Professional Profile
FULL REPORT

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1. INTRODUCTION

This document presents the results of Work Package 1 of the Digital upskilling of the existing ageing workforce (DIG AGE+). Its main goal is to define the skills and competencies needed by aging workforce 50+. The aim of the project DIG-AGE+ is to train and empower a novel aged workforce capable of dealing with remote working change accompanying the digital transition of companies. Promoting employment opportunities for an ageing workforce requires new thinking in the small and medium sized enterprises (SMEs).

To achieve this goal, it was necessary to identify the digital skills gaps and needs of target group and the best ways organizations use to close these gaps. Consequently, the proposal is not only based on desk research but also uses the results of a survey conducted in the countries participating in the project. Two surveys were conducted: Employee's survey and Employer's survey. The identified digital skills gaps were also discussed within focus groups in each partner country. The result from the desk research, both field researches and focus groups were used to prepare the professional profile. At the end of this document the professional profile is presented.

2. THEORETICAL BACKGROUND

Knowledge is becoming the main productive force, and lifelong education is a part of the culture of the twenty-first century. Today, the individual is exposed to constant changes, to which he must be able to adapt and follow. Adults face many problems and obstacles in their education, and in order to overcome them and get as much training as possible for life and work, they need motivation.

New technologies are completely changing the way we live and work. To thrive in today's innovation-driven economy, workers need a different mix of skills than in the past. In addition to foundational skills like literacy and numeracy, they need competencies like collaboration, creativity and problem-solving, and character qualities like persistence, curiosity and initiative. Changes in the labor market have heightened the need for all individuals, and not just a few, to have these skills.

For the smooth reintegration into the labor market are important three elements: motivation, employability and opportunities for training or employment. Older workers are less inclined to engage in education and training for work-related reasons than younger workers. While this is likely partly due to fewer incentives to engage in training opportunities given their shorter remaining working lives than other age groups, it also suggests that these workers may be unprepared and less adaptable and these could affect their job performance or potential layoffs.

A key challenge is that a large number of older workers lack the basic digital skills needed to survive in a technology-rich work environment. Addressing this challenge will require an immediate and massive increase in training opportunities for them. As digital inclusion becomes less about access to technologies and more about knowledge and skills, digital skills have been recognized as a key competence in all OECD countries (OECD, 2019). According to the predictions, share of the older workers is going to increase during the coming decades. Trends of the working age population in the EU show, that the age group 55-64 will increase, with some countries, especially the northern European ones, exceeding three-quarters (Ramovš & Svetelšek, 2020).

A recent survey by the European Commission on digital skills in the workplace found that 88% of organizations have taken no action to tackle the lack of digital skills in their employees. This is of particular concern as a lack of digital skills affects performance, with the main negative impacts being lost productivity and reduced customer numbers. In fact, research has shown that digital transformation in organizations around the world is hindered by a lack of relevant digital skills and inadequate employee training (Digital Work Research, 2018).

3. DIGITAL COMPETENCIES

The competencies are a combination of knowledge, skills and attitudes, in other words, they are composed of concepts and facts (i.e., knowledge), descriptions of skills (e.g., the ability to carry out processes) and attitudes (e.g., a disposition, a mindset to act).

Digital competence is one of the Key Competencies for Lifelong Learning. The definition of digital competence is as follows: "Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competencies related to cybersecurity), intellectual property related questions, problem solving and critical thinking." (Council Recommendation on Key Competencies for Lifelong Learning, 2018).

3.1. The DigComp framework

Reducing the mismatch between available skills and needs for the digital transformation of the economy has been a key priority at EU level over the last decade (European Union, 2017). In 2010, the European Digital Agenda recognized the need for indicators to measure the extent of digital competencies in the EU, which was implemented through the development of the Digital Competence Framework ('Dig Comp').

Figure 1: Competence areas

Source: (DIGComp Framework 2.2)

The DigComp framework identifies the key components of digital competencies in 5 areas (Dimension 1). The areas are summarized below:

1. **Information and data literacy**: To articulate information needs, to locate and retrieve digital data, information and content. To judge the relevance of the source and its content. To store, manage, and organize digital data, information and content.
2. **Communication and collaboration**: To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity.

To participate in society through public and private digital services and participatory citizenship. To manage one's digital presence, identity and reputation.

3. **Digital content creation**: To create and edit digital content To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licenses are to be applied. To know how to give understandable instructions for a computer system.

4. **Safety**: To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.

5. **Problem solving**: To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up-to-date with the digital evolution.

In Figure 2 we present the DigComp Conceptual reference model.

Figure 2: The DigComp Conceptual reference model

| Information and data literacy | 1.1. Browsing, searching and filtering data, information and digital content
1.2. Evaluating data, information and digital content
1.3. Managing data, information and digital content |

| Communication and collaboration | 2.1. Interacting through digital technologies
2.2. Sharing information and content through digital technologies
2.3. Engaging in citizenship through digital technologies
2.4. Collaborating through digital technologies
2.5. Netiquette
2.6. Managing digital identity |

| Digital content creation | 3.1. Developing digital content
3.2. Integrating and re-elaborating digital content
3.3. Copyright and licences
3.4. Programming |

| Safety | 4.1. Protecting devices
4.2. Protecting personal data and privacy
4.3. Protecting health and well-being
4.4. Protecting the environment |

| Problem solving | 5.1. Solving technical problems
5.2. Identifying needs and technological responses
5.3. Creatively using digital technologies
5.4. Identifying digital competence gaps |

Source: (DIGComp Framework 2.2)

This conceptualization has to be regarded as a generic framework (Ferrari 2013). In line with the general differentiation between domain-general and domain-specific competencies Wilbers (2019) distinguishes between four different types of digital competencies: (1) general digital competencies, (2) professional digital competencies, (3) digital competencies that are specific to the field of work and (4) digital competencies that are profession-specific. The general digital competencies are regarded as generic and span all educational sectors, like competencies described in the DigComp framework.

For the purposes of our research, we upgraded the DigComp model with The Digital Workplace Skills Framework presented in detail in the section 5.2. The competencies measured using the DigComp framework and the Digital Workplace Skills Framework are a solid base for a successful start in training programs and the acquisition of profession-specific digital competencies.

4. OFFICE CLERKS AND OTHER CLERKS

In late 2019, the gradual onset of the future of work—due in large part to automation, technology and globalization—appeared to pose the greatest risk to labor market stability (Word Economic Forum, 2020).

Office and other clerks are expected to face employment pressure and skill challenges in the following years. Data from Eurofound's 'Sixth European Working Conditions Survey' show a correlation between type of occupation and use of digital technologies. High-skilled clerical workers are more likely to use digital technologies, 49% of workers in this occupational group do so all of their working time and 36% of them do so for at least between a quarter and three quarters of their working time. Low-skilled clerical workers are less likely to use digital devices, 40% of them do so all of their working time and 26% between one quarter and three quarters of their working time.

Office clerks and other clerks are a composite group of occupations who mainly record, organize, store and retrieve information related to the office tasks and questions (CEDEFOP, 2019).

Providing qualitative and accessible training to these workers would be indispensable for their job security and development. The training should take into account these target groups. Up and reskilling programs need to focus not only on technical skills but also soft skills that could be more resilient to replacement from automatization. Around 17 million people were employed as office, accounting and support clerks in 2018. Employment and occupation decreased by 10 per cent between 2006 and 2018. Employment is projected to decrease by further 13% over the period 2018 to 2030 - a loss of more than 2 million jobs. In the workplace using ICT, being autonomous and evaluating information are the most important tasks and skills of office and other clerks.

That's why we decided that our target group for which we will prepare a professional profile and determine the needs for reskilling and upskilling will be office clerks and other clerks.

An Office Clerk is a professional who performs various tasks around an office, such as typing documents, answering phone calls and filing records. The specific duties vary depending on the employer's needs for an individual position.

Office clerks carry out a range of clerical and administrative activities related to recording, organizing, storing and retrieving information; compiling accounting, bookkeeping, financial and other numerical data; and sorting and delivering mail, filing documents, preparing information for processing, maintaining personnel records, perform a number of clerical duties in connection with money-handling operations, travel arrangements, requests for information, and appointments, etc.

The types of job undertaken by office clerks include: secretaries, typists and data entry clerks, accounting and bookkeeping clerks, payroll clerks, mail carriers and sorting clerks, scribes, filing and copying clerks, and personnel clerks, telephone switchboard operators, receptionists.

The tasks performed by clerks usually include: stenography, typing, and operating word processors; entering data into computers; carrying out secretarial duties; keeping records relating to stocks; etc.

They usually need to have completed the first-stage of secondary education but in some instances, they will need to have completed the second-stage of secondary education, perhaps by undertaking specialized vocational education and training (CEDEFOP, 2019).

Other support clerks are engaged in sorting and delivering mail, filing documents, preparing information for processing, maintaining personnel records, etc. They usually need to have completed the first-stage of secondary education but in some instances, they will need to have completed the second-stage of secondary education, perhaps by undertaking specialized vocational education and training. The tasks carried out by people in this occupation includes: recording information on the issue and return of library books; classifying and filing various documents; maintaining personnel records; performing a range of miscellaneous clerical duties. The types of job classified to this occupation includes: library clerks, personnel clerks, filing and copying clerks, etc. (CEDEFOP, 2019).

Other supported clerks are expected to suffer cut downs in all sectors, especially low and medium qualified workers. The skills required for these clerks have changed considerably in recent years due to outsourcing, specialization, technological change and globalization. Some tasks are being replaced by computers and software applications; clerks will need to strengthen the skills that are resilient to automatization (CEDEFOP, 2019).

The occupations expected to have most new job openings are researchers & engineers, technical laborers and office associate professionals. Overall, almost 9 out of 10 job openings will require medium or high-level qualifications.

5. ELABORATION PROCESS

This section explains how DIG AGE+ members developed the list of competencies included in the professional profile.

Digital skills for work and for life are at the top of the European Policy Agenda. The EU digital skills strategy and related policy initiatives have the objective of enhancing digital skills and competencies for the digital transformation. The European Skills Agenda, of 1 July 2020, supports digital skills for all, including by supporting the objectives of the Digital Education Action Plan, which has the objectives of i) enhancing digital skills and competencies for the digital transformation while ii) fostering the development of a high-performing digital education system. The Digital Compass and the European Pillar of Social Rights Action Plan set the ambitious policy targets of reaching a minimum of 80% of the population with basic digital skills and having 20 million ICT specialists by 2030.

5.1. Overall description

The proposed professional profile derives from a gap analysis that compares the desk research, employees and employers research and focus groups.

Figure 3: The Professional profile elaboration process
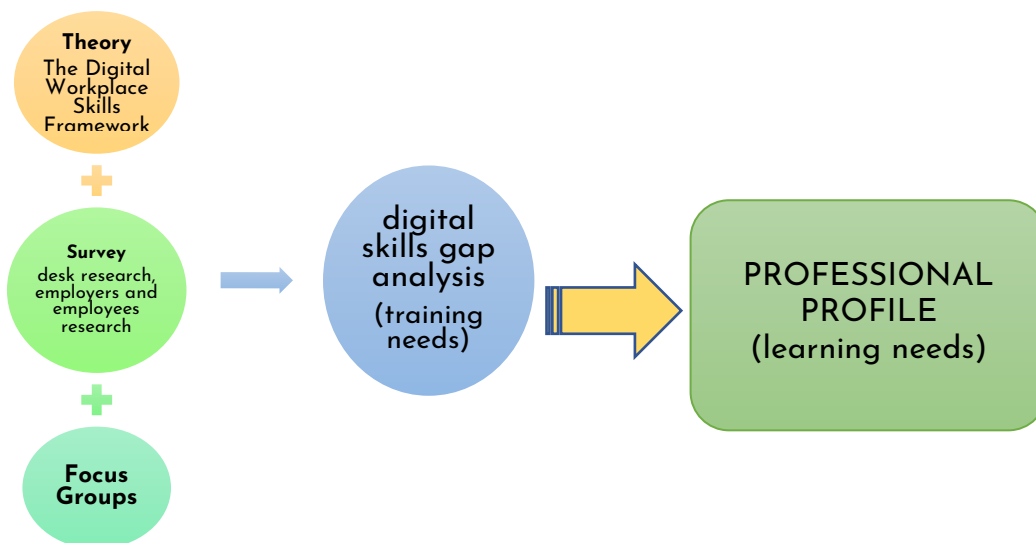
Source: (own)

The theoretical part consisted of a combined review of scientific and professional literature and statistic data conducted by the DIG AGE+ partners, which resulted in the determination of the competency framework that employees 50+ working as clerks and office clerks should possess. The discussion within the focus groups followed. The purpose of the focus group meeting was to discuss the identified digital skills, to propose solutions and to get the basis for the preparation of the professional profile. The results from all reports were the basis for the preparation of the professional profile for our target group. All outputs are presented as follows:

1. **Desk research**- the research provides information on issues related to the aging workforce in Europe and in partner countries in detail, the aging workforce index and the unemployment situations in research countries. As well the report includes the digital competence framework and ageing workforce (identification of competence gaps) and the aging workforce regulations and policy.
2. **International surveys** to determine three key digital skill gaps and activities (each partner conducted survey in their countries and a summary report for both surveys were prepared):
   a. Identifying digital competence gaps of employees 50+ (office clerks and other clerks) according to the assessment of employees and employers and identifying the key differences between the two
   b. The recognize the target groups telework specific
   c. To identified measures and their effectiveness that companies have implemented in the last year with the aim of reducing the gap between the

needs for digital competencies and the actual competence of employees (clerks and other support clerks)

3. **Focus groups:** Each project partner conducted a focus group with 3-7 professionals to validate the identified digital skills gaps and measures taken and to suggest possible additional measures and skills that have not been exposed in surveys and are important for the upskilling of our target group with the aim of increasing their employability and performance within the workplace.

The resulting professional profile is described in section 6.2. It will be validated by the project partners.

5.2. Introducing the Digital Workplace Skills Framework

The Digital Workforce Skills Assessment provides organizations with a well-considered approach to assessing the digital capabilities of its employees.

'Digital Literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyses and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process.' The definition is underpinned by a layered model which depicts technology users as advancing through three stages: digital competence (in which a range of skills are gained), digital usage (in which these skills are used in an applied setting), and finally digital transformation (in which the application of skills leads to innovation and creativity). As this definition and model suggest, becoming digitally literate involves a number of stages and elements that require the individual to engage in a process of continuous learning and adaptation over time (Digital skills, 2018).

On this basis, the Digital Workplace Skills Framework takes as its foundation a broad conceptualization of digital literacy that encompasses technical, cognitive, and socio-emotional skills. This is critical as it is not sufficient for employees simply to be able to operate a range of devices and applications, they also need to find and share information, communicate and collaborate, and constantly learn and adapt in order to achieve tasks, solve problems, be productive, and flourish in the digital workplace (ibid.).

Digital skills have been highlighted among the elements required for the workforce to operate effectively in the digital workplace. The high-level of digital literacy, on the other hand, can help to reduce cognitive load for individuals when using technology, thereby freeing them to focus on the task at hand. It can also enable them to quickly and conveniently access information, collaborate with others, and share knowledge, as well as solve problems more proficiently in technology-rich environments. In addition, digital skills can aid inclusion and well-being in the workplace as well as the management of social relationships and identities in a virtual environment.

It is worth highlighting that digitally upskilling the workforce should not be seen as an antidote for poorly conceived, designed or delivered digital workplace tools – in this respect, digital literacy is just one aspect (albeit a critical one) of a good practice program that will enable successful digital workplace transformation. With regard to digital skills interventions,

one size will most definitely not fit all. Individuals working in different roles, departments, levels of seniority or even industries and those from different demographics will need support and encouragement in different areas. The framework provides a broad view of required skills, as a starting point for organizations to hone in on what is most relevant. (Digital Work Research 2018).

5.3. EMPLOYEES' SURVEY

The research is one of the goals within the ERAZMUS+ project DIG-AGE+. The aim of the project is to train and empower older employees, 50+, so that they are able to face the changes that remote work brings with it, accompanying the digital transition of companies. Therefore, was the purpose of the employees 50+ to identify gaps in digital competencies and prepare the best training programs adapted to the needs of companies and individuals.

The target group were **office clerks and other clerks** that are a composite group of occupations who mainly record, organize, store and retrieve information related to the office tasks and questions. The characteristics of their work are in detail presented in the section 4.

The key objectives of the research were:
- To determine the differences between the existing and necessary digital competencies of employees 50+ (office clerks and other clerks)
- Identify the telework specific of the target groups since the outbreak of the Covid-19 pandemic working from home has become the norm for millions of workers in the EU. Early estimates from Eurofound (2020) suggest that close to 40% of those currently working in the EU began to telework fulltime as a result of the pandemic.

We conducted the survey among employees in five partner countries: Belgium, Finland, France, Poland and Slovenia.

Measuring instrument

As mentioned above we designed the measurement instrument as the combination of DigComp Framework and the Digital Workplace Skills Framework a tool to help organizations develop the understanding, assess current capabilities, and underpin the design of approaches to digitally upskill the workforce.
We have identified 5 basic sets of competencies:
1. Information and data literacy
2. Communication and collaboration
3. Digital content creation
4. Safety and performance
5. Problem solving

The respondents evaluated the development of digital competencies on a scale from 1 to 5 (a rating of 1 means that the competence is very poorly developed, and a rating of 5 means that the competence is very well developed), and then they assessed the needs of the department (companies, organizations) for these digital competencies, also on a scale from 1 to 5 (a grade of 1 means that the competency is not needed at all, and a grade of 5 means

that the competency is absolutely necessary). Then we were interested if respondents have experience with telework so we prepared 11 questions on their experiences from working from home, as in the last 3 years our working environment changed due to Covid-19. In the new normal still a lot of work is done from home or on a hybrid manner.

5.3.1. Research Limitations

This study has several limitations that need to be considered when interpreting the results. The main limitation of the research is a small and unrepresentative sample, so the results cannot be generalized to the entire studied population. As a result, the comparison of the needs for digital competencies by sector is also less reliable, due to the small number of respondents from companies/ organizations in individual sectors. Also, the research is limited to the employees view of the present and the need for development of digital competencies to improve employability and job retention. It is necessary to take into account that these are employees' assessments, and these assessments can also be distorted. The use of self-reports contains certain limitations regarding the validity of digital competence assessment. A major disadvantage of self-reports is that the respondents might have distorted self-perceptions. This could lead to severe overestimations of their own abilities. Hence, it can be assumed that self-reports can at least be used as an indicator for actual digital competence. In any case, it would be good to supplement future research with the perspective of employees from different working positions, where everyone would assess for themselves the extent to which they have developed individual digital competencies and what the actual needs for individual digital competencies are in their workplace.

More information is in the summary reports, there we mainly present the identified gaps in digital competencies according to employee assessments.

5.3.2. Gaps between required and actual digital competencies- employees assessment

Table 1 shows the existing and the desired digital competencies of older employees 50+, employed in the positions of clerks and other clerks. The respondents from these target group were asked to evaluate their digital competencies from two aspects: first, they assessed the level of development of digital competencies (a score of 1 means that the competence is very poorly developed, and a score of 5 that the competence is very well developed), and then they assessed these digital competencies from the aspect of the need of developing them in the next five years (a score of 1 means that the competence is not needed at all, and a score of 5 means that the competence is absolutely necessary).

The summary results are presented in table 1.

Table 1: Digital competencies gaps- employee assessment

Digital competencies / statistical values	PRESENT DIGITAL COMPETENCIES (situation assessment)			DIGITAL COMPETENCE NEEDS IN 5 YEARS (needs assessment)			Sig. (2-tailed)
	n	M	SD	n	M	SD	
Information and data literacy	**183**	**3,52**	**1,07**	**182**	**3,33**	**1,23**	
I am able to search for and access data, information and digital content.	183	3,88	0,91	185	3,47	1,18	0.262
I am able to organize, store and retrieve data, information and content in a digital environment.	182	3,29	1,2	181	3,35	1,34	0.118
I am able to analyze, compare and critically evaluate sources and types of data, information and digital content.	183	3,38	1,1	181	3,17	1,17	0.000
Communication and collaboration	**179**	**3,43**	**1,17**	**183**	**3,48**	**1,22**	
I am able to communicate and collaborate using email and social networking sites (e.g., Facebook, LinkedIn).	183	3,62	1,13	181	3,45	1,22	0.377
I am able to communicate and collaborate using a variety of digital technologies (e.g. MS Teams, Skype, Zoom, GoTo Meeting).	183	3,45	1,11	184	3,81	1,03	0.118
I am able to share data, information and digital content with others using appropriate digital technologies (eg OneDrive, WeTransfer).	183	3,43	1,09	184	3,35	1,31	0.000

It's hard to assemble information from different sources into a coherent whole.	174	3,42	1,15	184	3,53	1,12	0.599
I understand the options available to me to communicate in the digital workplace, and when to use each one (e.g. email, instant messaging, discussion post).	174	3,23	1,36	184	3,26	1,41	0.033
Digital content creation	**183**	**3,44**	**0,97**	**43**	**3,65**	**1,05**	
I am able to create simpler digital content in various formats (eg document in MS Word, spreadsheets and graphs in MS Excel, presentations in MS PowerPoint).	183	3,74	1,03	184	3,38	1,20	0.000
I am able to create more complex digital content in various formats (eg infographics, more complex presentations, simulations, videos and other multimedia content).	183	2,46	1,21	184	2,90	1,40	1.000
I'm comfortable using instant messaging for informal communication with colleagues.	183	3,65	1,04	184	3,73	1,20	0.538
I know how to manage my email inbox without feeling overwhelmed.	183	4,00	1,05	184	3,47	1,34	0.212
If I find a digital workplace tool frustrating I tend to try to avoid it.	183	3,49	1,19	184	3,51	1,20	0.060
It is easy for me to find help (e.g. 'how to' guides, support desk) on using digital workplace tools.	183	3,49	1,13	184	3,31	1,09	0.000
SAFETY AND PERFORMANCE	**179**	**3,37**	**1,11**	**184**	**3,37**	**1,15**	
I am familiar with the kind of risks that can arise online (e.g. bullying, data theft, spam) and how to manage them.	183	3,78	0,94	184	3,62	1,14	0.027
Using non-mandated tools (e.g. Google Docs, Dropbox) is a practice that puts the organization at considerable risk.	181	3,39	1,10	184	3,40	1,19	0.006
It is unclear to me where in the digital workplace I should/shouldn't share client information.	180	2,82	1,23	184	3,06	1,18	0.800

|							
I am able to identify the information I need in the digital workplace to do my job.	180	3,75	1,02	184	3,51	1,24	0.058
Finding the information I need to do my job involves a lot of wasted time.	180	3,18	1,10	184	3,35	1,05	0.000
I'm comfortable interpreting information from a range of formats (e.g. content pages, videos, infographics, presentations).	180	3,09	1,20	185	3,24	1,22	0.000
I always assess external resources (e.g. news items, documents) to make sure they are valid and trustworthy.	174	3,71	1,04	184	3,36	1,12	0.001
I regularly extend my knowledge about topics that are important to me using information I find in the digital workplace.	174	3,24	1,22	184	3,42	1,05	0.010
PROBLEM SOLVING	**178**	**3,31**	**1,18**	**184**	**3,37**	**1,26**	
I regularly share information and ideas in the digital workplace.	174	3,46	1,05	184	3,10	1,27	0.000
Checking my messages before I send them (e.g. for mistakes) is standard practice for me.	180	3,20	1,52	184	3,92	1,16	0.003
I regularly participate in learning opportunities in the digital workplace (e.g. e-learning, webinars, discussions	178	3,20	1,03	184	3,07	1,44	0.000
I am confident in providing mentoring and coaching for colleagues on how to get the most out of the digital workplace	178	3,38	1,12	184	3,40	1,17	0.003

Source: (own)

In the Table 1, the competencies in which a medium gap between the estimated current and competencies needed in 5 years can be detected are marked in yellow, while the competencies in which the largest gaps can be observed are marked in red. If we look at the data in the Table 1, we can see that, in general, employees rate their present digital competencies very high, and what is particularly interesting, they estimate that some competencies that are very important today for performing their work will be less important in the future. Thus, the perceived gap is that currently developed competencies are high and will be less important in the future in the area of information and data literacy, while the importance of competencies belonging to the safety and performance group remains at the same level

Based on the results in the Table 1, we can conclude that, according to the employees' assessment, it would be necessary to strengthen and upgrade the key competencies related to **digital content creation** (in the direction of creation more complex digital content in various formats), **communication and collaboration** and **problem solving**. In the area of **problem solving**, a large gap was detected in the competence "**Checking my messages before I send them (e.g., for mistakes) is standard practice for me**". This means that it would be necessary to improve security in the area of due diligence of employees to check messages before sending, and it is also necessary to train employees so such behavior becomes standard work practice. The same applies to the thematic set of **digital content creation**, where the greatest emphasis must be placed on developing the **ability to create more complex digital content in various formats** (e.g., infographics, more complex presentations, simulations, videos and other multimedia content).

Above all, the ability to **communicate and collaborate** using **various digital technologies (e.g., MS Teams, Skype, Zoom, GoTo Meeting)** should be upgraded and strengthened.

The Figure 5 presents the identified digital skills gap according to competence areas.

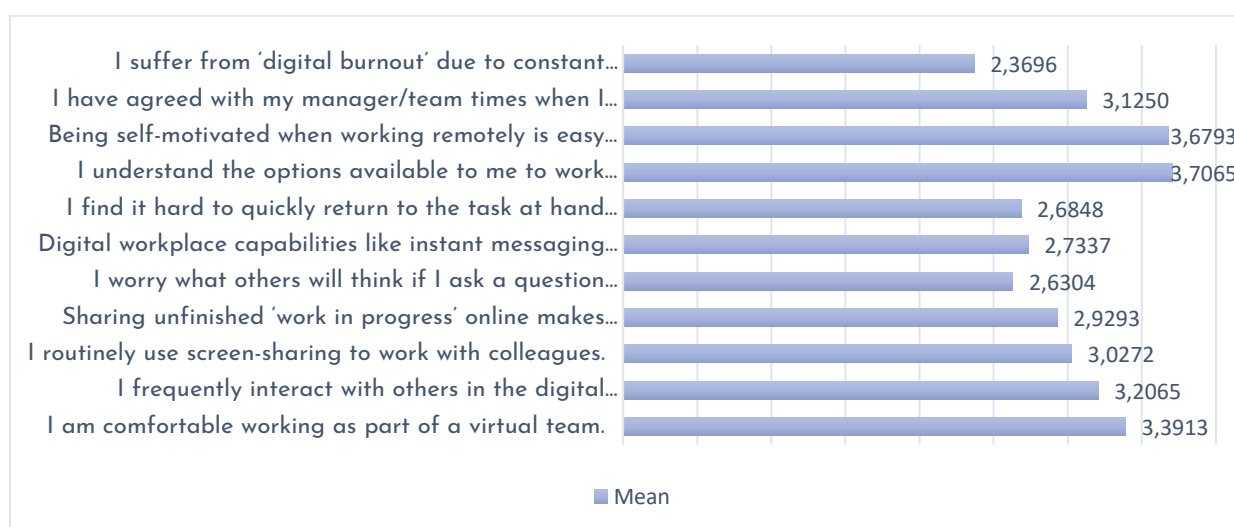Figure 5: Digital skills gap - employees
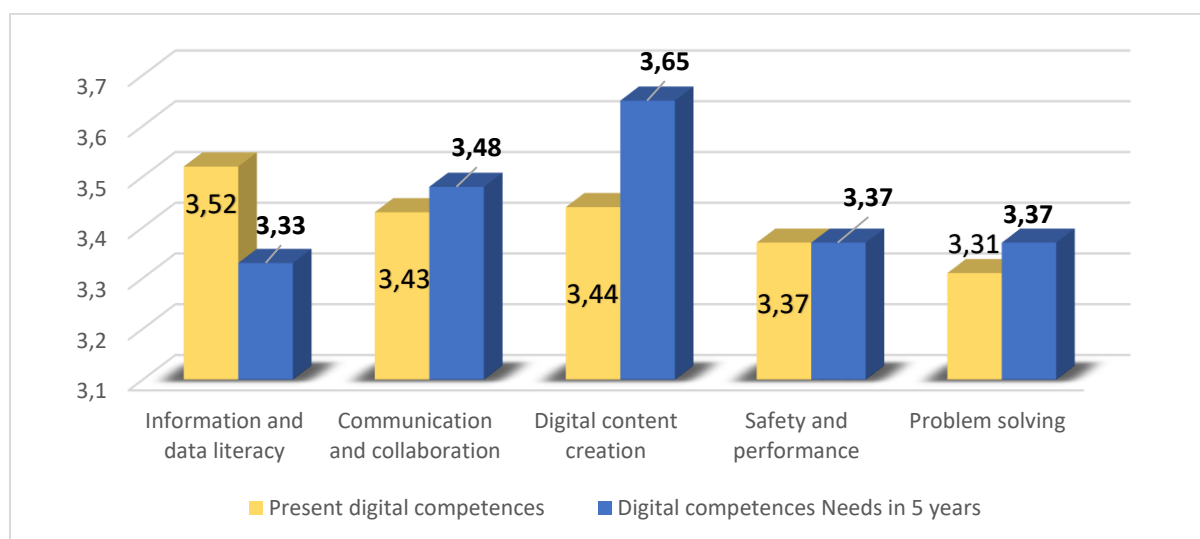
Source: (own)

The respondents estimate that digital skills related to information and data literacy will be slightly less important in five years, and it will be more necessary to develop competencies in the areas such as communication and collaboration, digital content creation and problem solving. Competencies in the area safety and performance are estimated to be at the same level in next 5 years.

On average, employees rate their current competencies very highly, and there is also no perceived need for the development of specific competencies that will be needed in the next 5 years. Although it is still necessary to emphasize that there only one big gap recognized by the respondents regarding current competencies and competencies needed in 5 years.

Next important topic we have researched was the telework. In its recent communication on the 2020 country-specific recommendations the Commission highlights the important role of telework in preserving jobs and production in the context of the Covid-19 crisis. Against this backdrop, this brief discusses the challenges that countries, employers and workers are facing in adapting to the new work-from-home environment, on the basis of pre-outbreak trends in the prevalence of telework across EU countries, sectors and occupations. According to the European framework agreement on telework, is teleworking: 'a form of organizing and/or performing work, using information technology, in the context of an employment contract/relationship, where work that could be performed at the employer's premises is carried out away from those premises on a regular basis.' (EUROFOUND, 2022). The characteristic feature of telework is the use of computers and telecommunication to change the usual location of work.

The pandemic has shown that a new hybrid way of working is possible at a greater scale than could be imaged in previous years, yet business leaders remain uncertain about the productivity outcomes of the shift to remote or hybrid work (ibid.). Therefore we asked respondents to answer the questions in the connection with telework (score 1 means that you do not agree, score 5 means that you totally agree).

Figure 6: Telework

Statement	Mean
I suffer from 'digital burnout' due to constant…	2,3696
I have agreed with my manager/team times when I…	3,1250
Being self-motivated when working remotely is easy…	3,6793
I understand the options available to me to work…	3,7065
I find it hard to quickly return to the task at hand…	2,6848
Digital workplace capabilities like instant messaging…	2,7337
I worry what others will think if I ask a question…	2,6304
Sharing unfinished 'work in progress' online makes…	2,9293
I routinely use screen-sharing to work with colleagues.	3,0272
I frequently interact with others in the digital…	3,2065
I am comfortable working as part of a virtual team.	3,3913

Source: (own)

The Figure 6 shows that when working from home, employees understand the options available to them to work outside of the office (e.g. flexible working options, digital workplace tools), that it is easy for them to be self – motivated and they feel comfortable working as a part of a virtual team.

Ultimately, the spread of telework in the longer-term will depend on a broad range of factors, including its effect on productivity and working conditions, as well as its contribution to broader policy objectives such as Europe's digital and green transitions. Milasi and co-authors suggests that people working from home can sustain, or even enhance, their productivity, while enjoying a better work-life balance.

5.3.3. Discussion and key findings

As it follows from the results shown above, the research shows significant discrepancies between the existing and the needed digital competencies of employees 50+ who are employed in the positions of clerks and other clerks.

There are no significant differences between countries regarding the needs for the development of competencies in the next 5 years according to the assessment of employees. The only country where almost all competencies are rated higher now than in the next 5 years, is Finland. In other countries employees perceive the need for the development of digital competencies in the areas: of communication and collaboration, problem solving and digital content creation. It is necessary to take into account the digital competencies need when designing future training programs.

The research showed that the ability to communicate and collaborate using various digital technologies and the ability to share data, information and digital content with others using suitable digital technologies should be upgraded and strengthened in the case of older employees.

Based on the results of the analysis, we can conclude that it is necessary to deepen trainings to strengthen competencies in the following areas:
- Creation of more complex digital content in various formats
- Improving using instant messaging for informal communication with colleagues
- Train employees for better communication and digital use of technologies (e.g. MS Teams, Skype, Zoom, GoTo Meeting).
- Train employees to be able to share data, information and digital content with others using appropriate digital technologies (e.g. OneDrive, WeTransfer).
- Train employees so that it becomes a constant practice to check messages up-to-date before forwarding them on.

5.4. EMPLOYERS' SURVEY

Digital transformation is changing the world of work (Frey and Osborne 2017). The increasing use of technology affects organizational structures as well as communication and collaboration processes and fosters a trend towards knowledge-based work activities (Van Laar et al.2017). There is an increasing need for interdisciplinary skills (e.g., problem solving, creativity, critical thinking, learning skills and for digital competencies (Findeisen and Wild, 2022).

According to the predictions, share of the older workers is going to increase during the coming decades. Trends of the working age population in the EU show, that the age group 55-64 will increase, with some countries, especially the northern ones, exceeding three-quarters (Ramovš & Svetelšek, 2020). The European workforce will be older than ever. In many countries, the proportion of older workers will rise to 30% or more of the working population (Ilmarinen, 2012).

Training older workers is a precondition for raising the average working age and ensuring their success; research reports of good practices on this topic from a wide variety of companies around the developed world have been on the agenda for years (IBM, 2005)

Full involvement in the processes within the digital society requires individuals to master a whole range of new abilities and skills based on knowledge of modern ICT. Acquiring e-skills for the effective use of ICT is an important element of the development of an inclusive digital society, therefore it is necessary to follow the realization of two of the strategic goals, namely 1) Improvement of e-competencies and e-skills of the population and 2) Improvement of e-skills for the use of ICT for new digital jobs.

In the near future, 90% of jobs (especially engineering, medicine, art and architecture) will require some level of digital skills (Digital Skills and Jobs Coalition, European Commission, 2013). A recent survey by the European Commission on digital skills in the workplace found that 88% of organizations have taken no action to tackle the lack of digital skills in their employees. This is of particular concern as a lack of digital skills affects performance, with the main negative impacts being lost productivity and reduced customer numbers. In fact, research has shown that digital transformation in organizations around the world is hindered by a lack of relevant digital skills and inadequate employee training (Digital Work Research, 2018).

The fact is that the lack of digital competencies in the integration into the labor market, including employees, is a major obstacle to the further process of technological modernization of companies and thus the economic development of the country. The European Commission found that two fifths of the workforce in the EU lack digital skills (European Union, 2017). Digitization has a major impact especially on socially vulnerable groups, such as older employees.

The gap between the use and need for digital competencies increases the digital divide or gap, which indicates that people with certain demographic and socio-economic characteristics are at a disadvantage in accessing and using the Internet compared to other groups (van Deursen and Helsper, 2015; Delello and McWhorter, 2017; Hodge et al., 2017). The reality is that the constant development of ICT brings with it the need for people to

acquire ever higher levels of digital literacy in order to maintain their sense of inclusion. Digital literacy is a set of skills related to the use of ICT that each individual must develop in order to function in a digital society (Friemel, 2016; Van Deursen et al., 2016). Thus, we can say that digital competence is a fundamental element of the development of every individual, as it enables their integration into today's society in a more participatory way.

For the expected benefits, such as increased productivity, accelerated innovation and increased employee satisfaction, it is essential that individuals adopt and use them in a predictable manner. This includes a range of elements, from ensuring strategic alignment and strong governance to investing in good user experience design and ongoing change management. It has also been shown that the digital literacy of the workforce can contribute to the successful adoption of technologies. Thus, organizations need to invest not only in technologies, but also in people and skills that enable the workforce to use them optimally, thereby enabling what Soule and co-authors (2016) described as 'digital prowess' or the ability of the organization as a whole to move quickly and take advantage of new digital opportunities.

5.4.1. Purpose and objective of research

With the aim of finding out where the biggest gaps are, which are assessed by employers in relation to the actual situation and the needs of employers, we made a quantitative survey with the aim of analyzing the digital skills required by employers from the point of view of the industry and profession, including the analysis of the most common gaps in digital skills with employers. In the research, we focused on the office clerks and other clerks that are a composite group of occupations who mainly record, organize, store and retrieve information related to the office tasks and questions.

The objectives of research were:
- To determine the difference between the existing and necessary digital competencies of employees 50+ (office clerks and other clerks) from the perspective of leaders, HRM

- To identify the measures that companies have implemented in the last year with the aim of reducing the gap between the needs for digital competencies and the actual competence of employees (clerks and other support clerks)

- To identify the effectiveness of the measures taken to reduce the digital skills gap of employees 50+.

The purpose of research was to identify gaps in digital competencies and prepare the best training programs adapted to the needs of companies and individuals. The respondents were **m**anagers, leaders, owners, human resource managers, responsible for education or HR development in companies We conducted the survey among employees in five partner countries: Belgium, France, Poland, Finland and Slovenia. A total number of respondents was 207. The majority of respondents were from Slovenia and Poland (64%).

The respondents- employers rated the development of digital competencies on a scale from 1 to 5 (a rating of 1 means that the competence is very poorly developed, and a rating of 5 means that the competence is very well developed), and then they assessed the needs of the department (companies, organizations) for these digital competencies, also on a scale from

1 to 5 (a rating of 1 means that the competence is not needed at all, and a rating of 5 means that the competence is absolutely necessary).

Then we were interested what measures were implemented in the department (company, organization) in the last year to close the gap between the needs for digital competencies and the actual qualifications of employees 50+ employed as office clerks and other clerks. Since motivation is a very important factor in the success of training, we also checked how often, on average, employees participate in education and training (either at the workplace or outside the workplace) for the needs of (better) work performance. In this question, the respondents answered only for those groups of employees who are their superiors.

The last question was related to the assessment of the effectiveness of measures taken by employers to reduce the digital skills gap of employees 50+. The employees rated the effectiveness of measures implemented on a scale: very effective, effective, somewhat effective, ineffective, not at all effective. Only one answer was possible for each step.

5.4.2. Research Limitations

The main limitation of the research is a small and unrepresentative sample. Also, the research is limited to the managers view of the development and needs of digital competencies among their subordinates and their readiness for training. It is necessary to take into account that these are managers assessments, and these assessments can also be distorted, especially in those cases when leaders had to give a general assessment for a large number of their subordinates (it is easier to give a more realistic assessment for a smaller number than for greater number of subordinates).

5.4.3. Digital competence gaps – employers' assessment

In Table 2 the data show the big and medium gaps between the present digital competencies and the need for the development of digital competencies of employees 50+ in the future. In the Table 2 the competencies in which the largest gaps can be observed are marked in red, with yellow color are marked the middle gaps.

Table 2: Digital competence gaps- employers assessment

	PRESENT DIGITAL COMPETENCIES OF EMPLOYEES 50+ (situation assessment)			DIGITAL COMPETENCE NEEDS IN 5 YEARS OF EMPLOYEES 50+ (needs assessment)			Sig. (2-tailed)
	N	**Mean**	**Std. Deviation**	**N**	**Mean**	**Std. Deviation**	
INFORMATION AND DATA LITERACY	**195**	**3,28**	**0,918**	**195**	**3,48**	**1,275**	**0,000**
Ability to search for and access data, information and digital content.	195	3,36	0,900	195	3,36	1,412	0,000
Ability to organize, store and retrieve data, information and content in a digital environment.	195	3,44	0,936	195	3,62	1,284	0,003
Ability to analyze, compare and critically evaluate sources and types of data, information and digital content.	195	3,03	0,919	195	3,47	1,127	0,000
COMMUNICATION AND COLLABORATION	**195**	**3,48**	**1,015**	**195**	**3,91**	**1,004**	**0,012**
Ability to communicate and collaborate using email and social networking sites (e.g., Facebook, LinkedIn).	195	3,72	0,966	195	4,03	0,908	0,042

Ability to communicate and collaborate using a variety of digital technologies (e.g., MS Teams, Skype, Zoom, GoTo Meeting).	195	3,27	0,981	195	3,70	1,200	0,065
Ability to share data, information and digital content with others using appropriate digital technologies (e.g., OneDrive, WeTransfer).	195	3,45	1,099	195	3,99	0,905	0,011
DIGITAL CONTENT CREATION	**195,00**	**3,02**	**1,2021**	**195,00**	**3,10**	**1,200**	**0,000**
Ability to create simpler digital content in various formats (e.g., document in MS Word, spreadsheets and graphs in MS Excel, presentations in MS PowerPoint).	195	3,59	0,911	195	3,55	1,171	0,000
Ability to create more complex digital content in various formats (e.g., infographics, more complex presentations, simulations, videos and other multimedia content).	195	3,04	1,274	195	3,34	1,214	0,000
Ability to program and develop software.	195	2,44	1,422	195	2,39	1,215	0,000
SECURITY AND OPERATIONS	**195**	**3,22**	**1,075**	**195**	**3,52**	**1,253**	**0,000**
Understanding of risks and threats and knowledge of preventive security measures in the digital environment.	195	3,31	1,069	195	3,86	1,267	0,612

|							
Ability to protect personal data and protect privacy in the digital environment.	195	3,34	1,025	195	3,63	1,369	0,000
Ability to protect oneself and others from potential threats in the digital environment (e.g., online blackmail / harassment).	195	3,39	1,061	195	3,71	1,144	0,000
Ability to work and operate high-tech devices.	195	2,83	1,144	195	2,88	1,232	0,000
PROBLEM SOLVING	**195**	**3,07**	**1,106**	**195**	**3,69**	**0,988**	**0,000**
Ability to identify and solve technical problems in device management and / or in the use of digital environments.	195	3,32	1,180	195	3,76	1,023	0,000
Ability to use digital tools to innovate processes, services and products.	195	2,62	1,074	195	3,49	1,027	0,000
Identifying one's own digital skills gaps and finding opportunities for development and learning.	195	3,28	1,064	195	3,83	0,912	0,000

Source: (own)

If we look at the data in table 2, we can see that, in general, employers' asses' big gaps in the whole competence area problem solving and in the area security and operation the competence "Understanding of risks and threats and knowledge of preventive security measures in the digital environment." and middle gaps in the area communication and collaboration. The big gap was identified within area communication and collaboration in the competence "Ability to share data, information and digital content with others using appropriate digital technologies (e.g., OneDrive, WeTransfer).".

The results pointed out that it would be necessary to strengthen and upgrade all digital competencies. Special focus should be done to the competencies related to area problem solving where big gaps were identified and also the area communication and collaboration. Big competencies were detected also in the area security and operations where we have to be strengthened the understanding of risks and threats and knowledge of preventive security measures in the digital environment; in the area communication and collaboration the ability to communicate and collaborate using various digital technologies (e.g., MS Teams, Skype, Zoom, GoTo Meeting) should be upgraded and strengthened.

The medium gap was identified in the area of information and data literacy, the need to develop the ability of employees to analyze, compare and critically evaluate sources and types of data, information and digital content.

In the Figure 7 the differences between individual sets of digital competencies are presented.

Figure 7: Digital skills gaps- employers
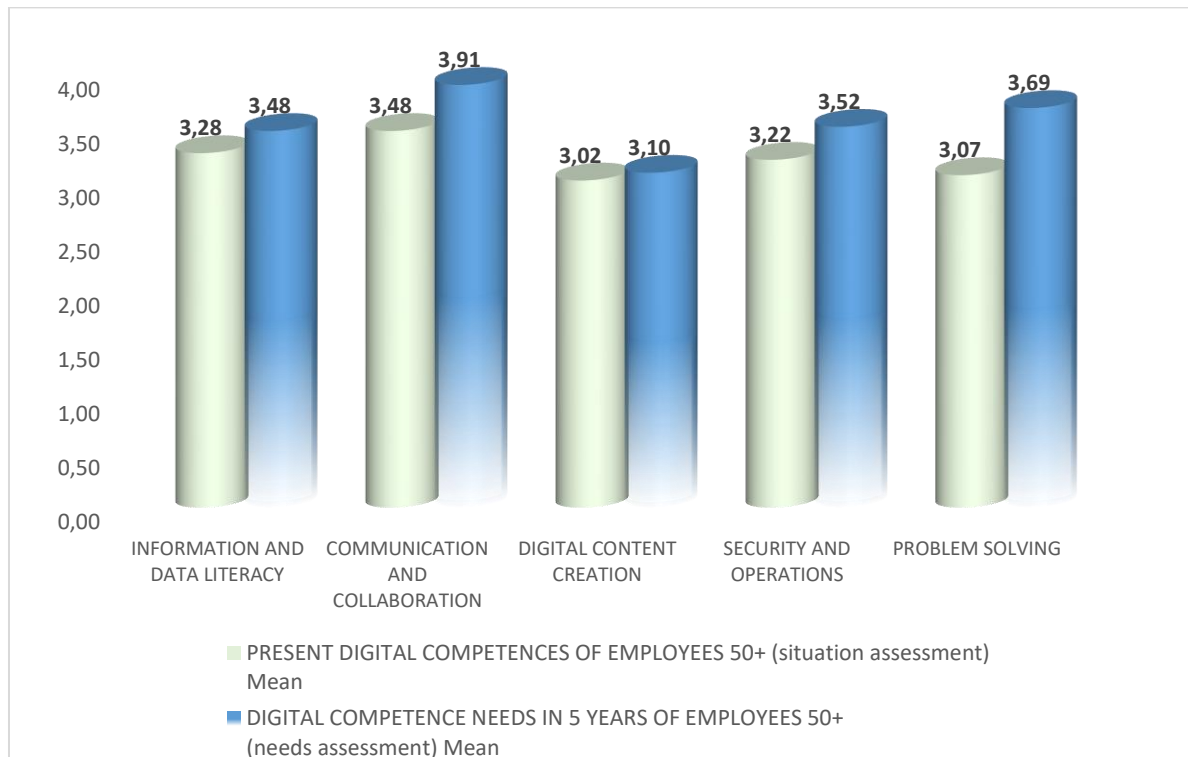
Source: (own)

Summary data present that employers estimate that employees 50+ have to improve all their digital competencies, which they will need to perform in their work in the future, e.g., in

5 years. Employers estimate that the greatest need for improving digital skills is related to problem solving and communication and collaboration.

Based on the results of the analysis, we can conclude that it is necessary to deepen trainings to strengthen competencies in the following areas:
- information and data literacy as the employees should upgrade their competence to analyze, compare and critically evaluate sources and types of data, information and digital content
- Understanding the risks and threats and knowledge of preventive security measures in the digital environment.
- Improving using instant messaging for informal communication with colleagues
- Train employees for better communication and collaboration use of digital technologies (e.g. MS Teams, Skype, Zoom, GoTo Meeting) and also email and social networking sites (e.g., Facebook, LinkedIn).
- Train employees to be able to share data, information and digital content with others using appropriate digital technologies (e.g. OneDrive, WeTransfer).
- Train employees so to upskill their competencies in the area problem solving such as (identifying and solving technical problems in device management and / or in the use of digital environments,. identifying one's own digital skills gaps and finding opportunities for development and learning and the ability to use digital tools to innovate processes, services and products).

Identifying one's own digital skills gaps and finding opportunities for development and learning in addition to the already listed digital competencies, we determined which other digital competencies the studied target groups of employees additionally need according to their managers.

Based on the results, we can conclude that, according to employers, office clerks and other clerks need additional skills in order to perform their work competently. Thus, the respondents believe that employees 50+ at the workplaces office clerks and clerks would need additional digital skills in the fields:
• Cybersecurity and data protection,

• Doodle questionnaire,

• Excel - demanding,

• Programming, 3D drawing,

• Connectivity between applications (formats, back-up, auto sync…),

• Understanding the options offered by a modern information system

• The ability to recode disinformation, the ability to create accessible documents

• Learning the advanced usage of new software.

The respondents from Finland added that employers also require an open attitude towards constant digital change in the workplace. The employees must also have curiosity, interest and willingness for change.

Measures to reduce the gap between the existing and necessary competencies

We asked the respondents (managers) to answer the question " What measures have you taken in your department (company, organization) in the last year to close the gap between the needs for digital competencies and the actual qualifications of employees?", with the aim of identifying key measures that are implemented by companies to reduce the gap between existing and required competencies. The answers are shown in Figure 8.

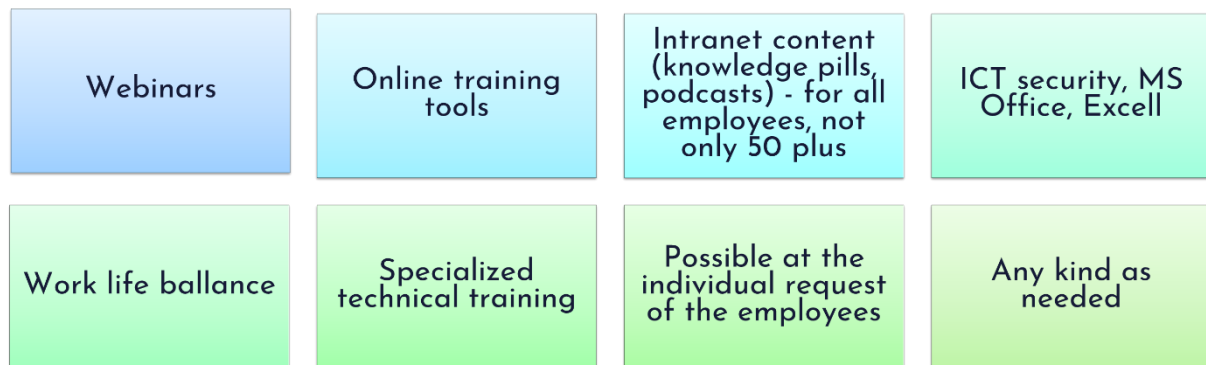Figure 8: Measures taken to close the gap- summary
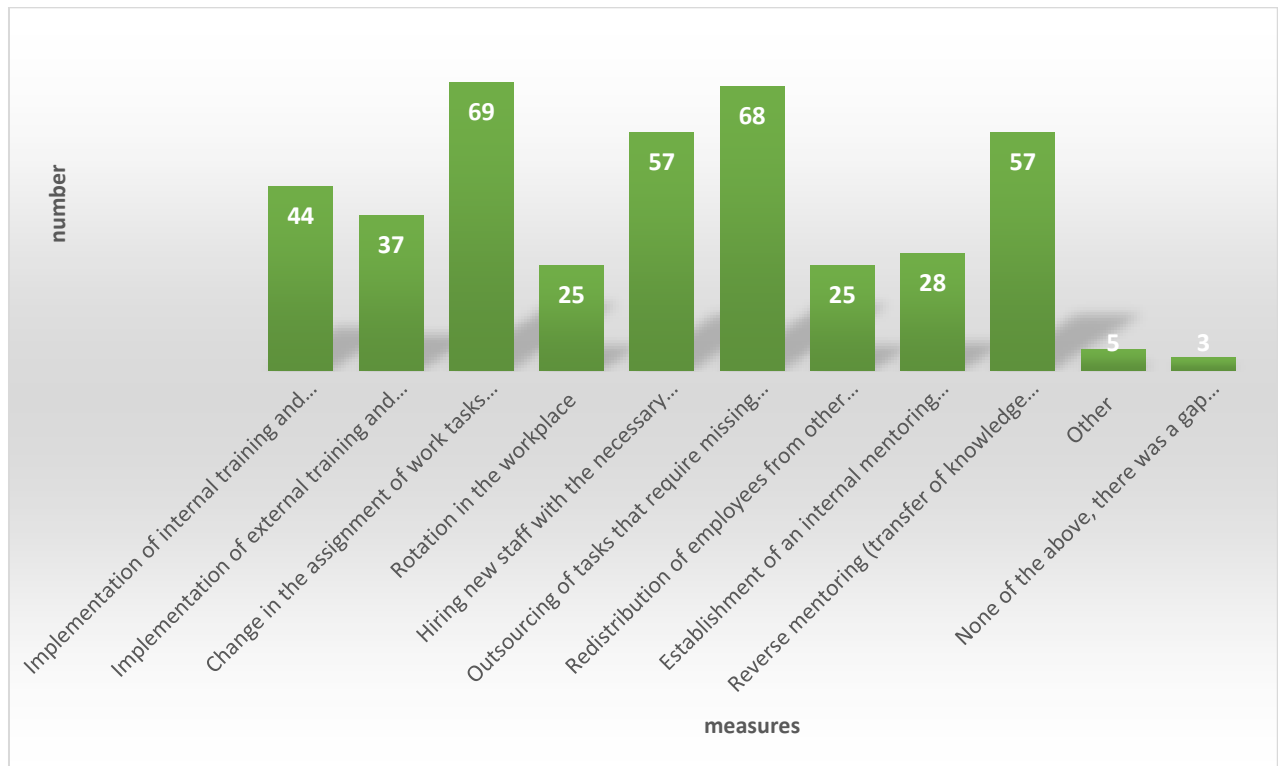
Source: (own)

The respondents answered that in the past year, the measure of changing the assignment of work tasks according to the individual's competencies was the most used measure, and the outsourcing of tasks that require missing competencies was often used as a measure.

14% of companies used reverse mentoring as a method to reduce the gaps in digital competencies. They performed internal and external training programs with different topics:

Internal training and development programs:

IT (ERP, Dashboards, SF, digitalization of processes)	CYBER & COMPUTER SECURITY	EXCELL, WORD, MS Office tools	Project management
Mentoring	On the job training (learning by doing)	Cross project teams	Employee support

External training and development programs

Webinars	Online training tools	Intranet content (knowledge pills, podcasts) - for all employees, not only 50 plus	ICT security, MS Office, Excell
Work life ballance	Specialized technical training	Possible at the individual request of the employees	Any kind as needed

The respondents assessed that the best measures taken were different training programs tailored specifically for the 50+ target group, which were aimed at strengthening digital skills (employers in all countries think so).

In the survey, we asked the respondents to evaluate the effectiveness of the measures taken to reduce the digital gap in the competencies of employees 50+. The measures were evaluated on a scale from 1 to 5, where 5 meant very effective measures, 4 effective, 3 somewhat effective, 2 ineffective, and 1 not at all effective measures. The results are shown in Figures 9.

Figure 9: Effectiveness of measures
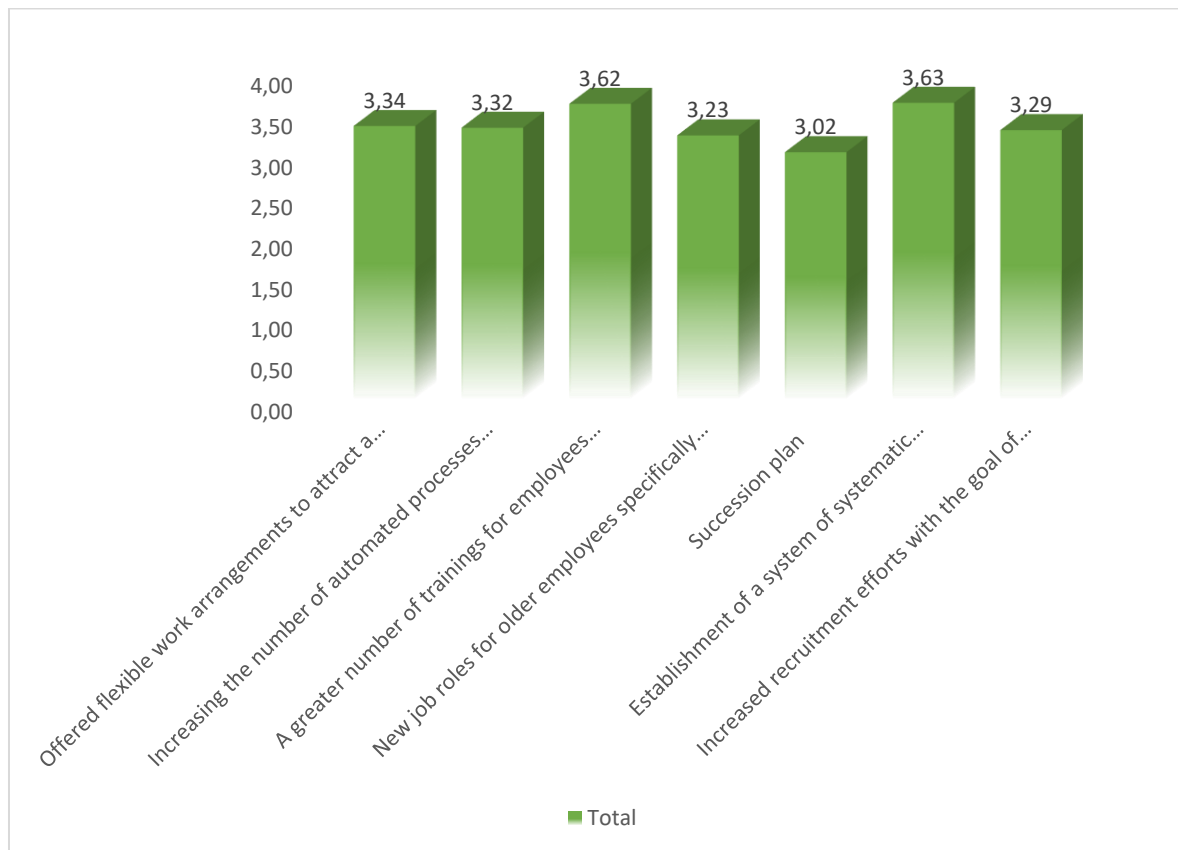
Source: (own)

The data in Figure 9 show that the most effective measures are »establishing of a system of systematic preservation of tacit knowledge - institutional memory/ organizational knowledge of employees before retirement and« and »A greater number of trainings for employees 50+ with the aim of improving digital competencies«.

Table 3: Best measures by country

	BELGIUM	SLOVENE	FRANCE	POLAND	FINLAD
Offered flexible work arrangements to attract a broader range of applicants (e.g., job-sharing, telework)	2,52	3,29	3,42	3,82	3,67
Increasing the number of automated processes (e.g., implementing robotics)	3,21	3,25	3,00	2,82	4,33
A greater number of trainings for employees 50+ with the aim of improving digital competencies	3,59	3,41	4,17	3,91	3
New job roles for older employees specifically designed to bridge skills or knowledge gaps	2,48	3,31	3,67	3,02	3,67
Succession plan	2,28	3,48	3,04	2,65	3,67
Establishment of a system of systematic preservation of tacit knowledge - institutional memory/ organizational knowledge of employees before retirement	3,59	3,35	3,54	3,67	4,00
Increased recruitment efforts with the goal of replacing retired employees	2,79	3,36	3,83	3,28	3,2

Source: (own)

In Poland, employers highlighted the flexibility of work arrangements, in France - increased recruitment efforts, in Slovenia there are also succession plans, and in Belgium the establishment of a tacit knowledge preservation system and in Finland - Increasing the number of automated processes (e.g., implementing robotics).

As it can be seen from the results the research shows significant discrepancies between existing and required digital competencies.

Because the digital skills gap widens faster than new employees enter the job market, employers should not expect to be able to simply hire new employees and this will be their way out of the problem. Already more than half of office workers need training and digital reskilling to remain effective in their current roles. Employers must look for long-term solutions in training options and the development of a workplace culture of continuing education.

The respondents also estimated that the most effective measures used to reduce the gap between the digital competencies of employees 50+ are primarily "establishing a system of systematic preservation of tacit knowledge - institutional memory/ organizational knowledge of employees before retirement" and "A greater number of trainings for employees 50+ with the aim of improving digital competencies".

Differences appear between the countries included in the research, especially in the identification of gaps in digital competencies, as in some countries (Finland, France and Belgium) employers (managers) estimate that the need for competence development will be lower than there is current state of present competence. However, with the development of digitization and Industry 5.0, new competencies will certainly appear that employees will have to acquire in order to perform their work smoothly.

Recent trends in the workplace – some spurred by pandemic adaptations and others by the increased scalability of advanced digital services in cloud environments – have already placed the demand for digital skill sets far ahead of current capabilities in the workforce. If current trends hold, this gap will broaden in the coming decade, and businesses unable or unwilling to address the digital skills gap will find it harder to perform competitively.

Developing and enhancing human skills and capabilities through education, learning and meaningful work are key drivers of economic success. To capture the opportunities created by technologies, many companies across the private sector have embarked on a reorientation of their strategic direction. By 2025, the capabilities of machines and algorithms will be more broadly employed than in previous years, and the work hours performed by machines will match the time spent working by human beings. The augmentation of work will disrupt the employment

Organizations can use two primary paths to build employees' skills and close the skills gap: upskilling, which utilizes learning and development programs to build on existing skill sets, and reskilling, which imparts entirely new skills to help employees shift into a different role.

5.5. Focus groups

The focus group method is a qualitative method for research, which is used to discover relationships between participants, their opinions and views regarding a certain topic. In our case, the aim of the focus groups is to discover digital skill gaps and to prepare the input for the preparation of Professional profile with special emphasis on
  a) best practices for effective upskilling of digital competencies of aging workforce aged 50+ and
  b) areas in which future projects can be implemented.

The focus groups were prepared and performed in each partner country. A separate report was prepared for each focus group, and we have also prepared a summary report that includes the common findings of the conducted focus groups.

General methodology for setting up and conducting focus groups

The focus group were led by a representative of each project partner in each country based on a program that foresees a series of question. An observer (another representative of the project partner) was also present at the meetings with the aim to analyze the relationships in the focus group. The focus groups meetings last about two hours.
The purpose of the focus group meeting was to discuss with the focus groups participants the identified digital skill gaps and to propose solutions, to get the basis for the preparation of the professional profile. We prepared the invitation for each of the participants.

Focus group participants

Minimal number of participants in focus groups was **5**. The focus groups were organized in a form of open dialog facilitated by the Project Managers in the partner countries.
At least one representative of the following stakeholders should be present in each group:
  ● **European SMEs employing aged workforce (50+)**
  ● **Higher education institutions**
  ● **Adult learning centers**
  ● **VET providers**
  ● **Representatives of Labor Market Bodies**
  ● Innovation support centers
  ● Public authorities and regulatory bodies

Open questions for focus group debate

On the basis of pre-prepared questions discussion during focus group meetings developed. The questions could be supplemented by project partners regarding the results of their country survey on employers and employees.

GENERAL - **Determining digital competence needs**
1. Please share with us your opinion about the digital competencies of elderly (50+ age) employees.
2. According to **your opinion**, which digital competencies are most lacking in the elderly 50+ age group of employees?
3. Which digital competencies are most lacking in our target group?

Then the presentation of preliminary results presents where you identified the biggest gaps in competencies according to the managers' (employers') assessment.

DIGITAL SKILLS GAPS

1. How would you comment the survey results, what do you think about them?
2. Which gaps in the field of digital competencies would you specifically point out?
3. What would you recommend which digital competencies of target group should we focus on, as they are the most important for performing work? Do the targeted elderly employees need any other competencies to work remotely?

KEY DIGITAL SKILLS

1. What is your proposal to close the digital skills gap for the 50+ workforce? What measures do you propose, what should be done depending on the area from which you come (employment offices, SMEs, higher education institutions...)
2. What will be the best way to acquire the necessary skills for employees 50+? (Ask Labor office and training providers what should be done also for unemployed...)
3. Please point out some good practices and describe them.
4. Which digital skills should we focus on in the future so that the representatives of the target group will be the most qualified to perform their work in the future? Please, can you highlight it (this way we get a set of key digital competencies to include in the training program).

Procedure for conducting focus group meetings

a) The moderator (project partner representative) introduces the focus group, then the participants introduce themselves.
b) The moderator requests permission to record the discussion.
c) The moderator presents the project DIG AGE+ and the purpose and objectives of the meeting.
d) Then the moderator starts to ask questions.
e) Then the moderator encourages individual participants to give their opinion regarding the general topic. Their conversation will then touch more and more specific topics, so that the desired information related to the questions asked will come to light. Based on the reflections of the participants, the moderator should guide the discussion with questions in such a way as to discover critical elements.
f) Closing the meeting - the moderator prepares a short summary of the key findings and thanks the participants.

5.5.1 Summary of focus groups findings

We can summarize that focus groups were successfully conducted in all partner institutions in Belgium, Finland, France, Poland and Slovenia from October to November, 2022, which took place in an online environment with the participation of representatives of the institutions that we planned in the desired focus group structure.

Through a conversation based on predetermined questions (instructions for conducting a focus group, DOBA Business School, July 2022), focus group participants generally confirmed the findings of our research among employees 50+ and employers.

We would like to emphasize once again that it is very important how we set up the training programs for the target group of office and other clerks, 50+, so that the planned trainings come as close as possible to the goal of ensuring the development/ acquisition of those digital competencies that are most necessary for successful work , job retention and competitiveness of employees 50+ according to the trends we have identified through our research (desk research, employees and employers' surveys).

The most important and exposed digital skills / competencies that our target groups should be trained at are:
- use digital tools to innovate processes, services and products,
- cyber security - employees lack information security skills when working in digital environments, this might pose a security threat to the organization and thus cyber security skills are seen as one of the most crucial skills to be taught,
- soft skills - the need for continuous learning of the all-the-time developing digital tools. The information systems used in working life are very high-tech tools and require high understanding and skills for their usage. Work becomes more and more digitized all the time and employees must have high problem-solving skills to be able to tackle the problems, both with software and hardware, that they face in their work on a daily basis. They need to have self-management skills to be able to organize their work in the middle of constant interruptions from different software. They need to be aware of their own skills and how to develop them and plan their work,
- terminology as rather an abstract skill - searching relevant information is more challenging if employees 50+ do not know the correct terminology

6. Proposal of a professional profile for Office clerks and other support clerks

6.1. Competency framework

There are 21 competencies that are pertinent to these areas, their titles and descriptors are outlined in Dimension 2. Taken together, Dimension 1 and 2 form the conceptual reference model. Additional Dimensions outline Proficiency levels (Dimension 3), Examples of knowledge, skills and attitudes (Dimension 4) and Use cases (Dimension 5). In DigComp, 5 competence areas outline what the digital competence entails. They are the following: Information and data literacy; Communication and collaboration; Digital content creation; Safety; and Problem solving. The first 3 areas deal with competencies that can be traced back to specific activities and uses. On the other hand, areas 4 and 5 (Safety and Problem solving) are "transversal" as they apply to any type of activity carried out through digital means. Elements of Problem solving, in particular, are present in all competencies, but a specific area was defined to highlight the importance of this aspect for the appropriation of technology and digital practices.

It is important to highlight the competencies included in the professional profile contribute to the attainment of some Sustainable Development Goals, in particular:

- **Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**
    - Target 4.4. By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

- **Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**
    - Target 8.3. Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

Based on the results of the research desk and both surveys of both employees and employers, as well as by checking the identified competencies with focus groups, we prepared an overview of competencies and areas where the largest gaps between existing and required competencies appear. In doing so, we started from the needs for competencies that were identified by employers, as employees assessed the high development of their competencies and the lesser need for the development of competencies in relation to changes in the labor market and the surrounding area in order to increase their employability.

Based on the results of two surveys and desk research, as well as validating digital gaps and ways to eliminate or reduce them, we have prepared an overview of the competencies that

the target group needs most. According to the results of all activities we also added some competencies that were pointed out as the relevant in the focus groups but were not identified with the research. These competencies are marked with red in the table.

We can summarize that the competencies that should be addressed and upskilled with the training program are presented in table 4.

Table 4: Competence needs

COMPETENCE AREA	COMPETENCE
INFORMATION AND DATA LITERACY	Ability to analyze, compare and critically evaluate sources and types of data, information and digital content.
COMMUNICATION AND COLLABORATION	Ability to communicate and collaborate using email and social networking sites (e.g., Facebook, LinkedIn).
	Ability to communicate and collaborate using a variety of digital technologies (e.g., MS Teams, Skype, Zoom, GoTo Meeting).
	Ability to share data, information and digital content with others using appropriate digital technologies (e.g., OneDrive, WeTransfer).
	Ability to adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environment.
DIGITAL CONTENT CREATION	Ability to create more complex digital content in various formats (e.g., infographics, more complex presentations, simulations, videos and other multimedia content).
	Ability to understand how copyright and licenses apply to data, digital information and content.
	To create edit digital content in different formats, to express oneself thought digital means.
SECURITY AND OPERATIONS	Understanding of risks and threats and knowledge of preventive security measures in the digital environment.
PROBLEM SOLVING	Ability to identify and solve technical problems in device management and / or in the use of digital environments.
	Ability to use digital tools to innovate processes, services and products.
	Identifying one's own digital skills gaps and finding opportunities for development and learning.
	Checking my messages before I send them (e.g. for mistakes) is standard practice for me

6.2. The professional profile

Professional profile (also job specification) is a description of the exact tasks involved in a particular job, and of the skills, experience, and personality a person would need in order to do the job.

Professional profile is presented as follows only for identified competencies that have to be upskilled:
   1)   Dimension 1 - **competence area**
   2)   Dimension 2 -**competence**
   3)   Dimension 3- **proficiency level** (is presented for office clerks and other clerks)
   4)   Dimension 4- **examples of knowledge, skills and attitudes**

Dimension 1 outlines the competence areas of which the digital competence is composed. Dimension 2 details the titles of each competence and their descriptors. Dimension 3 is used to describe the proficiency levels of each competence and Dimension 4 describe various examples of the knowledge, skills and attitudes applicable to each competence related to Dimension 2. Each dimension has its specificities allowing for a flexible use of the framework so that it can be adapted to the needs and requirements that emerge from the context.

Competence area 1: INFORMATION AND DATA LITERACY

This is critical as it is not sufficient for employees simply to be able to operate a range of devices and applications, they also need to find and share information, communicate and collaborate, and constantly learn and adapt in order to achieve tasks, solve problems, be productive, and flourish in the digital workplace.

As digital tools permeate the workplace, the core skills needed for individuals to operate effectively in the digital workplace have become essential.

DIMENSION 2[1] : COMPETENCE

1.2   COMPETENCE EVALUATING DATA, INFORMATION AND DIGITAL CONTENT

To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content.

The ability to **analyze, compare and critically evaluate** sources and types of data, information and digital content

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[1] *Dimension 2 number is presented according to the DigComp 2.2.*

DIMENSION 3 • PROFICIENCY LEVEL

INTERMEDIATE[2]	On my own and solving straightforward problems, I can:	• perform the analysis, comparison and evaluation of the credibility and reliability of well-defined sources of data, information and digital content. • perform the analysis, interpretation and evaluation of well-defined data, information and digital content
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• perform the analysis, comparison and evaluation of sources of data, information and digital content. • perform the analysis, interpretation and evaluation of data, information and digital content

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Aware that online environments contain all types of information and content including misinformation and disinformation, and even if a topic is widely reported it does not necessarily mean it is accurate. • Understands the difference between disinformation (false information with the intent to deceive people) and misinformation (false information regardless of intent to deceive or mislead people). • Knows the importance of identifying who is behind information found on the internet (e.g. on social media) and verifying it by checking multiple sources, to help recognize and understand point of view or bias behind particular information and data sources • Aware of potential information biases caused by various factors (e.g. data, editorial choices, censorship, one's own personal limitations).
SKILLS	• Carefully considers the top/first search results in both text-based and audio searches, as they may reflect commercial and other interests rather than be the most appropriate results for the query. • Knows how to differentiate sponsored content from other content online (e.g. recognizing advertisements and marketing messages on social media or search engines) even if it is not marked as sponsored.

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[2] Intermediate proficiency level means that tasks are well-defined, routine tasks, and straightforward problems, some non-routine problems. Autonomy: On their own, Independent and according to their needs. Cognitive domain is understanding. (DigComp 2.2.)

	• Knows how to analyses and critically evaluate search results and social media activity streams, to identify their origins, to distinguish fact-reporting from opinion, and to determine whether outputs are truthful or have other limitations (e.g. economic, political, religious interests). • Knows how to find the author or the source of the information, to verify whether it is credible (e.g. an expert or authority in a relevant discipline). • Basic keyboard skills
ATTITUDES	• Inclined to ask critical questions in order to evaluate the quality of online information, and concerned about purposes behind spreading and amplifying disinformation. • Willing to fact-check a piece of information and assess its accuracy, reliability and authority, while preferring primary sources over secondary sources of information where possible. • Carefully considers the possible outcome before clicking a link.

Competence area 2: COMMUNICATION AND COLLABORATION

Communicate in the digital workplace using the most appropriate tools and in a manner that is suited to the audience, context, and channel. With the average worker reportedly spending 28 percent of their time, managing email 23% and nearly 15% of time on inefficient communications, 24% understanding how to communicate confidently and fluently in the digital workplace is a critical skill for all employees. Developing skill in this area involves having an awareness of the different channels available for employees to communicate and knowledge of which one to use for what purpose. For instance, choosing between an email, a post in a community site, an instant message, or an update to an activity feed. The ability to use a range of different channels and formats demonstrates capacity to communicate well in the digital workplace. Within each channel, it is important to know how best to process, prioritize, organize and create messages. Employees who are skilled in this area communicate information and ideas in a manner that is appropriate to the audience, context, and format. This includes starting new discussion threads on forums and responding to existing ones in a skillful way. This is essential for individuals to participate effectively in knowledge sharing activities. Adapting the tone, length, and style of messages across different communication channels is also key.

Communicating well in the digital workplace also involves an understanding of the 'netiquette' of online interactions. For instance, expressing disagreement in a discussion thread while remaining courteous and respectful of another's view, writing messages with consideration of how they may be perceived by the recipient, or only replying to everyone on an email where absolutely necessary. Notions of 'netiquette' can also extend to face-to-face interactions were, for example, using a smartphone during a meeting ('phubbing' in popular parlance) would be poor practice

Collaborate are the skills to work productively and effectively with others as part of a virtual team or community, including establishing trust and shared ownership. Skills in communicating and relating online also contribute to individuals' capacity to collaborate

with others using the digital workplace in order to share knowledge and achieve common tasks or goals. Employees will need to navigate a range of formal and informal collaboration environments as well as participating in both synchronous and asynchronous activities. This involves an understanding of how to work with others as part of a virtual team to solve problems, demonstrating shared ownership and accountability. More advanced skills may include creating and facilitating groups in digital environments in order to help the organization and colleagues get the most out of collaboration platforms. Employees need to understand how to build trust online (an extension of the 'Relate' capabilities) so that virtual teams can quickly become cohesive and work effectively together. For instance, sharing information about personal interests or sharing video during calls as ways of building social capital with virtual colleagues. Trust is also key for individuals to feel that they can shared unfinished 'work in progress' in online collaboration environments, rather than only be comfortable with publishing a perfect, finished output. In the following, we present the competencies for the field of communication and collaboration.

DIMENSION 2 - COMPETENCE

2.2 SHARING THROUGH DIGITAL TECHNOLOGIES
To share data, information and digital content with others through appropriate digital technologies. To act as an intermediary, to know about referencing and attribution practices.

Ability to **share data, information and digital content** with others using appropriate digital technologies (e.g., OneDrive, WeTransfer).

DIMENSION 3 • PROFICIENCY LEVEL

ADVANCED[3]	As well as guiding others, I can:	- share data, information and digital content through a variety of appropriate digital tools, - show others how to act as an intermediary for sharing information and content through digital technologies. - apply a variety of referencing and attribution practices
	At advanced level, according to my own needs and those of others, and in complex contexts, I can:	- assess the most appropriate digital technologies to share information and content. - adapt my intermediation role, - vary the use of the more appropriate referencing and attribution practices.

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[3] IAdvanced proficiency level mens different tasks and problems, most appropriate tasks. Autonomy: Guiding others and able to adapt to others in a complex context. Cognitive domain is applying and somethimes evaluating. (DigComp 2.2.)

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Aware that everything that one shares publicly online (e.g. images, videos, sounds) • Knows the role and responsibilities of the online facilitator to structure and guide a discussion group (e.g. how to act as an intermediary when sharing information and digital content in digital environments).
SKILLS	• Knows how to share digital content (e.g. pictures) across multiple devices (e.g. from smartphones to cloud services). • Knows how to share and show information from one's own device (e.g. show graphs from a laptop) to support a message being conveyed during a real time online session (e.g. video conference). • Knows how to share data, information and digital content with others using appropriate digital technologies (e.g., OneDrive, WeTransfer). • Able to select and restrict with whom the content is shared (e.g. giving access only to friends on social media, allowing only co-workers to read and comment on a text). • Knows how to curate content on content sharing platforms so as to add value for oneself and others (e.g. shares music playlists, shares comments on online services). • Knows how to acknowledge the original source and authors of shared content. • Knows how to flag or report disinformation and misinformation to fact-checking organizations and to social media platforms in order to stop it spreading.
ATTITUDES	• Willing to share expertise on the internet, for example through intervening in online forums, contributing to Wikipedia or through creating Open Educational Resources. • Open towards sharing digital content that might be interesting and useful to others. • Inclined not to share digital resources if not able to cite their author or source in an appropriate manner.

2.4 COLLABORATING THROUGH DIGITAL TECHNOLOGIES

To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of data, resources and knowledge.

Ability to communicate and collaborate **using email and social networking sites** (e.g., Facebook, LinkedIn).

Ability to communicate and collaborate **using a variety of digital technologies** (e.g., MS Teams, Skype, Zoom, GoTo Meeting).

DIMENSION 3 • PROFICIENCY LEVEL

INTERMEDIATE	On my own and solving straightforward problems, I can:	● select well-defined and routine digital tools and technologies for collaborative processes
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	● select digital tools and technologies for collaborative processes

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	● Aware of the advantages of using digital tools and technologies for remote collaborative processes (e.g. reduced commuting time, join specialized skills together regardless of location). ● Understands that in order to co-create digital content with other people, good social skills (e.g. clear communication, ability to clarify misunderstandings) are important to compensate for the limitations of online communication. ● Knows and understands the digital terminology (e.g. use of abbreviations, shorter paths to data, etc.) ● Knows how to communicate and collaborate using email and social networking sites (e.g., Facebook, LinkedIn).
SKILLS	● Knows how to use digital tools in a collaborative context to plan and share tasks and responsibilities within a group of friends, a family or a sport or work team (e.g. digital calendar, planners for trips and leisure activities). ● Knows how to use digital tools to facilitate and improve collaborative processes, for example through shared visual boards and digital canvases (e.g. Mural, Miro, Padlet).

	• Knows how to use a variety of digital technologies (e.g., MS Teams, Skype, Zoom, GoTo Meeting). • Knows how to use digital tools and technologies in a remote working context for idea generation and co-creation of digital content (e.g. shared mind maps and whiteboards, polling tools). • Knows how to evaluate the advantages and disadvantages of digital applications for making collaboration effective (e.g. the use of online spaces for co-creation, shared project management tools).
ATTITUDES	• Encourages everyone to express their own opinions constructively when collaborating in digital environments. • Acts in trustworthy ways to achieve group goals when engaging in co-construction of resources or knowledge. • Inclined to use appropriate digital tools for fostering collaboration between the members of a team while, at the same time, ensuring digital accessibility.

2.5 NETIQUETTE

To be aware of behavioral norms and know-how while using digital technologies and interacting in digital environments. To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments.

Able to **adapt communication strategies to the specific audience and to be aware** of cultural and generational diversity in digital environment.

DIMENSION 3 • PROFICIENCY LEVEL

FOUNDATION	At basic level and with guidance, I can:	• differentiate simple behavioral norms and know-how while using digital technologies and interacting in digital environments. • choose simple communication modes and strategies adapted to an audience and • differentiate simple cultural and generational diversity aspects to consider in digital environments
	At basic level and with autonomy and appropriate guidance where needed, I can:	• differentiate simple behavioural norms and know-how while using digital technologies and interacting in digital environments. • choose simple communication modes and strategies adapted to an audience and • differentiate simple cultural and generational diversity aspects to consider in digital environments

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Aware of the meaning of non-verbal messages (e.g. smiley faces, emojis) used in digital environments (e.g. social media, instant messaging) and knowing that their use can culturally differ between countries and communities. • Aware of the existence of some expected rules about one's behaviour when using digital technologies (e.g. using audio headsets instead of loudspeakers when taking calls in public places or listening to music). • Understands that inappropriate behaviours in digital environments (e.g. drunken, being overly intimate and other sexually explicit behaviour) can damage social and personal aspects of lives over a long term. • Aware that adapting one's behaviour in digital environments depends on one's relationship with other participants (e.g. friends, co-workers, managers) and the purpose in which the communication takes place (e.g. to instruct, inform, persuade, order, entertain, inquire, socialize). • Aware of accessibility requirements when communicating in digital environments so that communication is inclusive and accessible for all users (e.g. for people with disabilities, older people, those with low literacy, speakers of another language).
SKILLS	• Knows how to stop receiving unwanted disturbing messages or emails. • Able to manage one's feelings when talking with other people on the internet. • Knows how to recognize hostile or derogatory messages or activities online that attack certain individuals or groups of individuals (e.g. hate speech). • Can manage interactions and conversations in different socio-cultural contexts.
ATTITUDES	• Believes that it is necessary to define and share rules within digital communities (e.g. explain codes of conduct for creating, sharing or posting content). • Inclined to adopt an empathic perspective in communication (e.g. being responsive to another person's emotions and experiences, negotiating disagreements to build and sustain fair and respectful relationships). • Open to and respectful of the views of people on the internet with different cultural affiliations, backgrounds, beliefs, values, opinions or personal circumstances; open to the perspectives of others even if they differ from one's own.

Competence area 3: DIGITAL CONTENT CREATION

DIMENSION 2 - COMPETENCE

3.1 DEVELOPING DIGITAL CONTENT

To create and edit digital content in different formats, to express oneself through digital means.

Ability to **create more complex digital content in various formats** (e.g., infographics, more complex presentations, simulations, videos and other multimedia content).

To **create and edit digital content in different formats**, to express oneself thought digital means.

DIMENSION 3 • PROFICIENCY LEVEL

	On my own and solving straightforward problems, I can:	• indicate ways to create and edit well-defined and routine content in well-defined and routine formats, • express myself through the creation of well-defined and routine digital means.
INTERMEDIATE	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• indicate ways to create and edit content in different formats, • express myself through the creation of digital means.

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	- Knows that digital content exists in a digital form and that there are many different types of digital content (e.g. audio, image, text, video, applications) that are stored in various digital file formats. - Knows that AI systems can be used to automatically create digital content (e.g. texts, news, essays, tweets, music, images) using existing digital content as its source. Such content may be difficult to distinguish from human creations. - Aware that "digital accessibility" means ensuring that everyone, including people with disabilities, can use and navigate the internet. Digital accessibility includes accessible websites, digital files and documents, and other web-based applications (e.g. for online banking, accessing public services, and messaging and video-calling services). - Aware that virtual reality (VR) and augmented reality (AR) allow new ways to explore simulated environments and interactions within the digital and physical worlds.
SKILLS	- Can use tools and techniques to create accessible digital content (e.g. add ALT text to images, tables and graphs; create a proper and well-labelled document structure; use accessible fonts, colours, links) - Knows how to select the appropriate format for digital content according to its purpose (e.g. saving a document in an editable format vs one that cannot be modified but is easily printed). - Knows how to create digital content to support one's own ideas and opinions (e.g. to produce data representations such as interactive visualisations using basic datasets such as open government data).
ATTITUDES	- Inclined to combine various types of digital content and data to better express facts or opinions for personal and professional use. - Open to explore alternative pathways to find solutions to produce digital content

3.3 COPYRIGHT AND LICENCES

To understand how copyright and licences apply to digital information and content.

Ability to **understand how copyright and licences apply to data**, digital information and content.

DIMENSION 3 • PROFICIENCY LEVEL

FOUNDATION	At basic level and with guidance, I can:	• identify simple rules of copyright and licenses that apply to data, digital information and content.
	At basic level and with autonomy and appropriate guidance where needed, I can:	• identify simple rules of copyright and licenses that apply to data, digital information and content.

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Knows that digital content, goods and services might be protected under intellectual property (IP) rights (e.g. copyright, trademarks, designs, patents). • Aware that the creation of digital content (e.g. pictures, texts, music) when original is considered protected by copyright as soon as it exists (automatic protection). • Aware of the legal limitations of using and sharing digital content (e.g. music, movies, books) and the possible consequences of illegal actions (e.g. sharing copyrighted content with others can give rise to legal sanctions).
SKILLS	• Able to identify and select digital content for downloading or uploading legally (e.g. public domain databases and tools, open licences). • Knows how to use and share digital content legally (e.g. checks the terms and conditions and licensing schemes available, such as the various types of Creative Commons) and knows how to assess whether limitations and copyright exceptions apply.
ATTITUDES	• Respectful of rights affecting others (e.g. ownership, contract terms), only using legal sources for downloading digital content (e.g. movies, music, books) and when relevant, opting for open-source software.

Competence area 4: SECURITY AND OPERATIONS

DIMENSION 2 : COMPETENCE

4.1. PROTECTING DEVICES

To protect devices and digital content, and to understand risks and threats in digital environments. To know about safety and security measures and to have a due regard to reliability and privacy.

Understanding of risks and threats and knowledge of preventive security measures in the digital environment.

DIMENSION 3 • PROFICIENCY LEVEL

ADVANCED	As well as guiding others, I can:	- apply different ways to protect devices and digital content, and - differentiate a variety of risks and threats in digital environments. - apply safety and security measures. - employ different ways to have due regard to reliability and privacy.
	At advanced level, according to my own needs and those of others, and in complex contexts, I can:	- choose the most appropriate protection for devices and digital content, and - discriminate risks and threats in digital environments. - choose the most appropriate safety and security measures. - assess the most appropriate ways to have due regard to reliability and privacy

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	- Knows that using different strong passwords for different online services is a way to mitigate the negative effects of an account being compromised (e.g. hacked). - Knows about measures to protect devices (e.g. password, fingerprints, encryption) and prevent others (e.g. a thief, commercial organization, government agency) from having access to all data. - Knows about the importance of keeping the operating system and applications (e.g. browser) up-to-date, in order to fix security vulnerabilities and protect against malicious software (i.e. malware). - Knows that a firewall blocks certain kinds of network traffic, aiming to prevent different security risks (e.g. remote logins). - Aware of different types of risks in digital environments, such as identity theft (e.g. someone committing fraud or other crimes

	using another person's personal data), scams (e.g. financial scams where victims are tricked into sending money), malware attacks (e.g. ransomware).
SKILLS	- Knows how to adopt a proper cyber-hygiene strategy regarding passwords (e.g. selecting strong ones difficult to guess) and managing them securely (e.g. using a password manager). - Knows how to install and activate protection software and services (e.g. antivirus, anti-malware, firewall) to keep digital content and personal data safer. - Knows how to activate two-factor authentication when available (e.g. using one-time passwords, OTP, or codes along with access credentials). - Knows how to check the type of personal data an app accesses on one's mobile phone and, based on that, decides whether to install it and configures the appropriate settings. - Able to encrypt sensitive data stored on a personal device or in a cloud storage service. - Ability to protect personal data and to protect oneself and others
ATTITUDES	- Vigilant not to leave computers or mobile devices unattended in public places (e.g. shared workplaces, restaurants, trains, car backseat). - Weighs the benefits and risks of using biometric identification techniques (e.g. fingerprint, face images) as they can affect safety in unintended ways. If biometric information is leaked or hacked, it becomes compromised and can lead to identity fraud. - Keen to consider some self-protective behaviours such as not using open Wi-fi networks to make financial transactions or online banking

Competence area 5: PROBLEM SOLVING

Problem-solving abilities are essential in virtually the mark of an independent employee. Problem solving is all about using logic, as well as imagination, to make sense of a situation and come up with an intelligent solution. In fact, the best problem solvers actively anticipate potential future problems and act to prevent them or to mitigate their effects.

Generally, problem-solving refers to a person's ability to successfully manage and find solutions for complex and unexpected situations.

Candidates with great problem-solving skills have a combination of both analytical and creative thinking. They're comfortable with making decisions and confident enough to rise to challenges in the workplace.

These candidates possess a combination of analytical, creative, critical thinking skills and a high level of attention to detail. As a result, they will quickly identify problems when they

arise and identify the most effective solutions. They'll also identify the factors and forces that might have caused the problem and instigate changes to mitigate future challenges.

Problem-solving abilities are connected to a number of other skills, including:
- analytical skills
- innovative and creative thinking
- a lateral mindset
- adaptability and flexibility
- level-headedness
- initiative
- resilience (in order to reassess when your first idea doesn't work)
- teamworking (if problem solving is a team effort)
- influencing skills (to get colleagues, clients and bosses to adopt your solutions).

In fact, the ability to solve problems is an essential part of any employee's skill set, even if it isn't specified on the job description.

Identifies the problem and considers potential solutions. Employs multiple problem-solving strategies. Seeks assistance as necessary.

DIMENSION 2: COMPETENCE

5.1. SOLVING TECHNICAL PROBLEMS

To identify technical problems when operating devices and using digital environments, and to solve them (from trouble-shooting to solving more complex problems).

They must be able to **identify and solve technical problems in device** management and / or in the use of digital environments

DIMENSION 3 • PROFICIENCY LEVEL

ADVANCED	As well as guiding others, I can:	• assess technical problems when using digital environments and operating digital devices. • apply different solutions to them.
	At advanced level, according to my own needs and those of others, and in complex contexts, I can:	• appraise technical problems when operating devices and using digital environments • resolve them with the most appropriate solution

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	- Knows the main functions of the most common digital devices (e.g. computer, tablet, smartphone). - Knows some reasons why a digital device may fail to connect online (e.g. wrong Wi-fi password, airplane mode on). 219. Knows that computing power or storage capacity can be improved to overcome fast obsolescence of hardware (e.g. by contracting power or storage as a service). - Aware that the most frequent sources of problems in Internet of Thing (IoT) and mobile devices, and in their applications, are related to connectivity/network availability, battery/power, limited processing power. - Aware that AI is a product of human intelligence and decision-making (i.e. humans choose, clean and encode the data, they design the algorithms, train the models, and curate and apply human values to the outputs) and therefore does not exist independently of humans. (AI)
SKILLS	- Knows how to identify and solve a camera and/or a microphone issue when in an online meeting. - Knows how to verify and troubleshoot problems related to interconnected IoT devices and their services. - Takes a step-by-step approach to identify the root of a technical problem (e.g. hardware vs software) and explores various solutions when facing a technical malfunction. - Knows how to find solutions on the internet when facing a technical problem
ATTITUDES	Takes an active and curiosity driven approach to explore how digital technologies operate

5.3 CREATIVELY USING DIGITAL TECHNOLOGY

To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.

Ability to **use digital tools to innovate processes**, services and products.

DIMENSION 3 • PROFICIENCY LEVEL

INTERMEDIATE	On my own and solving straightforward problems, I can:	• select digital tools and technologies that can be used to create well-defined knowledge and well-defined innovative processes and products. • engage individually and collectively in some cognitive processing to understand and resolve well-defined and routine conceptual problems and problem situations in digital environments
	Independently, according to my own needs, and solving well-defined and non-routine problems, I can:	• differentiate digital tools and technologies that can be used to create knowledge and to innovate processes and products. • engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Knows that engaging in solving problems collaboratively, online or off-screen, means that one can take advantage of the variety of knowledge, perspectives and experiences from others which can lead to better outcomes. • Knows that digital technologies and electronic devices can be used as a tool to support the innovation of new processes and products, in order to create social, cultural and/or economic value (e.g. social innovation). Aware that what creates economic value might endanger or enhance social or cultural value. • Knows that applications of Internet of Things (IoT) technology have the potential to be used in many different sectors (e.g. healthcare, agriculture, industry, automobiles, citizen science activities).
SKILLS	• Knows how to use digital technologies to help turn one's idea into action (e.g. master video making to open a channel to share recipes and nutrition tips for a specific dietary style). • Can identify online platforms that can be used to design, develop and test IoT technologies and mobile apps. • Knows how to plan a strategy using multiple IoT and mobile devices to implement a task (e.g. use a smartphone to optimize energy consumption in a room by setting the intensity of the lights based on the time of day and ambient light). • Knows how to engage in resolving social problems through digital, hybrid and non-digital solutions for the problem (e.g.

	envisioning and planning online time banks, public reporting systems, resource sharing platforms).
ATTITUDES	- Willing to take part in challenges and contests aimed at solving intellectual, social or practical problems through digital technologies (e.g. hackathons, ideations, grants, joint initiation of projects). - Motivated to co-design and co-create new products and services using digital devices (i.e. end-user development) to create economic or social value for others (e.g. in makerspaces and other collective spaces). - Open to engage in collaborative processes to co-design and co-create new products and services based on AI systems to support and enhance citizens' participation in society. (A

5.4 IDENTIFYING DIGITAL COMPETENCE GAPS

To understand where one's own digital competence needs to be improved or updated. To be able to support others with their digital competence development. To seek opportunities for self-development and to keep up-to-date with the digital evolution.

They have to be aware to **identify their own digital skills gaps and** also able to find **opportunities** for development and learning.

DIMENSION 3 • PROFICIENCY LEVEL

ADVANCED	As well as guiding others, I can:	- demonstrate where my own digital competence needs to be improved or updated, - illustrate different ways to support others in the development of their digital competence. - propose different opportunities found for self-development and to keep up-to-date with the digital evolution.
	At advanced level, according to my own needs and those of others, and in complex contexts, I can:	- decide which are the most appropriate ways to improve or update one's own digital competence needs, - assess the development of others' digital competence. - choose the most appropriate opportunities for self-development and to keep up-to date with new developments

DIMENSION 4 • EXAMPLES OF KNOWLEDGE, SKILLS AND ATTITUDES

KNOWLEDGE	• Aware that being digitally competent entails the confident, critical and responsible use of digital technologies to achieve goals related to work, learning, leisure, inclusion and participation in society. • Aware that difficulties experienced while interacting with digital technologies may be due to technical issues, lack of confidence, one's own competence gap or inadequate choice of digital tool to solve the problem in question. • Aware that digital tools can be used to help identify one's learning interests and setting personal goals in life (e.g. learning pathways). • Knows that online learning can offer opportunities (e.g. video-tutorials, online-seminars, blended-learning-courses, Massive Open Online Courses) to keep up-to-date with developments in digital technologies and to develop new digital skills. Some online learning opportunities also accredit the learning outcomes (e.g. through micro-credentials, certifications). • Aware that AI is a constantly-evolving field, whose development and impact is still very unclear. (AI)
SKILLS	• Knows how to get reliable feedback on digital competence through self-assessment tools, digital skills testing and certification. • Capable of reflecting on one's level of competence, and to make plans and take action to upskill (e.g. by joining the municipality training course on digital competence). • Knows how to talk about the importance of recognizing "fake news" to others (e.g. elders, youngsters) by showing examples of reliable news sources, and how to differentiate between the two.
ATTITUDES	• Has a disposition to keep learning, to educate oneself and stay informed about AI (e.g. to understand how AI algorithms work; to understand how automatic decision-making can be biased; to distinguish between realistic and unrealistic AI; and to understand the difference between Artificial Narrow Intelligence, i.e. today's AI capable of narrow tasks such as game playing, and Artificial General Intelligence, i.e. AI that surpasses human intelligence, which still remains science fiction). (AI) • Open to ask to be taught how to use an application (e.g. how to book a doctor's appointment on the internet) rather than delegating the task to someone else. • Willing to help others to improve their digital competencies, building on their strengths and mitigating their weaknesses. 258.

	Does not get discouraged by the fast pace of technological changes but believes that one can always learn more about how technology can be used in today's society.
	● Readiness to value one's own potential, as well as others´ potential, to continuously learn using digital technologies as a lifelong process that requires openness, curiosity and determination.

6.3 Professional profile- summary

In the following, we present in a table 5 a summary of the needs for the development of digital competencies for employees 50+ who work in the positions of office clerks and other support clerks, according to competence area, competence and proficiency level.

Table 5: Professional profile- summary

Dimension 1: Competence area	Dimension 2: Competence	Dimension 3: Proficiency level
INFORMATION AND DATA LITERACY	1.2 Competence evaluating data, information and digital content	Intermediate
COMMUNICATION AND COLLABORATION	2.2 Sharing through digital technologies	Advanced
	2.4 Collaborating through digital technologies	Intermediate
	2.5 Netiquette	Foundation
DIGITAL CONTENT CREATION	3.1 Developing digital content	Intermediate
	3.3 Copyright and licenses	Foundation
SECURITY AND OPERATIONS	4.1. Protecting devices	Advanced
PROBLEM SOLVING	5.1. Solving technical problems	Advanced
	5.3 Creatively using digital technology	Intermediate
	5.4 Identifying digital competence gaps	Advanced

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