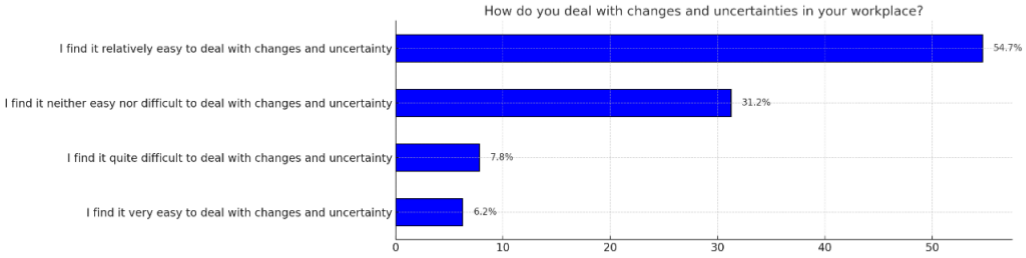

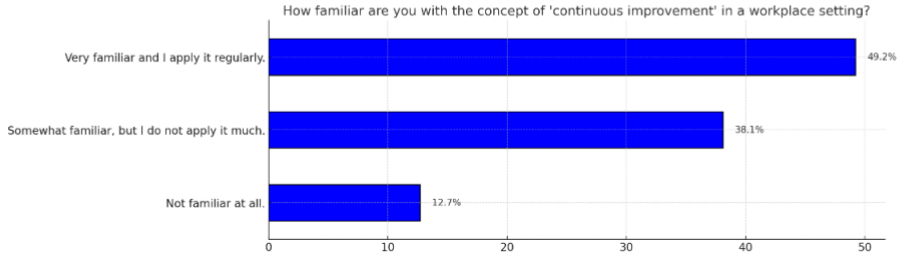

Source: Author's own, based on data from the questionnaire

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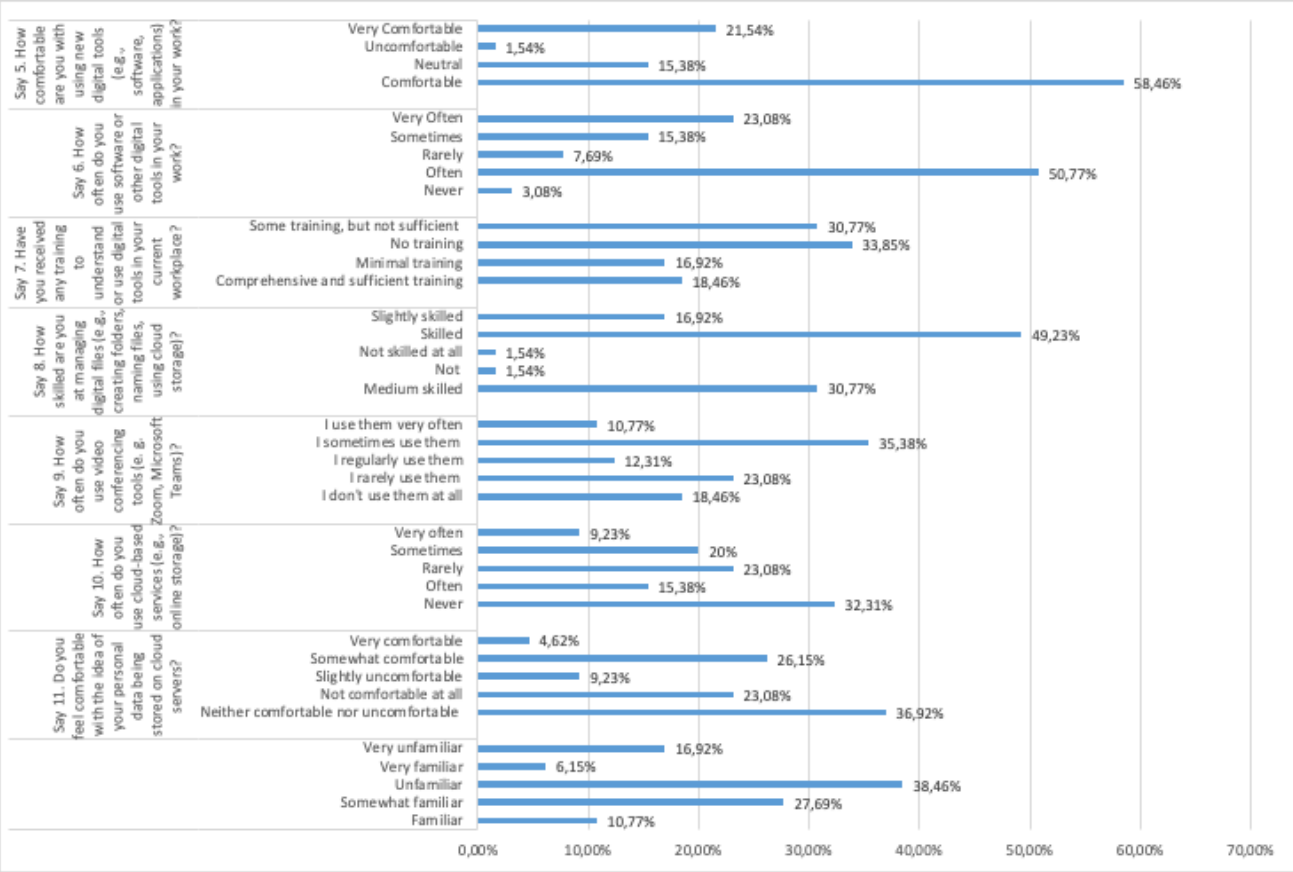
Annex 4 - Results of the survey for Türkiye

Results of the survey for Türkiye – Digital Skills



Source: Author's own, based on data from the questionnaire

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