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In digitalisation social partners trust. The impact of digitalisation on job quality and social dialogue in the public services in Finland

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EXECUTIVE SUMMARY

In digitalisation social partners trust. The impact of digitalisation on job quality and social dialogue in the public services in Finland

The aim of this Research paper is to analyse various impacts of digitalisation on job quality in public administrative services, in the electricity sector and in the health care sector in Finland. The paper provides a review of the relevant policies and draws on the existing literature, a European-wide online survey and qualitative research, including a thematic focus group and employee interviews. Thus, the findings are based on the mixed-method approach. Three trade unions representing public sector employees participated in the survey, interviews and focus group discussions, whereas the electricity sector is represented only via the survey; the trade union for nurses only took part in the interviews. However, the health care sector – including nurses and practical nurses – is represented by other trade unions covering employees in the public and private sector services. The number of online survey responses from the public sector was 1,251, and 809 responses came from the hospital and health care sector. The smallest group of responses (111) were from the electricity sector. Because of the small number of responses, results should be treated as indicative rather than confirmatory.

Background information

Finland ranks first on the 2022 Digital Economy and Society Index (DESI). Finland's high score is based on good performance on the human capital, integration of digital technology and digital public services indices. The high ranking is a result of a long developmental path. Thanks to the individual social security number introduced in the early 1960s, it became possible to combine different data bases. Gradually, most data on social security and health care were digitalised to make public service and health care processes more seamless and less bureaucratic. In health and social care there is a specific digital service infrastructure, containing information on social welfare and health care, vaccinations and benefit utilisation. All information is available from the same source, allowing the service providers to offer their clients better and more accurate services. People themselves can check their own details and keep an eye on their own data. As regards public services, most information is digitally available for decisions. The client does not need to provide unnecessary documents and if some documents are needed, they can be delivered digitally. The service is faster and less bureaucratic than in the 'paper era' when the clients had to obtain and deliver all papers by themselves.

As regards the health care sector, electronic patient records reached 100% coverage in 2007. The National Archive of Health Information (Kanta) has been in use since 2014. All health care providers use it. Individual users can seek information on their own personal health and health care records. The digital repository is invaluable from the health care provider's perspective.

Medical doctors or hospitals providing health care can immediately see the medical and sickness records of the patient, which, in emergency situations in particular, is of crucial importance.

Digitalisation has transformed the whole electricity sector. There are now new ways to distribute energy and service customers. One important potential implication of digitalisation is its ability to break down boundaries between energy subsectors, enabling integration and cooperation between various actors and systems. This kind of interconnectivity makes it possible to optimise supply and demand in real time. Due to digitalisation, it is now easy to load the extra electricity produced by customers' own solar panels to the main grid or sell the surplus electricity to other users. Nowadays, the Internet of Things (IoT) and other advanced artificial-intelligence solutions are important in exchanging data, goods, and services, as well as in property maintenance.

Key findings

The utilisation of digital tools is widespread in Finland. Virtually all respondents and focus group participants report that they use digital devices, but there are significant differences between the three sectors in employees' attitudes to digitalisation and impacts of digitalisation. According to our results, public service employees are the most positive about and satisfied with digitalisation, followed by health care workers. The least positive attitudes are found in the electricity sector. The picture is largely the same regardless of whether we look at perceived impacts of digitalisation at the individual or at a more general level. Within each sector, respondents are more negative about the personal impacts of digitalisation than about more general impacts of digitalisation, i.e. on society or employment. The respondents understand the importance of digitalisation and the digital economy, but they do not immediately see positive effects of the process in their own life, working conditions or income.

The overall view of digitalisation in the public administration sector is rather positive. Digitalisation is regarded as a necessary tool to better serve clients and to improve productivity. It is not regarded as a major threat to employment in general or to employment in the sector. Furthermore, digitalisation combined with teleworking is seen as making it possible to better reconcile work and family life. In the two other sectors, opinions are more negative. There are fewer possibilities for teleworking in the hospital sector. Therefore, the work-life balance is depicted in more negative terms. In the three sectors, employees complain that introduction of digital tools has been top-down and often the training has been unsatisfactory. Connectivity seems not to be a major problem in the sector studies.

One of the most important aspects of work is whether one's work is interesting or not. In this respect there are no major differences between the electricity and hospital sectors, whereas there are statistically highly significant differences between public services and the other two sectors. In

the public service sector, digitalisation is seen as a necessary and fundamental tool to serve clients. By contrast, in health care, employees often see that digital processes actually interfere between them and their clients; they are much more likely to believe that the time they use for digital operations takes away time from their basic job, taking care of their patients.

Unsurprisingly, opinions on digitalisation are linked to occupational status. Rather surprisingly though, the relationship is not linear. Those in the lower levels of the hierarchy tend to have more negative opinions of digitalisation. Highly skilled professionals and highly skilled technicians have the most positive views on digitalisation. Interestingly, skilled professionals and skilled technicians display surprisingly low values. Their values are lower than the values for moderately skilled clerical workers.

In 2020, Finland launched a development programme for work and wellbeing at work, aiming to make more effective use of digital technology, to create working life innovations and to enhance work quality and wellbeing at work. The programme is carried out in collaboration with ministries, public sector institutions, and trade unions and employer federations. Despite many disputes, the Finnish social partners share some important views. Most importantly, the social partners agree that the digitalisation of society in general, and the digitalisation of production modes in particular, will fundamentally change the old practices and ways of doing things. The Finnish social partners see this transformation as a positive evolution. In their joint memorandum report on digital transformation, trade unions and employer federations acknowledge that the digital revolution will change the content of work in all professions. While some of the old tasks will disappear or be organised in totally different ways, new professions and tasks will arise to compensate for the destruction of the old ones. The social partners emphasise that digitalisation of working life must be steered by a culture of mutual trust. In contrast to doomsday prophesies of the end of work, trade unions also believe that digitalisation and artificial intelligence (AI) will produce significant improvements in productivity, employment, delivery of public services and work processes at workplaces. In the joint memorandum written by representatives of trade unions and employer federations, there are four major points: 1) ensuring the development of skills and competences; 2) support for workplaces in the introduction of new technologies and new ways of doing things; 3) coherent and fair rules of play for a harmonised operating environment; and 4) working together towards better solutions. Digitalisation has not had any major impact on social dialogue in Finland and interestingly digitalisation is not an issue in any collective agreements analysed for this study. In a way, digitalisation is a part of everyday business and an essential part of work processes.

The social partners see that success in the digital future requires investments in research and innovation to facilitate and speed up economic growth, employment, productivity and skills

formation. Increases in productivity will only take place if the implementation of new technologies in the production process is supported by training and by stronger collaboration between different actors (for example, employers, employee organisations, educational institutions and lifelong learning providers). Since the most important changes in the utilisation of technology will take place in workplaces, labour market institutions must be at the forefront of development and provide policy tools to support the change.

Conclusion and policy pointers

In present-day society, digital literacy is an essential precondition for full societal participation, in the sense that people must have sufficient capacities to participate in working life and more generally to cope in society. Digital literacy includes two central aspects. The first aspect is the capacity to read and critically evaluate what one has read. This aspect pertains to all information available in digitalised form, through all possible digital channels. Regarding acquisition and implementation of new digital technologies and software, the usual processes by which this takes place seem to be organised in a manner which is excessively top-down in nature. Usually, an employer just declares that a new digital system will be introduced. Employees are forced to simply adapt to these changes. Despite the high scores on the Digital Economy and Society Index, there are numerous aspects where improvements are needed:

- Digital literacy must be included in curricula at all levels of education.

- Life-long learning in general, and employer-provided training in particular, must better take into consideration individual needs.

- Special measures should be planned and taken to enhance participation of those who have inadequate digital skills. As a rule, those who have digital skills currently participate much more in further education, whereas those lacking skills participate much less.

- The process of acquisition of new technologies is too much of a top-down process. Such processes should include more genuine dialogue between employees and employers.

The second major aspect to successful social participation relates to skills in digital writing in digital service forums. Such skills become increasingly relevant when services traditionally provided face-to-face (such as health care, mental health care services, etc.) are digitalised. This issue is most important in the public services and in health care.

Regarding public services, the combining of databases will help clients with multiple intertwined problems. Clients no longer need to provide a multitude of documents, which will simplify and speed up decision-making processes. Regarding social and health care services, digitalisation facilitates more personalized, preventive, and predictive healthcare services. For all these hopes to be materialised, there is a need to:

- Improve the sectoral coordination between different actors.

- Better coordinate digital platforms between welfare counties to make data exchange and information flows more seamless.

One specific group which tends to lack linguistic and digital skills are immigrants in general, and refugees in particular. Immigrants' employment rates tend to be 20 percentage points lower than among the native population in Finland. The same applies to people with disabilities, with employment rates in this group likely to be even further below that of the general population. In order to improve the situation, new digital technologies (for example, digital interpretation services, remote work, mobile work, and other digital employment arrangements) should be used to promote the inclusion of disadvantaged persons in the labour force.

SECTION 1. INTRODUCTION

This research paper presents the results of the national study carried out as part of the European Commission-funded DIGIQU@LPUB project, which studies the impact of digitalisation on job quality and social dialogue in the public services in eight European Union (EU) Member States: Denmark, Finland, France, Germany, Hungary, Italy, Poland, Spain. The study is led by the European Social Observatory (OSE).

The project aims at improving understanding of the impact of digitalisation on job quality in the public services, by highlighting the perceptions that workers themselves have of the changes generated by digitalisation in the performance of their daily tasks. The study focuses specifically on three sectors: public administration, electricity and the hospital sector. The project also aims at raising awareness among trade unions and decision-makers of the consequences of the digital transition of work for the public services. Specific objectives include the following:

- To assess the impact of digitalisation on job quality from the perspective of trade unions, but also of public service workers themselves. The intention is to identify the changes affecting the nature, content and implementation processes of the tasks involved in the jobs of public service workers, as well as the outcomes for the workers.

- To explore how the challenges and opportunities for job quality generated by the digitalisation of work in public services are included and addressed in the dynamics and practices of social dialogue at national and sectoral levels in selected EU Member States.

- To enrich the debate about this topic among social partners and to provide advice, through hands-on policy recommendations, to both European and national trade unions and decision-makers, on suitable ways to address the digital transformation of work.

In recent years, employees in the service sectors are increasingly using digital tools and work processes that shape the way their job tasks are organised, implemented, scheduled, and controlled, and ultimately also shape how new processes benefit service users. The focus in this working paper is on those changes and their impact on various aspects of work. We discuss possible changes in labour market negotiations and in the social dialogue in Finland. The focus is on trade unions operating in the public administration, health care and public services.

Three unions participated in the DIGIQU@LPUB online survey, interviews and focus group discussions: *Kelan toimihenkilöt* (representing employees in the biggest social insurance institution Kela), *JHL* (representing public sector employees) and *Pro* (representing public and private sector

employees) ([1]). *Sähköliitto* (the trade union for employees in the electricity sector) only took part in the digital survey, and *Tehy* (the trade union for nurses) only took part in the interviews. *SuPer* (the trade union of practical nurses) decided not to participate at all. However, the health care sector – including nurses and practical nurses – is represented by two other trade unions (JHL and Pro, covering employees in the public and private sector services). In addition to JHL and Pro, the trade union for Kela-employees (*Kelan toimihenkilöt*), representing the public services, participated in the survey. Their representatives were also interviewed. Whenever claims in the text below draw on statements from a focus group, the source mentions 'FG X'; the equivalent reference to an interview is 'INT X' (see the Annexes).

The total number of responses to the digital survey from public sector employees was 1,251, and 809 responses came from the hospital and health care sector. The smallest group of responses (111) were from the electricity sector. It is good to remember that the results of the survey are not necessarily statistically significant, but nevertheless give an insight into workers' personal experiences, to complement and contrast with the trade unions' visions.

The paper is divided into 5 main sections each containing a number of sub-sections. Section 2 "Setting the scene" maps the terrain and provides some background data on digitalisation in Finland in general and attitudes of the trade unions in particular. The third main section analyses the impact of digitalisation on job quality in three different sectors: the electricity (3.1), public administration (3.2) and health care sectors (3.3). In each of these, we will first give an overview of the sector and review the development of digitalisation and its present applications. Thereafter follow sub-sections on work organisation, working time, health and safety, skill requirements, reconciling work and family life, career prospects and workers' rights. This part is based on the digital survey and interviews with trade union representatives. The fourth main section deals with digitalisation and social dialogue. The first sub-section (4.1) here starts with a short contextualisation of the national system of industrial relations, followed by an examination of the role of digitalisation in industry-wide agreements (4.2). Sub-sections 4.3, 4.4 and 4.5 describe the trade unions' approaches to and priorities on digitalisation in the electricity, public services and hospital and health care sectors. The final sub-section (4.5) presents the main cross-cutting findings. Finally, the fifth main section of the paper provides recommendations for national and EU-level stakeholders.

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1. Kela is an acronym for the Social Insurance Institution of Finland. Kela is the most important social security organisation, responsible for all main social security programmes except for employment-related pensions, earnings-related unemployment insurance and work accident insurance (see Kela 2022a).

SECTION 2. SETTING THE SCENE

2.1 Digital performance

Finland ranks first on the 2022 Digital Economy and Society Index (DESI), a summary indicator on digital performance in Europe and in different EU Member States (European Commission 2022a). Finland's high score is based on good performances on the human capital, integration of digital technology and digital public services indices, as shown in Figure 1.

Figure 1.   Digital Economy and Society Index 2022.
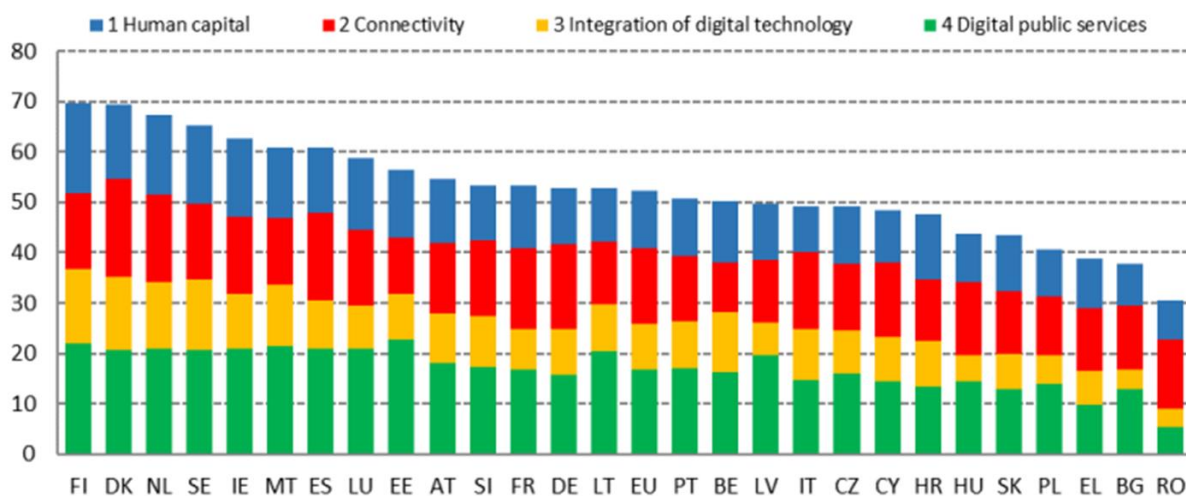
Source: European Commission (2022a).

In contrast to the comparatively high scores on those three dimensions, connectivity, i.e. the coverage of broadband networks, is less comprehensive in Finland than in many other Member States. Finland ranks 13th on connectivity, with 57% fixed broadband coverage. This is partly due to the high usage of mobile internet in Finland, with 4G networks close to saturation in certain areas and a lead in 5G readiness, with commercial deployments underway. There is a significant urban-rural divide. In particular, the sparsely populated areas in the eastern and northern parts of the country suffer from a lack of broadband connectivity. Next-generation access to broadband and fixed very high-capacity network coverage in Finland is low, while mobile network coverage is 100%.

Regarding digitalisation and gender, Finland ranks first on the Women in Digital Scoreboard. The Finnish educational strategy is based on lifelong learning. About 30% of the Finnish adult population in the age bracket 25 to 64 years of age take part in further education. The EU average is about 10% (Eurostat 2022). The Finnish adult education strategy is based on collaboration between public education institutions and education provided by enterprises. Overall, 20% of EU

enterprises provide ICT training and skills improvement for their personnel. In Finland, the figure is about 40%, which partially explains the high human capital DESI score. However, the problem is that those who already have high human capital tend to participate more in continuous education than those with lower human capital stocks (OECD 2021).

2.2 National digital strategy

Digitalised public services have rather a long history in Finland. The Social Security Institution of Finland (Kela) acquired its first computer in 1958 ([2]). Gradually, all data on social security issues were digitalised. Thanks to the individual social security number introduced in the early 1960s, it became possible to combine different databases to make public service processes more seamless.

In health and social care there is a specific digital service infrastructure (Kanta 2022), containing information on social welfare and health care, vaccinations and benefit utilisation. All information is available from the same source, allowing the service providers to offer their clients better and more accurate services. At Kanta, people themselves can check their own details (see Section 3.3.2)

Finland has also been one of the leading countries in the development of digital banking services (Lehti and Rossi 2017). Digitalisation is now a central part of private and public services and the public administration. Most services are available on the net. Information flows between organisations are mostly digital, and the national registers are extensively utilised in all services (Ministry of Finance 2021).

The Finnish national digital strategy aims at universalism: nobody should be left behind. The national artificial intelligence (AI) programme Aurora (started in 2019) is one milestone in that process. The activities of the different authorities and actors are organised to help people cope in various life situations and support relevant activities for companies, facilitating seamless service paths between the public and private actors, institutions and individuals (Ministry of Finance 2022).

There are several digital portals intended to fulfil the legislative stipulations on openness and availability of information. Suomi.fi (2022) is a general online source of all kinds of information for all people – a service channel where all Finnish public administration services and transaction channels can be found. The service is for residents, businesses and authorities. Pages are available in 12 languages. The Suomi.fi portal has been available since 4 April 2002.

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2. Kela is the most important social insurance institution, providing social security benefits to the Finnish population in all their life phases.

The government of Finland (2022a) published its visions for a digital Finland (Digital Compass for Finland). The publication emphasises the role of competitive and innovative business activities, high-quality expertise, broad-based education, people-oriented public digital services and safe and high-quality infrastructure. Achieving all the objectives requires better cooperation between the public and private sectors, universities, other research institutions, third sector organisations and social partners.

Regarding the administration of the national digital strategy sketched out in the Digital Compass, the Ministry of Finance steers its implementation in the public sector. Separate ministries are responsible for steering the development of information management and related projects in their own domains (Ministry of Economic Affairs and Employment 2021). The role of EU-financed programmes is limited.

The digitalisation of society in general, and the digitalisation of production modes in particular, will fundamentally change the old practices and ways of doing things. New modes of production and demand for new types of qualifications and skills may lead to social and labour market exclusion. However, there are more positive scenarios on a more inclusive society and labour market (see e.g. OECD 2019). The Finnish social partners share this more positive vision. In their joint monitoring report on digital transformation, trade unions acknowledge that the digital revolution will change the content of work in all professions. While some of the old tasks will disappear or be organised in totally different ways, new professions and tasks will arise to compensate for the destruction of the old ones (KT-lehti 2022). According to an extensive survey carried out by the Central Organisation of Finnish Trade Unions (SAK), 75% of those SAK members who had used digital tools said that digitalisation has not made their jobs obsolete and 22% said that some parts of their tasks have disappeared (SAK 2018).

A positive side of digitalisation is that digital technologies can be used to support inclusion of disadvantaged persons and help them take part in the labour market and be active in their society. In this process, the role of trade unions is crucial. All the central Finnish labour market organisations published a joint declaration on the trade union principles regarding digitalisation and AI ([3]). In their joint memorandum, the social partners emphasise that the strategy and its implementation must be built on ethical values of trust and inclusion. Thus, there is a shared vision among the social partners of the societal and inclusive role of digitalisation.

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3. Confederation of Unions for Professional and Managerial Staff in Finland (Akava), Confederation of Finnish Industries (EK), Commission for Church Employers (KiT), Local Government Employers (KT), Central Organisation of Finnish Trade Unions (SAK), Finnish Confederation of Professionals (STTK) and the State Employer's Office (VTML).

Prime Minister Sanna Marin's centre-left government (in office since 10 December 2019) launched the WORK2030 programme. WORK2030 is a development programme for work and wellbeing at work, aimed at reforming practices, making more effective use of technology, introducing working life innovations and enhancing work quality and wellbeing at work. The programme is carried out in collaboration with ministries, public sector institutions, as well as trade unions and employer federations. (Ministry of Social Affairs and Health 2021).

The EU's Recovery and Resilience Facility (RRF) gave the Member States new opportunities to invest in their digital transformation. Half of the Finnish Recovery and Resilience Plan (RRP) was targeted at climate and environmental projects. The allocation for digital purposes (28%) was close to the EU average (26%). The digital challenges specified in the Finnish RRP include upgrading the rail traffic management system, continuous digital learning, expanding broadband coverage and increasing digital applications in health care and employment services (European Commission 2022a: 9-11; and European Commission 2022b).

2.3 Research on the impact of digitalisation on job quality at the cross-sectoral level: state of the art

In the last fifteen years, about 140,000 jobs have disappeared due to automation and digitalisation. The most dramatic declines have taken place in in the numbers of workers in office and customer services, process industries, transport, construction, repair and manufacturing. Not surprisingly, those with higher levels of education in office positions are much more likely to find higher-paid expert work than those in routine industrial work. A substantial share of routine industrial workers end up in worse positions than those that they previously had, or even stay unemployed (Maczulskij 2020).

According to Statistics Finland's 2018 Quality of Work Life Survey, 90% of wage and salary earners use digital applications at work. The Quality of Work survey, based on 4,110 employee interviews, showed that about half (41%) of Finnish employees cope well with the introduction of digital modes of work. The lion's share of this group of 'skilled users' are in the age bracket 25 to 44 years of age. For them, digitalisation has typically increased the efficiency of work, access to information and knowledge. They see digitalisation as an opportunity, and it has even reduced the workload and improved the characteristics of their jobs (Tuomivaara and Alasoini 2020).

The second group of employees comprises those who experience some problems and may feel 'digital stress'. According to the 2018 working barometer produced by the Central Organisation of Finnish Trade Unions (SAK 2018), close to 40% of the members of the SAK at least sometimes felt that they were 'at the mercy of technology'. Some 10% of employees are in 'user gaps', they either do not have the proper skills to handle the digital transformation or do not use digital tools at all (Tuomivaara and Alasoini 2020).

SECTION 3. IMPACT OF DIGITALISATION ON JOB QUALITY

In this section we provide analyses on digitalisation and its consequences in three sectors of economic activity. We are mainly interested in the connection between digitalisation and characteristics of jobs (job quality, security of employment and career prospects, health issues, time use and workers' rights). Except for the two opening sections (overview and history, and patterns of digitalisation in the sector in question), the presentation in each sectoral analysis is based on quantitative data collected via the project's online survey and via qualitative interviews as well as focus group discussions with representatives of trade unions and grassroots employees.

Section 3.1 The electricity production and distribution sector

3.1.1 Overview of the sector

The Finnish energy production sector encompasses about 120 electricity-producing companies and about 400 power plants, more than half of which are hydroelectric power plants. The electricity production system in Finland is quite decentralised compared to those of many other European countries. Whereas the flip side of the decentralized system is that there may be coordination problems between the many different actors, the positive side is that the versatile and many-sided structure increases the security of electricity supply. About 80% of Finnish electricity consumption is covered by domestic supply. The rest is covered by energy imported from Sweden and Norway. (Statistics Finland 2021).

In 2019, the total energy sector employed about 42,000 persons, corresponding to about 2% of all employees in the country. Regarding the energy-producing subsector specifically, the number of employees was about 18,000 persons (corresponding to 0.8% of all employees in Finland). Half of them were employed in electricity production, 5,000 were in heat production and 4,000 in steam-based production. Direct operating activities in energy production employ about 15,500 people, and about 2,500 additional persons work in investments and in other indirect services.

The largest employment impact comes from electricity distribution network operations, which employed about 11,500 persons in 2019 (GAIA Consulting 2021). The electricity industry is crucially involved also in the construction business. One fast-growing branch of the electricity sector is Internet of Things (IoT) property maintenance, including devices for controlling and steering various processes (such as heating, access to offices, efficient use and consumption of electricity etc.) in real estate and buildings.

3.1.2 History and patterns of digitalisation in the sector

The expansion of electricity throughout the whole country took place after the Second World War. During the post-war rebuilding period in the 1950s and 1960s, new hydroelectric power plants were built. The first nuclear power plants were built in the 1970s. By now there are four nuclear

power-based plants in use. In the most recent decades, there have been strong investments in wind and solar energy. For the time being their share of total electricity consumption is rather small (10% and 1%, respectively) (Business Finland 2021).

Digitalisation has transformed the whole electricity sector. There are now new ways to distribute energy and service customers. One important potential implication of digitalisation is its ability to break down boundaries between energy subsectors, enabling integration and cooperation between various actors and systems. This kind of interconnectivity makes it possible to optimise supply and demand in real time. Nowadays, the Internet of Things (IoT) and other advanced artificial-intelligence solutions are important in exchanging data, goods, and services.

The following quantitative analyses are based on the project's digital survey that yielded 111 responses (only) for the electricity sector. Thus, the results should be treated more as indicative than confirmatory. More than 80% of these respondents work in the private sector, while the rest are employed in semi-public or public enterprises. The sector is heavily biased towards males (92% of respondents). Most of the employees (94%) have secondary-level educational attainment. Almost all work full time on permanent employment contracts. 81% classify themselves as highly skilled technicians or professionals.

Regarding the use of digital tools (such as mobile devices, smartphones or tablets), 87% of the respondents use these devices regularly. The main tasks reported are related to communication with colleagues (65%), planning and scheduling of work tasks (59%), monitoring (54%), measurements (48%) and interacting with users (30%).

3.1.3 Work organisation

The lion's share of respondents neither agree nor disagree with the statements on potential changes set out in the digital survey. For example, half of respondents say that digitalisation has not affected their job satisfaction and choose the neutral 'neither-nor' alternative when evaluating the impact of digitalisation on the quality of services provided to the end-users. This may indicate that digitalisation has not had that much impact on the content of electricians' work tasks. This said, even with these neutral responses, there are differences in emphasis between the positive and negative experiences of digitalisation. On the positive side, about half agree that digitalisation has improved job quality, productivity, cooperation and coordination of tasks with colleagues, as well as possibilities to focus on significant aspects of the job. However, many (50%) believe that digitalisation has increased the pace and intensity of their work.

There is a strong opinion that digitalisation has not increased wages in the electricity sector. Regarding the more subjective aspect of job quality, about half (46%) think that digitalisation has

neither improved nor reduced their job satisfaction ('my job is better now'), but 40% say that their job has become more interesting and attractive than it was previously.

3.1.4 Working time

According to the Act on Working Hours (872/2019), regular working hours may not exceed eight hours per day and 40 hours per week. Weekly regular working hours can also be arranged for an average of 40 hours within a maximum period of 52 weeks. The collective agreement for the technology industry (SSA 2020) gives the possibility to reach different agreements locally, for example, on the maximum length of daily and weekly working hours, or on a year-long equalization period with a 'working time bank' agreement.

Two interpretations presented here are based on Appendix Table 2. The first stresses the status quo. Many of the electricians do not see any correlation between digitalisation and changes in working time. The other story is gloomier. About one fifth of respondents report that digitalisation has increased working hours, unpaid overtime and unsocial working time. Furthermore, about 40% report that they need to spend more time online to manage their professional life.

3.1.5 Health and safety and outcomes for workers

All legal residents are universally insured against health care costs and loss of income due to illness. In the case of sickness, the statutory sickness insurance compensates about 70% of loss of income. On top of the statutory insurance, employers are obliged to provide sick pay. The generosity and duration of sick pay varies according to the labour market contract and the duration of the employee's employment contract. In the electricity sector, the compensation for loss of income is 100%, varying from four to eight weeks (SSA 2020). After the termination of the sick pay period, the claimant is entitled to the statutory sickness and rehabilitation benefit (Kela 2022b).

In each workplace there must be an occupational safety and health representative who represents all the employees in discussions on their occupational safety and health issues (Act on Occupational Safety and Health Enforcement and Cooperation on Occupational Safety and Health at Workplaces (44/2006)).

The survey among the members of *Sähköliitto* reveals that there are some problems linked to digital work processes. 20% of the respondents say that digitalisation has had negative impacts on their physical health. In addition, 20% of respondents report that their mental health has deteriorated. Back and neck pains are the most reported physical symptoms (about 20 % each), followed by physical fatigue, headaches and pain in the hands (about 10 %). As regards mental health, stress, mental fatigue and demotivation are the most common problems, which affect

about 15 % of the respondents. However, if we look on the positive side, about 70% say that they have not noticed any physical or mental problems related to digitalisation (Appendix Table 3).

3.1.6 Skills and learning

Work in the electricity sector is very diverse, demanding and constantly evolving. Oftentimes the skills needed are acquired in the workplace, either through learning by doing or through extensive further education provided by the employer (SSA 2020). According to the survey, 92% of respondents had secondary-level education and the rest had tertiary-level educational attainments. Whereas as many as 70% of those respondents who needed new digital skills say that they achieved those skills either through employer-provided training or learning by doing, the rest say that their vocational education gave them sufficient skill levels.

There seems to be a need to improve the target efficacy of employer-provided education: half of the respondents report that employer-provided training has not sufficiently taken into consideration the employee's needs. On the other hand, the other half indicate that the training has strengthened their skills (Appendix Table 4), although a quarter complain that there was neither enough time nor resources dedicated to training.

3.1.7 Reconciling work and personal life

In the Finnish family leave system, each parent has a quota of 160 days. The parental allowance is paid for about 14 months per child. Parents can transfer up to 63 days from their own quota to the other parent. On average, the public benefit amounts to about 70% of the parent's annual income. Childcare is politically defined as a subjective right for children – for low-income families, childcare is free of cost. The highest fee in municipal day care centres is €288 per child per month (Kela 2022c).

Electricians' opinions on the work-family life balance are divided. For example, whereas one third think that digitalisation has not increased personal or family time, almost the same share says that it has had a positive impact. In contrast to the divided opinions on those items, the answers to questions on teleworking are clearer. The 'neither nor' option in the online survey is overwhelmingly the most common response on whether teleworking impacts household duties or the boundary between work and personal time. Two fifths say that teleworking blurs the boundary between work and personal time (Appendix Table 5).

3.1.8 Career prospects and employment security

Employees in the electricity sector express divided opinions on the impacts of digitalisation on the future of employment, their career prospects and employment security. 43% of respondents have a positive view of the overall employment effect of digitalisation (28% are sceptical). Regarding

confidence in their own future prospects, about one fifth are negative – the same share see their prospects as positive, and the rest are neutral.

One central task of trade unions is to try to improve the employment security of their members. Half of the respondents say that they do not know whether their union has been effective at improving job security and a quarter think that their union has not been effective at all.

3.1.9 Workers' rights

At a general level, workers' rights are defined in the Act on Employment Contracts (2001/55) and the Act on Working Hours (872/2019). Collective employment agreements provide more specific stipulations on workers' rights to consultation, rights regarding working time arrangements (including the right to electronic downtime), as well as other aspects of employment in the sector in question. For the electricity sector, the relevant collective agreement follows broader collective agreements negotiated for the technology branch between the Industrial Union [*Teollisuusliitto*] and the employer federation Technology Industry [*Teknologiateollisuus*] (Teollisuusliitto 2022).

There seems to be considerable ignorance on the information processes linked to planning, designing and implementing digitalisation of work processes and tools at the workplace. Depending on the case, 50-60% of the respondents admit that they do not know if any information was provided, or how information on the digitalisation process and its implementation strategy was transmitted. Thus, the picture provided concerning the information given is a bit gloomy.

3.1.10 Conclusions on the sector

The use of digital tools is rather common in the electricity sector. Opinions on the pros and cons of digitalisation are balanced. The respondents do not see a strong correlation between digitalisation and the content of their work. Digitalisation is seen to somewhat improve productivity and the quality of services. There have been no major changes to work time. However, a significant proportion of respondents report some problems in reconciling teleworking with various household tasks. Furthermore, information sharing is quite limited, and there seems to be rather widespread ignorance on how digital tools and work processes have been introduced. The survey also reveals that training and development of skills needs to be strengthened and more closely tailored to the needs of employees.

Section 3.2   The public administration sector

3.2.1   Overview of the sector

The Finnish public administration consists of three different levels (central government, 22 regional welfare counties and 309 municipalities). In 2019, the Finnish public sector had 669,000 employees, i.e. 30% of all employees. 71% of public sector employees were women. The central government employed 138,000 people (49% women), and the remaining 531,000 public sector workers (77% women) were employed by the municipalities (Statistics Finland 2020).

3.2.2   History and patterns of digitalisation in the sector

The digitalisation of public sector services started decades ago. Already in the 1980s, Finland moved to a fully digitalised census. The centralised, high-quality population register made this possible. Finnish taxation happens automatically; there is no need to approve one's tax declaration if the information is correct, and if not, the data can be corrected remotely. Finland has built the national digital service architecture to improve cost efficiency and connectivity in the entire public sector. The Suomi.fi services (Finland.fi) are a toolbox of commonly used digital services, such as e-ID, authorisation services, digital post, etc. and act as a one-stop shop for the various public sector services. In 2019, a comprehensive income register became effective. It is used by the tax authorities and social security institutions. In practice all social security benefits (e.g. those paid by the Social Insurance Institution of Finland, Kela), taxation and other functions of public authorities can be managed via the internet. The internet reduces the distances in a country such as Finland, which is geographically large but sparsely populated. Although internet coverage is comparatively good in Finland, there are still people with no access to the internet at home. There are ambitious plans to rectify this situation and to develop a service network based on artificial intelligence applications. The programme, AuroraAI, aims to guarantee seamless access for citizens to services (Section 1.2.2).

As a rule, all institutions responsible for social security provide information on their benefits, who is eligible, what the conditions are and the levels of the benefits. Information is available on the internet, in paper form, at service numbers via telephone, and via face-to-face contacts at the office of the insurance institutions or their joint service points ([4]). In most cases, online benefit calculators are also available to see whether claimants might be eligible for various benefits and how much (in Euros) they could receive (Kela 2022b). Furthermore, most public service providers also use chat-bots.

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4.   For multi-sectoral services, there is a common register for the Employment and Business Service Offices (TEOs), Kela, and the municipalities.

3.2.3 Work organisation ([5])

The great majority (95%) of the respondents work in public institutions, and the rest in semi-public organisations. Over 40% classify themselves as skilled professionals, medium-skilled clerical workers (34%) or highly skilled professionals (11%). More than 90% have permanent, full-time employment contracts. The rest have fixed-term or other forms of contracts. The gender distribution is biased towards women (84%) and older respondents (53% are older than 55 years of age). Most of the respondents have lower or upper secondary educational attainment, and about one fifth have achieved a post-secondary or university degree.

The utilisation of digital tools is widespread. Virtually all public employees report that they use digital devices. The main categories of use are sending and receiving e-mails (90%), planning and scheduling work tasks (75%), communicating with colleagues and internal or external service providers (73%), interacting with customers (54%), monitoring performance of work tasks (47%) as well as obtaining data (47%). Digital devices are frequently also used for online training and learning (66%).

> *In most public sector services, a 'digital office' is in use. In that virtual office, the employee has a list or queue of customers. The digital program always 'feeds in' a new customer when the previous one has been dealt with and the decision is finalised. The virtual office is not bound to place and time.* (INT 9)

Public employees' opinions on the impact of digitalisation are much more positive than those of the electricians (Appendix Table 6). For example, sizable majorities report that digitalisation has improved their job quality (68%), increased productivity (69%), improved possibilities to schedule work tasks (63%) and improved working conditions (62%). The responses on most other impacts of digitalisation are also more positive than negative. The flip side to this is that a large majority (72%) believe that digitalisation has increased the pace and intensity of work. The verdict is very much in line with the picture we obtained in qualitative interviews. Thus, one respondent explained: '*I would say that now, with digitalisation, it is much easier, faster and clearer to carry out our main tasks than during the 'paper time'. We have access to data files containing most of the information we need in our work. This means that we need to ask for less documents from the customers. It is less bureaucratic*' (INT 10).

Most communication between colleagues and between different public services is done on the net. However, there are some differences between the age groups in their views on how digitalisation

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5.   In the public sector, the digital survey was sent to 56,842 employees, producing 1,251 responses. It is not possible to satisfactorily evaluate the representativeness of the survey, but the sample size is big enough to allow reliable statistical analyses.

has affected their work and cooperation and collaboration with their colleagues. As one older employee put it: *I must say that I belong to that generation who pick up a phone and ask a colleague rather than using emails or other digital devices to get information. I think that it is much more convenient and intimate'* (INT 7).

An interesting and important aspect came up in a focus group discussion: digitalisation tends to individualise the processes of dealing with benefits and the final decisions on them: '*One problem in digital services is that decisions are individualised. Previously customers were handled in teams and often the teamwork was more effective'* (INT 11).

3.2.4 Working time

In most public sector offices, flexi time is used, i.e., within certain time frames, employees can choose when they work. Working time is digitally monitored. When the employees start working, they sign themselves into the system. When they stop working, they log out. Digitalisation is not perceived as having impacted working time much (Appendix Table 7). However, almost 60% of public sector workers report that monitoring has intensified.

The most significant changes are reported to have taken place regarding commuting from home to work. Although many respondents believe that the situation is unchanged, and many others report positive changes, some negative responses were also made. Working hours (15%), unpaid overtime (15%) and unsocial working hours (19%) are reported to have increased. One explanation for why unpaid overtime work has increased and breaks for rest have decreased is the disappearance of assisting personnel. Many of the work tasks that previously were taken care of by assistants and secretaries have been digitalised and are now performed by the employees themselves. As one focus group participant explained: '*In our branch, there used to be secretaries taking care of running tasks, for example helping with travel, booking hotels, organising data files, obtaining the information needed, etc. Now employees do everything themselves. Often such operations are done outside the official working hours'* (FG2).

3.2.5 Health and safety and outcomes for workers

Section 3.1.5 gave a short overview of the health care provision guaranteed for employees in the legislation. The legislation stipulates the minimum level of benefits. Employers have freedom to organise better employment-related health provision than the minimum, and public sector employees tend to have better occupational healthcare provision than private sector employees.

Digitalisation has caused both physical and psychological problems. Whereas 47% of respondents have not noticed any changes or problems, 25% say that they have new physical pain symptoms, and 17% say that pre-existing health conditions have worsened. The most common problems are pain in the neck, back, hands, vision problems and physical fatigue.

About 70% of our respondents report no current psychological problems. However, 15% have new problems which they attribute to digitalisation, and a further 9% report that pre-existing problems have deteriorated. Stress is the most common problem, followed by mental fatigue, overwhelming emotional demands, as well as demotivation and anxiety.

Interview results indicate that teleworking has reduced sickness absence in the public service sector. As one respondent explained: '*Teleworking has decreased sickness absences. During the pandemic it was not possible to be at work if you were coughing or if your nose was running. Especially open-plan offices were bad in that sense, whereas when teleworking at home, it did not matter*' (INT 7).

3.2.6　Skills and learning

Almost all respondents say that new skills are required in their everyday work. 28% already have all the skills needed. The rest need to upgrade their digital literacy, general and specific skills (24%) or only specific skills (43%) to properly manage their jobs. The employer-provided training has mainly (32%) covered specific tools needed at work, or a combination of general and specific skills (26%). The problem is that in most cases the training is conducted online, as two interviewees explained.

> *The employer provides training on the utilisation of new digital tools. In most cases, training courses are on the net. Then, there you sit alone and try to figure out what to do.* (INT 8)
>
> *The process is rather top-down. The employer decides what software will be used, and there is not that much negotiation about the issue. Employees must adapt themselves and try to learn. There are tutorials but as a rule they are on the net. The employee tries on her own time to learn how to use the new programs.* (FG 1)

Also, public sector workers report some problems in matching training with the needs of employees. Nevertheless, almost 80% are of the opinion that training strengthened their skills and career prospects and almost half think that training opened new career opportunities. (Appendix Table 9).

3.2.7　Reconciling work and personal life

The Finnish social protection system, supporting the reconciliation of work and family life, is described in Section 3.1.7. Regarding the work-life balance, public sector employees are rather positive about their ability to combine work and family life. One reason is teleworking. 74% report that they have the possibility to telework (as a rule) in their own homes. The number of weekdays available for teleworking varies greatly. About one third say that they can telework for five days a

week, an additional one third telework 3-4 days per week, and the rest have 1-2 teleworking days per week.

The public service sector respondents see the impacts of digitalisation upon the work-life balance in a positive light: 67% say that digitalisation has affected their work-family balance positively, and half of the respondents are of the opinion that digitalisation has increased their personal and family time. Furthermore, teleworking is depicted in a positive light. Similarly, when asked if it is difficult to combine teleworking at home with household responsibilities, almost half of the respondents say no. Interview responses support this finding: '*Teleworking gives some degree of freedom. You are there, for example, when children go to school and when they come back from the school. When you take breaks from your work, you can put the washing machine on and take care of the laundry*' (FG 2).

In sum, digitalisation and its impacts are described rather positively both in the digital survey and in the interviews.

3.2.8   Career prospects and employment security

Digitalisation is seen to positively affect career prospects and employment security (Appendix Table 9). This is how one interviewee describes digitalisation boosting employment and improving the quality of services: '*Our work and the future of work very much depend on our ability to use digital possibilities in various public and private services. In Finland, geographical distances are huge. In particular in the northern part of the country, most of the services must be based on the internet instead of on the client travelling hundreds of kilometres to the service office. Digitalisation is a win-win solution for all*' (INT 9).

A substantial share of public employees (50%) say that they cannot assess how successful their trade unions have been in combatting the detrimental impacts of digitalisation. Whereas 30% think that their unions have not been effective at this, 20% are more positive. Digitalisation also improves their unions' possibilities for interest representation, as one focus group participant explained: '*It is difficult to say how we have managed to cushion the possible negative effects. When it comes to the trade union's possibilities to represent their constituencies, digitalisation gives better possibilities. You do not need to travel to participate in meetings. Everything can be done online*' (FG 1).

3.2.9   Workers' rights

The general principles regarding workers' rights to be informed and to have electronic downtime, as well as the legal and contractual bases for these rights, have been discussed in Section 3.1.9 above. The digital survey gives a somewhat gloomy picture of the formal employer-based regulation of workers' right to electronic downtime. 25% say that they are required to take breaks

and 20% have access to psychological support. But only 10% of the respondents report that other institutionalized aspects of electronic downtime (e.g., a charter of good practices, training in time use management, employers' rules for downtime etc.) are in place.

However, this is not necessarily a major problem, in the light of the abovementioned findings on work-life balance. 45% do not feel any pressure to be connected, and 30% say that connectivity is a personal choice. When working at home, it is possible to take breaks and to make the workload less heavy, as one focus group participant explained: '*We do not have any problems with employees' rights to disconnect themselves. Our flexi time gives us possibilities to adapt our time use within a certain time frame. The situation is totally different with supervisors and managers. They seem to have problems disconnecting*' (FG 1).

There is ignorance of the information processes and procedures in their workplaces. About 80% do not know if formal information has been sent out on the planning and design of digital work processes and tools at the workplace.

3.2.10 Conclusions on the sector

The public sector employees we interviewed often referred to the SDC CGA Framework agreement on digitalisation (2022), which sets out issues and processes linked to digitalisation of work. They emphasised that in the Finnish context, compliance with the agreements is not a big problem. In most cases the situation is satisfactory. However, there are some issues. The biggest problem is that employees are not properly informed on the needs for and forms of the new digital technologies that employers will implement.

The overall view of digitalisation in the public administrative sector is positive. Digitalisation is regarded as a necessary tool to serve clients and to improve productivity. Most respondents think that digitalisation is not a threat to employment in general or their employment, and digitalisation combined with teleworking is seen as giving possibilities to better reconcile work and family life.

One intriguing finding concerns the use of artificial intelligence and partially robotised decision making in public services. As one interviewee expressed it:' *We get almost all the data we need for our decisions on the clients' benefits and in fact our decision-making is automated to such an extent that when all the lights are green, we cannot change the automated decision. Then the big issue is who is responsible if the decision happens to be wrong*' (INT 7).

Section 3.3 The hospital sector

3.3.1 Overview of the sector

The majority of hospitals in Finland are public. University hospitals and the central hospitals of the hospital districts are responsible for the most demanding medical operations (InfoFinland 2022). The social and health care sector employs about 400,000 persons.

3.3.2 History and patterns of digitalisation in the sector

An individual social security number for each Finn was introduced in 1962. Since that year, a huge amount of data – including data on health, utilisation of health care, vaccinations, medicines, etc. – has been gathered on individuals. Electronic patient records reached 100% coverage of the population as early as 2007 (Reponen et al. 2021). Processing and analysing the data repositories give possibilities for a digital health revolution and, at the individual level, opportunities to provide help in addressing patients' problems.

Finland has had a National Archive of Health Information (Kanta) in use since 2014. The national data system provides for electronic prescriptions, a pharmaceutical database, clients' own pages and a patient data repository. All health care units use it. Individual users can seek their personal health and health care information. The digital repository is invaluable from the health care provider's perspective. Medical doctors or hospitals providing health care can see the medical and sickness records of the patient. In emergency situations, this in an essential asset (Kanta 2022).

There is a wide variety of digital health care applications in use. For the individual, these e-portals give access to combined digital public social and health care services, also via mobile phones. The development of these applications opens up possibilities for digital medicine, no longer requiring physical encounters with a medical doctor or other health care personnel (Apotti 2022). Furthermore, merging personal health data (My Data) that individuals themselves collect through their activity bracelet, sport watches etc. facilitates more personalised, preventive, and predictive health care services (OYS 2022).

The Covid-19 pandemic accelerated the development of digital health care. Many services that were previously based on face-to-face consultation were transferred online. For example, most medical consultations, psychotherapy services, etc. now began to be carried out via the internet. Thus, the extraordinary circumstances of the pandemic created an avalanche of new forms of digital health care.

3.3.3 Work organisation

In the digital survey, there were 809 answers from employees working in health care. 84% of the respondents are women. The age structure of the employees is heavily skewed towards the older

age groups: over half of the respondents are older than 55 years of age. 80% work in public companies and about 20% in private companies. Regarding educational attainment, the majority (80%) have secondary-level diplomas and the rest have tertiary-level education. Two thirds classify themselves as skilled professionals, and the second biggest group, low-skilled elementary workers, comprise one fifth of respondents. In the Finnish health care sector, permanent (88%) and full-time (83%) employees are the norm.

Almost all the respondents regularly use mobile devices at work, such as laptops, smartphones and tablets. They are mainly used to communicate with colleagues (52%), plan and schedule work tasks (42%), to monitor performance of work tasks (34%), interact with service users (32%) and to measure data (24%). The use of machines operated by digital commands to perform certain physical tasks is much less common (Appendix Table 11).

In many items presented in Appendix Table 11, there is more emphasis on the negative sides than on the positive sides of digitalisation. For example, most health care workers believe that digitalisation has undermined the quality of services and report weakened possibilities to focus on significant aspects of their jobs. On the positive side, however, significant shares of health care workers believe that digitalisation has improved the coordination of tasks with colleagues, working conditions, and the quality of jobs. Thus, there are diverging opinions, as these three respondents illustrate:

> *Nowadays, there are many more demands to report what we are doing with our patients. On one hand, the increased demand for reporting is partially caused by legal obligations to report everything. On the other hand, reporting is linked to digital sharing of information between different actors in the social and health care sector. The flip side is increased workload and feelings that we have to engage in secondary tasks instead of concentrating on what we really need to do. All this increases the workload.* (FG 3)
>
> *Digitalisation has produced lots of good things in our work. For example, we can in advance see patients' histories, i.e. which kind of sicknesses they have had, which kind of medicine they are getting, etc. The problem is that we have a couple of digital systems, good in themselves, but the problem is that they do not properly communicate with each other.* (INT 1)
>
> *When we, long ago, got our first computer-based systems, we had first to write down reports by hand on paper and afterwards feed the information into the digital data storage. Now the situation is much better. We can have our laptops or mobile phones that can even transcribe what is spoken.* (INT 4)

There is a belief that digitalisation is good for society in general, and also has a positive impact on the general level of employment. General questions on societal impacts produce more positive

answers than more specific questions on impacts on the worker's own job. As in the case of public services, digitalisation also opens up new possibilities for remote medicine:

3.3.4 Working time

Most of the respondents (84%) work full-time, and only 16% are part-timers. Digitalisation has not changed working time arrangements that much in most respondents' view – therefore, between 80% and 90% of all responses were 'neither-nor' answers, though not to the question dealing with breaks. The overall situation is viewed by most as unaltered, with fewer seeing changes in any given direction (Appendix Table 12). Teleworking is not much used, as one interviewee explains: *'In our occupations there are not that many possibilities for teleworking, as in some other occupations that are not based so much on personal face-to-face encounters and physical closeness and intimacy. Our occupation is with care tasks'* (INT 5).

About one fifth of the respondents report increases in working hours and paid overtime due to digitalisation. A quarter of respondents report reductions in breaks and rest times. It is difficult to say if these changes are more related to the Covid-19 pandemic than to digitalisation. Digitalisation seems to be at least partly implicated in increased working hours and increased overtime. But the overall picture here once again is that health care workers believe that digitalisation has most likely had no impact on working time.

3.3.5 Health and safety outcomes for workers

The framework of the Finnish occupational health care and safety system was described in Section 3.1.5. The task of the occupational safety and health representatives is to keep an eye on issues related to environmental health, employees' wellbeing, and working hours, as well as preventing bullying, harassment and different forms of violence.

There are hopes that digitalisation will make work tasks easier and help to make the work processes less tiring. However, answers given to the question 'Do you feel that the introduction of digital tools and methods in your daily routine has had an impact on your physical health?' indicate the opposite. About half of the respondents say that they have not noticed any deteriorations in their health status linked to digitalisation, while about one third feel that digitalisation has either brought new physical symptoms or worsened pre-existing physical health problems. The most frequent physical problems are pain in the neck, hands, head and eyes.

Regarding psychological problems, 70% have not noticed any consequences of digitalisation for these, whereas a quarter report that their mental health has worsened. Problems reported include stress, as well as mental fatigue, anxiety, demotivation and overwhelming emotional demands (about 10% for each problem category). Some focus group participants also point to problems: *'There is digitally steered equipment that would help employees, for example in lifting or carrying*

heavy patients. But oftentimes it is faster to do everything by hand. Because of the constant time pressure, those fancy help devices are not always used' (FG 1).

Appendix Table 13 summarises opinions regarding harassment and bullying. About half of the sample think that digitalisation has increased monitoring of employees by their supervisors. The positive side is that about one third of the respondents think that harassment and various forms of violence have diminished because of digitalisation, whereas less than one fifth see that harassment and violence have increased. Regarding the latter two problems, it is however difficult to disentangle the impact of digitalisation from that of many other factors.

3.3.6   Skills and learning

In the health care sector, rapid technological development is taking place. The issue is, then, whether and to what extent employees can handle all the new digital devices. According to a study on digital skills among nurses, 90% of those who handle patient registers in primary health care report that they are competent in digital skills (Reponen et al. 2021; Vartiainen 2021). However, the constant change requires new skills. Consequently, 72% of our respondents believe that they must improve their skill levels. Mostly, people report that they need specific skills.

Many employees, particularly nurses, must use several different registers and platforms. They must look for information on medicines and previous sicknesses. Sometimes there are different platforms that doctors use when writing medical prescriptions, or that nurses use in calibrating drug dosage during practical nursing work. This may cause confusion, as one respondent explains: *'Sometimes when I see in my device what the medical doctor has prescribed in his platform, then I contact the doctor and ask if he really meant what he has written. Usually, it appears that the doctor has forgotten to think through some essential point and that things have gone wrong. But happily enough, we have this double checking possibility. I have taken a special module in medicines and I know those things rather well'* (INT 2).

The problem with employer-provided training and education, also in health care, seems to be that workers perceive mismatches between their needs and the education offered (Appendix Table 14). Almost half or our respondents criticise the education and training they have obtained, saying that their needs were not sufficiently taken into consideration. Nevertheless, the same share think that training strengthened their skills and career prospects.

3.3.7   Reconciling work and personal life

There are substantial differences between the public sector and health care sector employees in the use of teleworking. Whereas about 80% of people in public services reported that they have access to teleworking, a similar share of health care employees say that they *do not* have such possibilities, and those who have the possibilities tend to report only one or two days per week

available for teleworking. As one respondent explains: *Our jobs do not give many possibilities for teleworking. You take care of your patients at your workplace, in my case at the hospital. Sometimes, I can do some digital 'paperwork' at home, but it is rather rare'* (INT 6).

Whereas one third of the health care workers surveyed disagree with the statement that digitalisation has increased personal and family time, two thirds think that digitalisation has had no impact on time use.

3.3.8   Career prospects and employment security

Most respondents report rather good career prospects and employment security in the health care sector. There is currently a 'nurse deficit' of 15,000 people. In other words, it is projected that at least this many nurses and practical nurses will be needed in municipal health and long-term care services, and the deficit is rapidly growing larger (Kangas 2022). Nevertheless, opinions on the impact of digitalisation on job security and future employment prospects are divided. There are approximately equal numbers of responses agreeing and disagreeing with the statement that digitalisation will improve the respondent's own job security, and digitalisation is seen to generate general rather than individual positive effects. Interviews also reflect mixed opinions: *'In principle the employment prospects in our branch are good, but they do not necessarily have that much to do with digitalisation. There is a huge lack of care personnel. In a country like Finland, we need digital services to guarantee access at least to remote services. However, there are some worries. Salaries in our branch are rather low, and the Sote reform causes questions. Thus, although the employment prospects as such may be good, there are lots of worries and problems'* (FG 3).

3.3.9   Workers' rights

Probably linked to the characteristics of the work in the health care sector, about 40% of the respondents say that they do not need to be available outside of working hours. One fifth of respondents log in from home by personal choice, and one third of the respondents do not feel any pressure to be electronically available outside working hours. The interviews also report a rather permissive situation: *'Personally, I feel that I do not have any problems with connectivity or possibilities to disconnect. When I leave the hospital, I am disconnected. If I want to be connected it is totally my own choice'* (INT 3).

Health care workers have similar perceptions to workers in other sectors regarding whether relevant information has been provided on digitalisation strategies and implementation of specific tools needed in the work process. Relatively few respondents state that information has been given, and most of the respondents are unaware if such information has been given at all, or if their workplace has adopted a digitalisation strategy.

3.3.10 Conclusions on the sector

Digitalisation is a fundamental part of the Finnish health care system. There are various registers with abundant data and other information important and useful for proper care of patients. In fact, in primary and specialised care, all relevant data are digitally available. The problem is in smoothly combining social and health care databases and transferring personal data from one sector to another.

The Sote reform came into effect on 1 January 2023. There are now 22 larger entities (21 welfare counties and the city of Helsinki). The overarching goals of the Sote reform are to strengthen the financial basis for service delivery, to guarantee equal access to health social services, and to reduce inequalities in health and wellbeing (Ministry of Social Affairs and Health 2022b). Certainly, Sote will make flows of information between different sectors and actors more seamless. However, there will still be major problems. Many welfare counties have their own digital systems, but these different regional systems are not fully compatible with each other (Government of Finland 2022b). It remains to be seen what the long-term impact will be upon employees and customers.

Section 3.4 Overall sectoral cross-cutting conclusions

The project's online survey shows that almost every employee in all the three sectors uses some kind of digital devices. But there are differences between the sectors regarding how the skills needed in digital work processes are acquired. In all of the sectors, the highest share of respondents state that the reason why they need training is to acquire special skills in using work task-specific tools and software. One third in each of the three sectors share that opinion.

The public sector employees have the most positive view of digitalisation and the possibilities that digitalisation provides for reconciling teleworking with family life. Public sector employees can telework more often than employees in the health care and electricity sectors.

One of the most important aspects of work is whether one's work is interesting. Table 1 below presents how the respondents in the three different sectors see the impact of digitalisation and whether digitalisation has made their job more interesting and attractive. Whereas there are no major differences between the electricity and hospital sectors, there are statistically highly significant differences between the public administration and the other two sectors. In the public service sector, digitalisation is seen as a necessary and basic tool to serve clients. By contrast, in health care, employees often feel that digital processes actually interfere in the relationship between them and their clients, and they are much more likely to believe that the time they spend on digital operations takes away time from their basic job, taking care of their patients. In public services, the basic milestones for carrying out one's job are easier to digitalise. Thus, digitalisation and digital tools more often provide effective ways for public service workers to help their clients.

Table 1.   Has digitalisation made your work more interesting? (%)

	Electricity	Public services	Health care and hospitals
Strongly disagree	18	6	18
Disagree	13	13	19
Neither disagree nor agree	32	19	28
Agree	30	31	24
Strongly agree	7	32	12
χ^2= 147.79; sig. = .000.			

Source: DGQS 2022, q23_5 by q7.

As stated above, public service employees are the most satisfied with digitalisation, followed by health care workers. The lowest positive values are found in the electricity sector. The picture is largely the same regardless of whether we look at the perceived impacts of digitalisation on individuals or more generally. However, within each sector, respondents are more negative about the personal impact of digitalisation than about more general impacts of digitalisation, on society or employment. The respondents understand the importance of digitalisation and the digital economy, but they do not immediately see positive effects of the process in their own life and working conditions.

Not surprisingly, opinions on digitalisation are linked to occupational status, but surprisingly, the relationship is not linear. Those in the lower levels of the hierarchy tend to have more negative opinions of digitalisation. Highly skilled professionals and highly skilled technicians have the most positive views on digitalisation. Interestingly, skilled professionals and skilled technicians display surprisingly low values. Their values are lower than the values for moderately skilled clerical workers.

SECTION 4. IMPACT OF DIGITALISATION ON SOCIAL DIALOGUE

Section 4.1 Introduction: contextualizing the national system of industrial relations

In order to place the Finnish case in a broader frame of reference, we briefly describe the Finnish model of social corporatism. Finland belongs to the Nordic welfare state model exemplified by comprehensive and generous welfare provisions, high tax rates, and low levels of inequality, poverty and social exclusion (for example, Kautto and Kuitto 2022).

One of the most important trademarks of the Finnish welfare model has been tri-partite collaboration between social partners and the state (Kangas 2007). The pre-requisites for well-functioning collaboration were strong and unified employer and employee organizations, with the capacity and will to conclude social accords. In broader categorizations of welfare capitalism, Finland could be classified as a coordinated market economy (Hall and Soskice 2001).

The Finnish trade union structure is rather concentrated. There are three main confederations. The Central Organization of Finnish Trade Unions (SAK 2022) represents more than one million employees who are members of SAK's 21 industrial labour unions. Members are from industry, the public sector, transport and private services. The Finnish Confederation of Professionals (STTK 2022) is an umbrella organization for 17 affiliated unions with 0.6 million members, mainly salaried employees in the public sector, private industry, and the private service sector. Since its bases are in the service sector, STTK is female-dominated: about 75% of its members are women. STTK's membership consists of nurses, technical engineers, police officers, secretaries, and bank employees. Finally, the Confederation of Unions for Professional and Managerial Staff in Finland (Akava 2022) has 35 affiliated unions with over half a million members. Akava's members are generally highly educated, and include employees, entrepreneurs and self-employed professionals in either the public or private sector, generally in positions such as experts, teachers or managers. Comparatively speaking, union density in Finland is very high, although it has fallen rapidly, from close to 90 % of the labour force in the late 1980s to 65% in in the late 2010s. If retired members are removed from the statistics, in 2019 the union density was 68%, with the share being four percentage points higher for women than for men (Keskinen 2019; Launonen 2021). Despite the decline, union density in Finland is the third highest in the EU (after Denmark and Sweden).

The employers' interest groups are also concentrated in just a few organisations. The Confederation of Finnish Industries (EK) is a conglomeration of heavy industry and private sector service employers. In the public sector, there are two separate employers' organizations: the Local Government Employers (KT) and the State Employer's Office (VTML). Furthermore, the Finnish Lutheran Church has its own employer organization, the Commission for Church Employers (KiT).

One special feature of the Finnish system of labour market negotiations has been concentrated income policy negotiations, with 'social pacts' brokered by the central government. Employer and employee organizations bargained over wages, while the government facilitated agreements by using sticks and carrots. The sticks were mainly increased taxes if wage increases were too excessive. The carrots were promises of higher employment-related benefits such as sick and family leave benefits, better pension provisions and other social policy-related reforms. The social partners have actively participated in reform of the Finnish welfare state (Pesonen and Riihinen 2002: 91-95). Thus, social corporatism has been very strong, and the social partners not only played an important role in establishing a well-functioning collective bargaining system, but also in the construction of the comprehensive social policy model. For example, all major reforms of employment-related pensions have been the result of negotiations and agreements between the social partners (see Kangas, Lundberg and Ploug 2010).

Another central feature of the labour market negotiation system has been *yleissitovuus*, or the principle of 'generally binding agreements' – that is, collective agreements which are generally applicable throughout the labour market. This means that every employer must follow the stipulations which the generally applicable collective agreement sets out for the sector in question (Ministry of Social Affairs and Health 2022a). This has been possible because labour market agreements have been negotiated at the sectoral or at higher levels. Collective bargaining coverage has traditionally been high, and is still over 90%. The share of company-level agreements is still very low.

However, the situation is gradually changing, and social corporatism is gradually withering away as employers try to do away with generally binding agreements. During the most recent decade, the employers' federations have insisted on branch- or local-level bargaining instead of the centralized, top-level wage agreements that have been in use since the mid-1960s. The shift in emphasis mirrors the ever stronger position of employers vis-à-vis employees. The shift in the balance of power is linked to the fact that whereas employers are acting in increasingly global markets and benefiting from that, trade unions are more bound by national contexts. Furthermore, there is a steady decline in the share of unionised employees, which mirrors the structural transformation of employment from traditional manufacturing with permanent and full-time jobs and high union density towards services with part-time and atypical work contracts and much lower degrees of unionisation.

However, it is important to emphasise that the trajectories described above do not mean the end of social dialogue in Finland, even though its forms and contents may change. Nowadays, the social dialogue covers topics such as the employment relationship, working conditions and working hours. Employee and employer federations prefer labour market agreements to statutory solutions on such labour market issues as minimum wages or teleworking. Regarding the latter, Finland

addresses teleworking issues in laws on safety and health, laws on working time and general labour laws rather than specific laws on teleworking. In practice, telework is mainly regulated through sectoral collective bargaining or through sectoral and company-level agreements (Eurofound 2022: 46).

A comparison across EU Member States (Lafuente Hernández et al. 2019) shows that access to democracy at work is high in the Nordic member countries (Finland, Sweden and Denmark). However, as we have seen above, there seems to be much room for improvement regarding digitalisation in general, or access to information on digital changes in particular. Being the leading country on the EPI index does not help much.

In 2021, the central trade union confederations SAK, STTK, Akava and the employer confederations published a joint memorandum of understating on social dialogue on digitalisation (SAK et al. 2021). According to the memorandum, there is a need for a dialogue between management and personnel and also among the personnel. Dialogue in workplaces and industries is the best-suited method, in the Finnish circumstances, to implement the joint European digitalisation framework agreed upon between the European employers and employees. As was also commented on in the interviews: '*In Finland, we prefer social dialogue rather than legislation that is too crude and clumsy a method. The question is the same as in discussion on minimum wages. There are countries that demand that the minimum wages level be defined in legislation. In Finland, as well as in the other Nordic countries, we think that the best way is social dialogue and collective agreements that are more flexible and take better into consideration national, local and sectoral circumstances and special needs'* (INT 12).

Section 4.2   Trade unions' position on digitalisation at the national level

Trade unions and employer federations emphasise that digitalisation processes in working life must be steered by a culture of trust. In contrast to the doomsday prophesies of the end of work, trade unions also see that digitalisation and AI will produce significant improvements in productivity, employment, delivery of public services and work processes at workplaces. Positive developments can be hastened by policy measures, public funding and collaboration. The goal is a high-quality working life, characterised by employee wellbeing and high labour productivity (Digitalising Finland 2019).

In their common programme for digitalisation, the Finnish trade union confederations specify four major points: a) ensuring skills and competence development; b) support for workplaces in the introduction of new technologies and new ways of doing things; c) coherent and fair rules of play for a harmonized operating environment; and d) working together towards better solutions.
Ensuring skills and competence development is one major objective of the programme. In order to respond to changes in the content of jobs, and to meet the demands which workers face in new

occupations, there is a growing need to acquire the ability to combine technology skills and interaction skills. Achieving these goals is a task for the entire education and training system, from basic education to workplace learning and training.

Formal education is a necessary but not a sufficient condition for meeting the skill demands of the digital society. The question is how to ensure that employees who have completed their formal education are properly equipped for changes in digital working life. Lifelong learning is seen as a solution, on one hand, to help enterprises to cope and, on the other hand, to help individuals to strengthen the skills they need to successfully engage with the labour market in a rapidly changing society. At the individual level, lifelong learning means engagement in different forms of skill and competency development over the entire lifecycle (OECD 2020).

Support for workplaces in the introduction of new technologies and new ways of doing things is a further operational objective. Labour unions see that future success requires investments in research and innovation to facilitate and speed up economic growth, employment, productivity and skills formation. In their view, increases in productivity will only take place if the implementation of new technologies in the production process is supported by training and by stronger collaboration between different actors (for example, employers, employee organisations, educational institutions and lifelong learning providers). Since the most important changes in the utilisation of technology will take place in workplaces, labour market institutions must be at the forefront of development and provide policy tools to support the change.

Ensuring coherent and fair rules of play for a harmonized operating environment constitutes yet another programme objective. Mutual trust and sufficient levels of employment and social security are central preconditions for a successful digital transition in society. There also is a growing need for definitive rules on how to gain access to data, and governing who has the right to access individual data.

Finally, the unions' digitalization programme also entails working together towards better solutions. One central hallmark of the Finnish high-trust society is collaboration of social partners on issues relating to working life and the social protection of employees. This collaborative principle is still valid. Finland should aim for digital interfaces which enable collaboration between various public and private actors (Digitalising Finland 2019).

Section 4.3 Impact of digitalisation on social dialogue in the electricity production and distribution sector

Employees in the electricity sector belong to a number of different trade unions. The Finnish Electrical Workers' Union [*Sähköliitto*] is the biggest trade union solely representing the interests of electrical workers. The union was founded in 1955, when it split from the Metal Workers' Union. *Sähköliitto* is a member of the Central Organisation of Finnish Trade Unions [Suomen ammattiliittojen keskusjärjestö, SAK] and has about 35,000 members. Electrical workers employed by municipalities or other public bodies may be represented by JHL, representing all professionals working in municipalities, for the Finnish state and in private welfare services, and the students in these sectors. Therefore, the Electrical Workers´ Union and representatives of JHL both conduct negotiations with employer organisations.

Previously, collective bargaining was conducted in a more centralised way. Gradually, bargaining processes have become more decentralised, and within the Electrical Workers´ Union there are various smaller branches that conduct their own negotiations. The Electrical Workers´ Union represents those sectors at the bargaining table. The main negotiation partners are the Service Sector Employers (PALTA), the Electrotechnical Employers' Union (STTA) and the Energy Industry. For the time being, the bargaining process seems to be settled and no major changes are taking place.

Digitalisation is not an issue covered by the Electrical Workers´ Union agreements. The word is not used in the texts of the collective agreement. Neither is telework mentioned at all. However, the general agreements on working hours, wages, various types of compensation, development of skills and employer-provided education, workplace health and good conduct indirectly cover digitalisation and its impacts.

The joint memorandum of agreement on digitalisation drafted by the social partners (see Section 2.2) also covers the Electrical Workers' Union (via JHL). Thus, what the general agreement says on approaches and priorities also applies to the Electrical Workers' Union. The main priority is that discussion should be based on social dialogue at the central, branch and enterprise levels.

All modern societies are heavily dependent on electricity. The future is electric and new ways of producing electricity are rapidly developing. The ongoing Russian war against Ukraine has strengthened the 'green transformation' and the wish to halt fossil-based electricity production. New applications of solar and wind energy are intensifying the transition towards green energy. One important potential benefit of digitalisation is its ability to break down boundaries between energy sectors, enabling integration and cooperation of various actors and systems. For example, it is now easy to load the extra electricity produced by customers' solar panels onto the main grid, or sell the surplus electricity to other users.

Section 4.4   Impact of digitalisation on social dialogue in the Public administrations sector

The public sector employees are unionised in various trade unions that, in turn, are linked to the three central confederations of trade unions. In the SAK, public administration employees are represented by the JHL, with its 170,000 members. In the lower white-collar STTK, public administration employees are represented by Tehy (with 160,000 members), Super (60,000 members), Jyty (50,000 members), Pro (120,000 members) and Kela employees (4,500 members). Finally, within the upper white-collar Akava, public administration workers are represented by the Trade Union of Education (122,000 members), Academic Engineers and Architects in Finland TEK (70,000 members) and the Finnish Medical Association (26,000 members).

The trade union Pro (2020) represents the interests of various categories of private and public sector employees: people working in wood processing, banking and insurance, media and ICT and transport, as well as in the chemical, food, textile, building and technology industries. Pro also includes workers in public sector institutions and employees in private sector social service firms. Therefore, Pro carries out negotiations with a number of different employer federations, such as Technology Industry, as well as Palta, representing the public sector (mainly state) employers (Pro 2020). This bargaining, and the collective agreements reached, are at sectoral level. Just like Pro, JHL represents various categories of public sector (state and municipality) employees, such as nurses and practical nurses as well as other persons working in the social, health care and hospital sector. The negotiations are conducted at the sectoral level between JHL and Local Government Employers in Finland or between JHL and Palta (Service Sector Employers) (JHL 2022; Palta 2017).

To conclude, digitalisation is not seen as a threat in the public sector. Union density among public sector employees is rather high. In that sense, digitalisation is not a threat at all. In the interviews conducted, trade union leaders emphasise that thanks to digitalisation, it is far easier for them to be connected with the employees they represent than previously during the 'paper and phone' era.

Section 4.5   Impact of digitalisation on social dialogue in the hospital sector

The main bargaining processes and partners are discussed above in Section 4.1. The aim of the Sote reform (see Section 2.3.10) is to harmonise wages and salaries between welfare counties. The issue has caused disputes between the trade unions and the representatives of the public sector employers.

Salaries in the public social and health care sectors are lagging behind the salary levels in private sector occupations with similar levels of average educational attainment to nurses (Elo 2022). In their 'Sote rescue programme', the labour unions Tehy and Super demanded 3.6% increases in

annual salaries for five consecutive years, in addition to the usual contractual increases. The demands were motivated by salary comparisons and the increased workload due to the Covid-19 pandemic. The employers, representing the public sector, did not accept the demands. To boost their demands, Tehy and Super decided to launch various industrial action measures that took place until the labour unions and employers concluded an agreement in October 2022.

To conclude, the main challenges and opportunities for the trade unions are not related to digitalisation. Digitalisation is a secondary issue. The main sectoral challenges are the shortage of labour in the social and health care sector. Furthermore, the huge Sote reform raises questions that are more topical than digitalisation for the major sectoral labour unions (Tehy, Super, Jhl, Pro).

As regards possibilities for combining digitalisation and trade union activism, digitalisation is seen as improving the connections between the union representatives and their constituencies.

In its commentary on the national digital strategy, Tehy (2022) raises important issues. While some of them are specific to the health care sector, others have a wider social bearing. Clearly, the development of new digital platforms is not enough. Neither is it sufficient for employees in the social and health sector to master all the ICT technologies used in their workplaces. Effective utilisation of digital services requires skills and knowledge for clients too. It is particularly important to note the special needs of those in a vulnerable position (the elderly, immigrants, people with disabilities and other special groups), who may not have sufficient resources to acquire digital skills or equipment.

Section 4.6   Overall sectoral cross-cutting conclusions

Digitalisation will change the methods and the content of employment in all sectors. There is virtually no sector that is not being impacted by digitalisation. As discussed above, the three sectors focused on in this report do however use digital tools differently and for different purposes. Consequently, attitudes to digitalisation vary significantly between the sectors.

Although all sectors of economic activity are impacted by digitalisation and will be much more so in the future than now, collective agreements are silent on this issue. The reason is not that the social partners involved in the bargaining processes are unaware of the huge importance of digitalisation. Rather, there seems to be tacit mutual trust that digitalisation, its positive and negative sides, can be properly handled in dialogue between the social partners.

SECTION 5. RECOMMENDATIONS TO NATIONAL AND EU STAKEHOLDERS

Section 5.1 Recommendations to national stakeholders

In present-day society, digital literacy is an essential precondition for full societal participation, in the sense that people must have sufficient capacities to participate in working life and more generally to cope in society. Digital literacy includes two central aspects. The first aspect is the capacity to read and critically evaluate what one has read. This aspect pertains to all information available in digitalised form, through all possible digital channels. Regarding acquisition and implementation of new digital technologies and software, the usual processes by which this takes place seem to be organised in a manner which is excessively top-down in nature. Usually, an employer simply declares that a new digital system will be taken into use. Employees are forced to adapt to these changes.

- Digital literacy must be included in curricula at all levels of education.

- Life-long learning in general, and employer-provided training in particular, must better take into consideration individual needs.

- Special measures should be planned and taken to enhance participation of those who have inadequate digital skills. As a rule, those who have digital skills currently participate much more in further education, whereas those lacking skills participate much less.

- The process of acquisition of new technologies is too much of a top-down process. Such processes should include more genuine dialogue.

The second major aspect to successful social participation relates to skills in digital writing and in telling stories in digital forums. Such skills become increasingly relevant when services traditionally provided face-to-face (such as health care, mental health care services, etc.) are digitalised. This issue is most important in the public services and as well as in health care.

Regarding public services, the combining of databases will help clients with multiple intertwined problems. Clients no longer need to provide a multitude of documents, which will simplify and speed up decision-making processes. Regarding social and health care services, digitalisation facilitates more personalized, preventive, and predictive healthcare services. For all these hopes to be materialised, there is a need to:

- Improve the sectoral coordination between different actors.

- Better coordinate digital platforms between welfare counties to make data exchange and information flows more seamless.

One specific group which tends to lack linguistic and digital skills are immigrants in general, and refugees in particular. Immigrants' employment rates tend to be 20 percentage points lower than among the native population in Finland. The same applies to people with disabilities, with employment rates in this group likely to be even further below that of the general population. In order to improve the situation, new digital technologies (for example, digital interpretation services, remote work, mobile work, and other digital employment arrangements) should be used to promote the inclusion of disadvantaged persons in the labour force.

Section 5.2 Recommendations to European stakeholders

The recommendations to European stakeholders are more or less the same as those geared to the Finnish audience. In the whole EU area, those with higher human capital tend to participate more in continuous education than those with lower human capital stocks. In the EU, there is a 28% gap in the participation rates in lifelong learning between those with tertiary education and those with lower educational attainments (OECD 2021). Thus, those with higher skill levels are the most prone to be involved in lifelong learning, and thus accumulate advantages. Regarding Finland, the task for European-level policymakers and national labour market partners is to try to find effective policies to also enrol those with low digital skills in life-long learning.

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Annex 1. List of focus groups

ID	Gender	Trade union affiliation	Sector	Occupation
FG1	F	Trade Union for the Public and Welfare Sectors (JHL)	TU public sector employees; 9 September 2022; Teams; 90 minutes.	Researcher
FG1	F	JHL	TU public sector employees; 9 September 2022; Teams; 90 minutes.	Officer
FG1	M	JHL	TU public sector employees; 9 September 2022; Teams; 90 minutes.	Bargaining officer
FG1	F	(JHL	TU public sector employees; 9 September 2022; Teams; 90 minutes.	Collective agreement coordinator
FG2	F	Kela employees	TU public sector employees; 9 September 2022; Teams; 80 minutes	Senior TU officer
FG2	F	Kela employees	TU public sector employees; 9 September 2022; Teams; 80 minutes.	Senior TU officer
FG3	F	The Union of Health and Social Care Professionals in Finland (TEHY)	TU Nurse; 22 September 2022; Teams; 75 minutes.	Head of the section
FG3	F	(TEHY)	TU Nurse; 22 September 2022; Teams; 75 minutes	Head of negotiations
FG3	F	Trade Union Pro	TU public employees; 21 September 2022; Teams; 65 minutes	Head of the section

Annex 2. List of interviews

ID	Gender	Institution	Sector	Occupational group	Position	Date	Method
INT1	F	(TEHY) The Union of Health and Social Care Professionals in Finland	Health and Hospital	TU Nurse	Nurse in health care centre	30 September 2022	Face-to-face
INT2	F	TEHY	Health and Hospital	TU Nurse	Senior nurse	17 December 2022	Zoom
INT3	M	TEHY	Health and Hospital	TU Nurse	Nurse in hospital	21 September 2022	Teams
INT4		TEHY	Health and Hospital	TU NUrse	Nurse in hospital	21 September 2022	Teams
INT5	F	TEHY	Health and Hospital	TU Nurse	Nurse in surgery	17 December 2022	Zoom
INT6	F	TEHY	Health and Hospital	TU Nurse	Nurse in emergency	17 December 2022	Zoom
INT6	F	Union of Practical Nurses SuPer	Health and Hospital	TU Practical nurse	Nurse in hospital bed ward	17 December 2022	Zoom
INT7	F	Trade Union Pro	Public administration	TU public employees	Senior officer	8 September 2022	Face-to-face
INT8	M	Pro	Public administration	TU public employees	Data manager	8 September 2022	Face-to-face
INT9	FF	Pro	Public administration	TU public employees	Senior officer	21 September 2022	Face-to-face
INT10	F	Kela employees	Public administration	TU public employees	Senior officer	21 September 2022	Face-to-face
INT11	F	Pro	Public administration	Public administration	Expert on services	21 September 2022	Face-to-face
INT12	M	Central Organisation of Finnish Trade Unions	Central organisation of TUs; 22 August 2022; face-to-face; 75 minutes.	Development officer	Male	Central Organisation of Finnish Trade Unions	Central organisation of TUs; 22 August 2022; face-to-face; 75 minutes.

Annex 3. Appendix tables

All the appendix tables are based on the researcher's own calculations from the Finnish DigiQual survey data.

Appendix Table 1. Digitalisation and organisation of work in the electricity sector; distribution of responses to questions on work tasks, content of work and work satisfaction (%).

Items on the content of work	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
Digitalisation has improved…					
- Job quality	14	19	23	36	8
- Productivity	16	13	21	36	15
- Quality of service to users	16	8	48	23	5
- Cooperation with colleagues	15	13	22	37	13
- Autonomy to schedule work tasks	15	17	26	31	10
- Coordination of tasks with colleagues	13	12	30	35	11
- Overview of implementing my tasks	18	11	33	32	7
- Supervisor's assessment of my job	13	17	36	23	11
- Colleagues' assessment of my job	15	14	44	21	6
- Possibilities to focus on significant aspects in my job	21	18	17	33	12
- External users' assessment of my job	15	15	38	21	11
- Working conditions	17	14	32	34	4
- Wages	23	19	34	20	4
Digitalisation has…					
- Decreased time used for routines	20	24	20	25	12
- Increased pace / intensity in work	11	14	25	24	26
- Increased time to control job tasks	10	23	31	19	18
I am satisfied…					
- My job is better now	18	13	46	20	2
- My job is more interesting and attractive now	16	13	32	32	8

Source: Q22_8, Q22_9, Q23_3, Q23_5, Q23_6, Q24_1, Q24_2, Q24_3, Q24_4, Q24_5, Q24_6, Q24_7, Q24_8.

Appendix Table 2. Digitalisation and working time in the electricity sector, distribution of responses to questions on working hours, overtime work and time used for commuting (%).

Items on working hours	Digitalisation has…				
	Significantly decreased	Somewhat decreased	Neither nor	Somewhat increased	Significantly increased
- working hours	0	5	74	17	5
- paid overtime	1	3	87	8	1
- unpaid overtime	2	2	79	14	3
- unsocial working time	0	6	76	16	2
- breaks and time for rest	2	23	69	7	0
- commuting time to work	5	7	85	3	0
- commuting time to customers	5	6	82	7	1

Source: Q25_1, Q25_2, Q25_3, Q25_4, Q25_5, Q25_6, Q25_7.

Appendix Table 3. Digitalisation and experiences of monitoring, harassment and verbal violence in the electricity sector (%).

Items					
Digitalisation has increased	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- monitoring of employees	11	5	36	31	18
- harassment from colleagues	22	14	50	8	5
- verbal / physical violence from clients	24	12	54	7	4
- verbal / physical violence from colleagues	19	14	54	7	6

Source: Q35_7, Q35_8, Q35_9, Q35_10.

Appendix Table 4. Opinions on employer-provided education and training in the electricity sector (%).

Items					
Employer-provided training	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- sufficiently takes into consideration my needs	22	28	35	13	1
- strengthened my skills and career prospects	6	7	35	45	7
- opens up possibilities in my current workplace	19	15	47	18	1
- opens up possibilities outside my current workplace	13	9	40	33	5
- will not change anything for me	11	14	42	19	14
- reduces my job security in the future	18	20	46	10	6

Source: Q30_2, Q30_3, Q30_4, Q30_5, Q30_6, Q37_28.

Appendix Table 5. Digitalisation and work-family-life balance in the electricity sector (%).

Items:					
Digitalisation has…	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- improved the balance between personal/family time and work time	18	16	36	22	6
- increased personal and family time	18	18	54	14	3
- not affected time outside work	12	15	35	15	24
- increased work time at the expense of family time	16	15	30	30	9
- meant that teleworking at home is difficult to combine with my household responsibilities	8	7	69	12	5
- meant that, when teleworking at home, it is difficult to differentiate between working time and personal time	8	3	59	17	13

Source: Q22_10, Q23_2, Q26_1, Q26_2, Q26_3, Q26_4, Q26_5.

Appendix Table 6. Digitalisation and organisation of work in public services, distribution of responses to questions on work tasks, content of work and work satisfaction (%).

Items on the content of work	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
Digitalisation has improved…					
- job quality	4	11	18	34	34
- productivity	6	9	16	29	40
- quality of service	3	12	12	39	34
- cooperation with colleagues	6	13	23	35	23
- autonomy to schedule work tasks	8	11	20	31	32
- coordination of tasks with colleagues	13	12	33	32	10
- overview of implementing my tasks	8	12	34	28	18
- supervisor's assessment of my job	9	10	32	30	20
- colleagues' assessment of my job	9	12	43	24	11
- possibilities to focus on significant aspects in my job	12	17	15	26	30
- users' assessment of my job	12	12	47	18	11
- working conditions	5	12	22	34	28
- wages in my sector	13	17	43	16	11
Digitalisation has…					
- decreased time used for routines	11	18	20	26	25
- increased pace / intensity in work	4	8	16	32	40
I am satisfied…					
- my job is better now	7	15	30	30	18
- my job is more interesting and attractive now	6	13	19	31	31

Source: Q22_8, Q22_9, Q23_3, Q23_5, Q23_6, Q24_1, Q24_2, Q24_3, Q24_4, Q24_5, Q24_6, Q24_7, Q24_8.

Appendix Table 7. Digitalisation and working time in the public administration, distribution of responses to questions on working hours, overtime work and time used to commute (%).

Items on working hours	Digitalisation has…				
	Significantly decreased	Somewhat decreased	Neither nor	Somewhat increased	Significantly increased
- working hours	1	2	83	11	4
- paid overtime	2	3	85	9	2
- unpaid overtime	2	1	83	11	4
- unsocial working time	2	1	78	15	4
- breaks and time for rest	7	26	60	7	1
- commuting time to work	37	11	49	2	1
- commuting time to customers	7	4	87	1	1

Source: Q25_1, Q25_2, Q25_3, Q25_4, Q25_5, Q25_6, Q25_7.

Appendix Table 8. Digitalisation and experiences of monitoring, harassment and verbal violence in the public service sector (%).

Items	
Digitalisation has increased	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- monitoring of employees	3	6	34	30	27
- harassment from colleagues	40	13	37	8	2
- verbal / physical violence from clients	35	13	37	8	2
- verbal / physical violence from colleagues	42	11	38	7	2

Source: Q35_7, Q35_8, Q35_9, Q35_10.

Appendix Table 9. Opinions on employer-provided education and training on digitalisation in the public service sector (%).

Items:					
Employer-provided training	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- sufficiently takes into consideration my needs	15	30	27	22	7
- strengthened my skills and career prospects	2	6	16	48	28
- opens up possibilities in my current workplace	16	16	33	25	10
- opens up possibilities outside my current workplace	10	14	35	30	11
- will not change anything for me	8	15	34	20	24
- reduces my job security in future	30	20	40	7	2

Source: Q30_2, Q30_3, Q30_4, Q30_5, Q30_6, Q37_28.

Appendix Table 10. Digitalisation and work-family-life balance in the public service sector (%).

Items:					
Digitalisation has…	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- improved the balance between personal/family time and work time	5	9	20	23	44
- increased personal and family time	9	9	34	20	28
- not affected time outside work	15	20	22	18	26
- increased work time at the expense of family time	35	13	27	20	5
- meant that teleworking at home is difficult to combine with my household responsibilities	29	14	39	14	4
- meant that, when teleworking at home, it is difficult to differentiate between working time and personal time	33	13	27	19	8

Source: Q22_10, Q26_1, Q26_2, Q26_3, Q26_4, Q26_5.

Appendix Table 11. Digitalisation and organisation of work in health care, distribution of responses to questions on work tasks, content of work and work satisfaction (%).

Items on the content of work	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
Digitalisation has improved…					
- job quality	12	17	26	30	15
- productivity	17	14	32	24	13
- quality of service	26	21	25	18	9
- cooperation with colleagues	14	19	30	26	12
- autonomy to schedule work tasks	18	18	28	23	12
- coordination of tasks with colleagues	14	16	30	29	11
- overview of implementing my tasks	17	16	35	21	10
- supervisor's assessment of my job	16	14	34	24	12
- colleagues' assessment of my job	17	16	41	18	9
- possibilities to focus on significant aspects in my job	27	24	19	17	12
- users' assessment of my job	25	15	42	12	6
- working conditions	13	20	27	26	14
- wages in my sector	24	18	37	13	7
Digitalisation has…					
- decreased time used for routines	23	24	23	18	12
- increased pace / intensity in work	9	12	25	25	28
I am satisfied…					
- my job is better now	17	19	40	17	7
- my job is more interesting now	16	19	29	24	13

Source: Q22_8, Q22_9, Q23_3, Q23_5, Q23_6, Q24_1, Q24_2, Q24_3, Q24_4, Q24_5, Q24_6, Q24_7, Q24_8.

Appendix Table 12. Digitalisation and working time in health care services and in the hospital, distribution of responses to questions on working hours, overtime work and time used to commute (%).

Items on working hours	Digitalisation has…				
	Significantly decreased	Somewhat decreased	Neither nor	Somewhat increased	Significantly increased
- working hours	1	3	77	15	5
- paid overtime	2	2	81	12	3
- unpaid overtime	2	1	87	8	2
- unsocial working time	1	2	87	8	3
- breaks and time for rest	7	19	68	6	1
- commuting time to work	4	3	89	6	1
- commuting time to customers	2	3	92	3	1

Source: Q25_1, Q25_2, Q25_3, Q25_4, Q25_5, Q25_6, Q25_7.

Appendix Table 13. Digitalisation and experiences of monitoring, harassment and verbal violence (%) in the health care sector.

Items					
Digitalisation has increased	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- monitoring of employees	5	7	40	26	22
- harassment from colleagues	26	10	49	10	5
- verbal / physical violence from clients	27	89	52	11	6
- verbal / physical violence from colleagues	27	7	50	12	3

Source: Q35_7, Q35_8, Q35_9, Q35_10.

Appendix Table 14. Opinions on employer-provided education and training on digitalisation in the health care sector (%).

Items					
Employer-provided training	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- sufficiently takes into consideration my needs	19	26	37	16	2
- strengthened my skills and career prospects	7	12	28	38	16
- opens up possibilities in my current workplace	25	15	40	15	5
- opens up possibilities outside my current workplace	14	13	40	24	9
- will not change anything for me	5	12	38	19	26
- reduces my job security in the future	21	17	51	8	3

Source: Q30_2, Q30_3, Q30_4, Q30_5, Q30_6, Q37_28.

Appendix Table 15. Digitalisation and work-family-life balance in the health care sector (%)

Items					
Digitalisation has…	Strongly disagree	Somewhat disagree	Neither nor	Somewhat agree	Strongly agree
- improved the balance between personal/family time and work time	17	15	41	17	10
- increased personal and family time	21	11	57	6	4
- not affected time outside work	6	9	27	17	41
- increased work time at the expense of family time	26	11	42	16	5
- meant that teleworking at home is difficult to combine with my household responsibilities	13	5	70	7	5
- meant that, when teleworking at home, it is difficult to differentiate between working time and personal time	12	5	66	9	8

Source: Q22_10, Q23_2, Q26_1, Q26_2, Q26_3, Q26_4, Q26_5.