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**The slow but inexorable
digitalisation of work in
Hungary's public services
against a backdrop of
weak social dialogue**



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Executive summary

Introduction

The purpose of this Research paper is 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. The Research paper also explores 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 Hungary in three sectors: electricity, public administration and healthcare. Major trends in digitalisation and sectoral level digitalisation patterns were studied and analysed through desk research. This was complemented through empirical research, including the harmonised DIGIQU@LPUB web survey (DGQS), 31 interviews with sectoral trade union representatives and three focus group discussions. Based on the outcomes of the country analysis, policy recommendations have been formulated for Hungarian and European stakeholders and policymakers.

Background information

According to the European Commission's latest Digital Economy and Society Index (DESI) report (European Commission 2022a), Hungary is lagging behind in all dimensions of digitalisation, including digital development, human capital, digital public services and women's inclusion in digital jobs, careers and entrepreneurship (as assessed in the Women in Digital Scoreboard, European Commission 2022b).

The Hungarian government has recently adopted the National Digitalisation Strategy for 2022-2030 (Ministry of Innovation and Technology, Ministry of Interior 2020). The programme considers digital economy, education and digital public services the key condition of competitiveness and modernisation. Besides this, digitalisation – with a relatively high allocation – is one of the top priorities of the Hungarian Recovery and Resilience Plan (Government of Hungary 2021). Patterns and history of digitalisation show significant differences at sectoral level and within sectors, namely at institutional or geographical level.

Digitalisation started 10-15 years ago in the energy sector, but the process has accelerated in the last few years. In the 2000s', the main aim of digital solutions was to increase the efficiency of operation and services. In the last 3-5 years, enhancing the flow of information, data collection and analysis have become the most important goals of digitalisation. In recent years, most digital developments aimed at creating user-friendly, informative digital surroundings and increasing the efficiency of services also saves costs by reducing the number of phone calls and e-mails to the customer services department.

Although most of the relevant public services are available online – and the most important ones have their own structured online forms, online applications or applets – Hungary was ranked relatively low in the latest DESI report in this field. All other services are available via the e-paper online form service, which allows users to submit authenticated electronic documents. The digitalisation of the public administration in Hungary is ongoing and is predominantly supported by EU funds, however the implementation of such programmes has been uneven in certain levels of the public administration sector. While municipalities mainly have financial issues that prevent them from investing in digital developments above the mandatory used web-based programmes (e.g. tax registration and filing), there has been significant developments in central administration offices.

Digitalisation has been spreading slowly but surely in all areas of healthcare. One of the most important digital developments in recent years was the introduction of the Electronic Health Service Space (EESZT) in 2017, containing all patient health data. The use of digital networks has also become widespread, but is less common at smaller institutions. Another challenge is that even state-run institutions use different IT developments, whose compliance with legislation is often questionable. Experiences with digital devices vary widely. The most common devices are installed computers and smartphones. Healthcare workers use computers and smartphones most commonly in their daily work, although in smaller rural hospitals manual documentation of patients is still common. In addition, larger hospitals already have more sophisticated digital tools (e.g. smart beds), which are predominantly supported by EU funds.

Key findings

In Hungary, digitalisation is not on the top of the agenda in social partners' discussions, nor is there a national or sectoral forum where the topic of digitalisation could be tripartite discussed. Additionally, trade unions are not involved in strategic planning or programming on digitalisation, thereby missing concrete opportunities to influence digitalisation developments or contribute to the debates by sharing their experiences and views of the effects of digitalisation on workers. The gradual weakening of social dialogue patterns and trade unions' rights in Hungary further weakens this opportunity in general.

As a result of the digital evolution, many digital solutions were already present in the three examined sectors (e.g. smart meters and online applications in the electricity sector; user-friendly applications and online filing in the public administration sector; the electronic health system record in the health sector since 2018). However, the Covid-19 pandemic has given a new impetus for digitalisation in many sectors, mainly with the aim of protecting employees and ensuring quality and safe services at the same time. In addition, the pandemic placed extraordinary pressure on the health care system in Hungary. All these changes require continuous adaptation from workers, which could be especially challenging when they or their representatives were not

involved in the preparation of the digital development, and are not provided with proper information during the introduction of the changes.

Many companies and organisations introduced **teleworking** in jobs where the personal presence of the employee was not strictly necessary. For example, teleworking was not an option for electricity technicians or health care providers, but customer service employees could telework in large numbers. The public sector, in this respect, was not unique as teleworking in national ministries – except in some extraordinary cases – was not allowed, while municipalities made it a choice for their employees. Even with those employers where teleworking was an option, it was not discussed with social partners' organisations (with the exception of the metropolitan municipality of Budapest). Teleworking affects many dimensions of job quality, including **work organisation** itself, but also **working time**. Several employees reported – both in the interviews and the surveys - that teleworking led to increased working hours, including during unsocial hours. In some cases, the availability of workers outside of working time was an issue too. On a positive note, most of the employees concerned reported a decrease in commuting time. Teleworking also had a high impact on **work-life balance** (unclear boundaries between work and private life; family conflicts, etc.). Workers often checked their e-mails and even answered them after working time, mostly by their own choice. Arranging private issues during working time, household tasks and childcare responsibilities (especially in case of women) often led to work outside of official working times, even during unsocial hours (including nights). Many workers are not familiar with the rules of occupational health and safety, which can cause **physical and mental health risks** (for instance, eye and muscular overstrain including back and neck pain). The fact that health and safety rules on working in front of the screen are outdated and contain rules almost exclusively on physical health make the situation even more difficult.

Digitalisation, however, has obviously reduced **physical risks** in certain cases, while the effect of digitalisation on **mental well-being** and stress is controversial. As a negative, it has led to a high level of control over employees (e.g. in electricity sector, where all actions and movement of technicians and call centre operators are followed), but in the health sector it has reduced some of the psychological pressure of high levels of medical responsibility; it has minimised the potential for error, e.g. in the administration of medicine, or the safer diagnoses or prescriptions. Adjustment to quick changes, however, can be challenging for some employees; it can often lead to frustration and thus increase mental stress at work.

As a result of digitalisation, more and more **training** is held online. While most employees acknowledged the flexibility of online training, some felt the lack of personal interactions and sense of community. Workers with lower levels of ICT skills – especially among the older generation who did not grow up in a digitalised world – often face challenges during online learning.

Digitalisation has not affected **workers' rights** perse, however it has made it easier for trade unions to engage with their members. They can operate websites, be present on social media, organise online video conferences, reach people apart from their members with newsletters and also organised online voting during the Covid-19 pandemic.

Conclusion and policy pointers

Digitalisation has both important positive and negative effects on job quality and consequently on workers' well-being. Governments, therefore, in close co-operation with social partners, should strive to provide an environment where – ensuring equal opportunities for all employees – the positive impacts of digitalisation can be maximised while risks and negative outcomes are handled effectively.

At a national level, the most important message is that social partners' organisations should be involved in the development of digitalisation strategies. This also pertains to trade unions' participation in the monitoring committees to ensure a real opportunity to represent workers' interest in connection with digitalisation. Recommendations highlight that digitalisation should be looked at as an opportunity that can be best exploited if the workforce is as highly skilled as possible. Proper funding is essential to get the most out of digitalisation, with special attention to the underfinanced health sector. The Hungarian government is called to strengthen social dialogue patterns, especially in the public administration sector. The establishment of proper legislation and enhancing labour inspection to increase the mental and psychological protection of workers against the negative impact of digitalisation is paramount. Finally, special attention should be taken on the development of older workers' digital skills to avoid inequalities and further gaps currently present in the digital world.

As regards to recommendations to European stakeholders, the impact of digitalisation on the labour market should be discussed at community level. Besides, common activities should be carried out, including the development of online courses on new digital tools, processes, and the enhanced cooperation in the field of digitalisation-related cyber defence. The availability of European resources to facilitate digital development is crucial, while the involvement of the social partners at all levels should be a key condition for EU funding.

1. Introduction

This Research paper presents the results of the national study carried out as part of the European Commission-funded 'DIGIQU@LPUB' project ⁽¹⁾, which studies the impact of digitalisation on job quality and social dialogue in the public services. It covers eight European Union (EU) countries: Denmark, Finland, France, Germany, Hungary, Italy, Poland and Spain. The study is led by the European Social Observatory (OSE) and is funded by the European Commission's budget line 'Improving Expertise in the field of Industrial Relations'.

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 production and supply, and the hospital and health sector. The project also aims to raise 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 from 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 policy recommendations, to both European and national trade unions and decision-makers, on suitable ways to address the digital transformation of work.

This Research paper analyses the impact of digitalisation on job quality and social dialogue in Hungary. In addition to desk research, three sources of original data are used to address the research question: interviews conducted with trade unionists and workers; focus groups (a small number of carefully selected people who discuss a given topic) among field workers; and data from the original DIGIQU@LPUB (DGQS) web survey conducted by the European Social Observatory. Due to the uneven distribution of the sample among the different sectors, methodological limitations should be taken into account when interpreting the quantitative results.

1. A more elaborate project description, in-depth country case studies and analytical reports can be found on the project website: <https://www.ose.be/digiqu@lpub/>

The DIGIQU@LPUB web survey (hereafter referred to as 'DGQS') was answered by 286 persons in total for Hungary (92 in the electricity sector, 48 in the health sector and 146 in the public administration sector). The **outcomes of the DGQS** are the following in the three sectors.

The DGQS was followed by **interviews** (30 in total – 10 in each sector) and by three sectoral **focus group discussions** with ten participants per sector, so 30 focus group participants in total.

In the **electricity sector**, the ten interviewees were contacted through the president of the trade union association. The interviews were conducted by telephone, based on the questions sent in advance. Except for one person, all of them are independent trade union leaders. The organisation of the focus group discussion was more challenging, but it was finally carried out successfully with the participation of 10 employees (all of them trade union members). The composition of the interviewees, which was relatively representative for main groups of occupations, gender and educational background, was as follows. 70% of the interviewees were men and 30% women. Half of the interviewees have university or college degrees and mainly work as electrical engineers or engineering technicians (one as an administrator). Workers with secondary level qualifications (both high school and secondary vocational school qualifications) were hired in occupations like electrician technicians and financial administrators. One participant had primary level education and worked as a storekeeper.

In the **public administration sector**, the ten interviewees represented different levels of the public administration system. Four of them work in the central public administration (two of them in ministries and two in central offices); one in the territorial state administration (in a district-level government office); four at municipalities (at local level, in mayors' offices); while one of the participants is a full-time head of a sectoral trade union federation. The focus group discussion was conducted in the municipal office of a city of 20,000 inhabitants in Western Hungary, with ten people working in the office and its institutions.

The organisation of the interviews and the focus group discussion was quite challenging in the **hospital and health sector**. Trade union leaders in this sector are not independent. This means that they perform this function besides their work (with 12-hour daily shifts). The amount of overtime in the sector is extraordinarily high; the average number of working hours is 208 hours per month, but this number could even reach 280 hours. As a consequence of this very high work pressure (and because union leaders have already had several confrontations with the employer), carrying out longer interviews was not a real option. Therefore, the ten interviewees were selected from the participants at a large professional conference.

In order to include the opinion of trade union representatives in the project, the focus group discussion was carried out as a preliminary agenda point of a two-day long delegates' meeting ⁽²⁾. All of them are members of the Independent Health Care Trade Union (Független Egészségügyi Szakszervezet/FESZ) taking into consideration geographical, occupational, educational and age distribution. Based on the composition of trade union members, 90% of the focus group participants were employees of hospitals and clinics (both from Budapest and the countryside) and 10% represented different occupations including nurses, patient transporters, assistants, a medical officer and a hygienist. Managers and staff members were both among the participants. All the participants were men. The focus group discussion took place in a town in Eger (the capital of Heves county).

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).

This Research paper consists of five main parts: an overview of public policies and research on digitalisation in the country (Section 2); the results of the study on the impact of digitalisation on job quality in the three sectors (Section 3); digitalisation and social dialogue (Section 4); cross-cutting conclusions (Section 5); recommendations made by social partners (Section 6).

2. Setting the scene

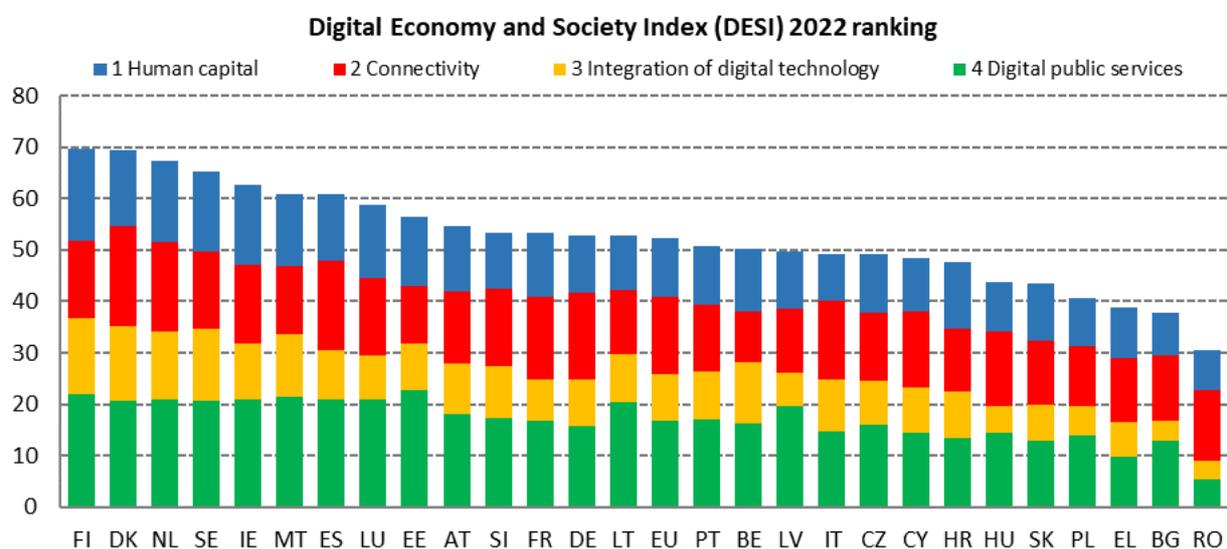
2.1 State of play and national strategies

Although the public sector plays an important role in the Hungarian national economy, which is reflected in its 8% contribution to the GDP, in regional comparison, the productivity of the sector is relatively low. This is also highlighted by the Worldwide Governance Indicators of the World Bank (2022), on which Hungary scored only 72 out of 100 for 'government efficiency'. According to the Global Competitiveness Report 2020 (World Economic Forum 2020), published by the World Economic Forum, Hungary – in 46th place ⁽³⁾ – was among the lowest-ranked countries for public trust in government. The picture shown by the European Commission's latest Digital Economy and Society Index (DESI) report (European Commission 2022) is not more favourable. Hungary was ranked among the lowest performing countries in each dimension examined, including integration of digital development (25th place), human capital measuring the digital and ICT skills of the population (23rd) and digital public services (21st).

-
2. For this period the colleagues were provided days off.
 3. This poor performance was mainly the consequence of the low scores acquired in public education and public health.

This implies that while the wider use of digitalisation has considerably increased the efficiency of tax and social contribution collection, progress in the quality of public services in other fields has remained rather modest. Although digital access to government services and information has been improving, lack of trust in public bodies may discourage the participation of citizens in e-government programmes. Increasing the amount of open data could be a proper direction for improving citizens' trust and boosting economic growth as well as product and service development (European Commission 2017). Hungary, however, withdrew from the Open Government Co-operation in 2017, which aims to increase transparency, citizen participation, civil society dialogue, anti-corruption, accountability and to strengthen technology and innovation.

Figure 1. Digital Economy and Society Index (DESI), 2022 ranking



Source: European Commission 2022a.

The Hungarian government has recently adopted the **National Digitalisation Strategy** for 2022-2030 (Ministry of Innovation and Technology, Ministry of Interior 2020). The document – also considering the DESI evaluation criteria and the 'Smarter Europe' priority of the European Union – sets national targets and activities in the field of digitalisation. The programme considers digital economy, education and digital public services the key condition of competitiveness and modernisation. In line with this, a main element of the programme is to ensure a digitally skilled labour force, and an increased use of digital solutions and enhanced emphasis on the development of ICT skills in vocational, adult and higher education. Unfortunately, employees' organisations were not involved in the preparatory consultations of the document and its activities, nor in the monitoring of the implementation of the strategy (INT 13).

Besides this, one of the top priorities of the **Hungarian Recovery and Resilience Plan** (Government of Hungary 2021) is digitalisation, which also aims at closing the gap with the EU average in this field. To underline the importance of this topic, the document is planned to allocate more than 23% of its total budget to digitalisation.

2.2 State of play at sectoral level

2.2.1 Overview of the three sectors

Despite the strategic importance of the **electricity production and supply sector**, its contribution to the Hungarian GDP is not significant (1.7%). Companies in the electricity sector are mainly public-owned (64%) with a total number of employees of 23,785 (0.75% of the total workforce) and with a significant gender gap (almost two-thirds are male workers). Educational attainment and skill level in the sector is above the national average, as 53% of the employees have a university qualification and only 1% have a primary or lower qualification. The proportion of highly skilled and skilled professionals is also outstanding. A major challenge – in line with the ageing workforce – is to find and keep young workers. The workload has recently increased significantly due to the consequences of the energy crisis leading to longer working hours (all Focus group participants agreed).

The Hungarian **public administration** is a dual system, with a central and a territorial level. While the central level includes ministries, central government agencies, and the government itself, the territorial level of public administration consists of county level government offices, district level government offices and district level customer service offices (the so-called 'government windows'). Alongside the central and regional administrations, there is also a system of self-government, made up of county and local level municipalities and their institutions. It is important to highlight that the Hungarian public administration sector has become more and more centralised since 2010, restructuring the traditional allocation of tasks and responsibilities. In 2021, 111,623 persons (of which 58% women and 42% men) were working in the sector, representing 2.4% of the domestic workforce. White-collar workers were highly overrepresented, with a proportion of above 94%. Sectoral union coverage is estimated at around 17% in local and 5.8% in central government. Strikes in local public administrations in recent years have increased unionisation (INT13).

Life expectancy in Hungary is among the lowest in the EU, while mortality from preventable and treatable diseases is high. Both in absolute terms and as a share of GDP, Hungary spends significantly less on healthcare than the EU average (6.5% of GDP compared to 9.9% on average in the EU). In addition, the increasing shortage of health professionals makes access to medical care more difficult. The situation became even more serious with the Covid-19 pandemic. According to the latest survey from the Hungarian Central Statistical Office, the number of trade

union members in the **health and social services sector** was 45,691 ⁽⁴⁾ (including 8,545 men and 37,146 women), i.e. 17.7% of the total number of employees in the sector.

2.2.2 Patterns and history of digitalisation in the three sectors

Although digitalisation started 10-15 years ago in the **energy sector**, this process has accelerated only in the past few years. In the 2000s', digital solutions were used to collect, store and analyse information within companies focussing on efficiency issues. Managing the flow of information, data collection and analysis (e.g. by creating internal corporate management systems and intranet) have become the most important goals of digitalisation in the past 3-5 years. In recent years, most digital developments aimed at creating user-friendly, informative digital surroundings, including websites and mobile applications, have enhanced the customer experience and increased the efficiency of services. They have also saved costs by reducing the number of phone calls and e-mail s to the customer services department. AI is also increasingly used to handle customers' issues.

In the **electricity production and supply sector** 85% of the respondents to the DGQS use mobile devices (such as laptops, smartphones or tablets) to plan/schedule work tasks (66%), for communication (66%), to measure data and collect information (58%) and to monitor performance (54%). Digital machines are less frequently used (24%). Those who work with such machines use them mainly for measuring data and collecting/organising/retrieving information (31%) or monitoring and controlling parameters of equipment or persons (29%). Some of them (21%) use digital machines to perform repetitive routine tasks or to lift/move/change the position of heavy loads or persons (17%). Information and communication tools are used by almost everybody. Except for one person, all respondents agreed that they use the internet and other networks regularly, including e-mail (sending and receiving e-mails was the most popular answer with 87%). Web-based applications are also used frequently. 60% used these applications to exchange information with a partner's network and 53% for online training.

According to the 2021 DESI report (European Commission 2021a) Hungary is part of the 'unexploited eGov scenario' – namely is still in an ongoing phase of digitalisation, but with a high number of citizens already using eGovernment services. Since IVSZ, all relevant **public services** are available online and the most important ones have their own structured online forms, online applications or applets. All other services are available via the e-paper online form service, which allows users to submit authenticated electronic documents. The development of the applications and forms is continuous. The digitalisation of the public administration in Hungary is predominantly supported by EU funds between 2013-2020 ⁽⁵⁾ and the Hungarian Recovery and Resilience Plan

4. Source: Hungarian Central Statistical Office 2015, Q2.

5. In the framework of the Development of Public Services Operational Programme (KÖFOP).

also includes several developments for 2021-2028. The implementation of such programmes has been uneven in certain levels of the public administration. While municipalities are mainly unable to invest into digital developments above the mandatory used web-based programmes (e.g. tax registration, filing, etc.) due to financial issues there have been significant developments in central administration offices.

In the **public administration sector**, the DGQS was completed by 146 respondents. One-third (66%) of the respondents reported that they use mobile devices at work regularly, mainly for in-company communication (28%), for planning or scheduling the performance of tasks (23%), for data measurement (20%) and for monitoring the performance of tasks (16%). Nevertheless, only 11% use mobile devices for interacting with service users. The tools are used in equal proportions (44%) for data measurement or to retrieve information and perform routine tasks. In total 99% of the respondents use ICT tools regularly, mostly for sending e-mails (34%), using web-based applications to exchange with partners' networks (22%) and to connect with public service users (20%).

Digitalisation has been spreading slowly but surely in all areas of **healthcare**. One of the most important digital developments in recent years has been the introduction of the Electronic Health Service Space (EESZT) in 2017. The system contains all patient health data, including life histories, past medical examinations, tests and prescribed medicines, and its use is obligatory for both public and private sector health care providers. Besides this, the use of digital networks has also become widespread and larger healthcare providers also have an intranet network where internal information and data traffic are managed. Although data transmission via e-mail and internet sharing is common, the benefits of internet-based systems are still limited in the health system. Even today, the transmission and processing of large amounts of data in poorly managed Excel spreadsheets is still common (FG23 and FG28). It is also problematic that even state-run institutions use different IT developments, whose compliance with legislation is often questionable. Although there are plans to develop a single IT system for public institutions, this process has hardly begun. Experiences with digital devices vary widely.

The most common devices are installed computers and smartphones. Healthcare workers use these tools in their daily work. These include tasks related to patient care, such as admitting patients, drawing up final reports, prescribing medicines, recording patients' conditions, compiling patient statistics, dispensing medicines, and ordering laboratory tests (INT21, INT24, INT27 and INT28). These tools are used in all outpatient clinics and somewhat less in inpatient care, especially in smaller rural hospitals, where manual documentation of patients is still common and not secure enough. Larger hospitals now have more sophisticated digital tools (e.g. smart beds that digitally control patient movement, or wristbands for safer patient identification). These tools, however, are not yet widespread and have been predominantly supported by EU funds.

Due to the low response rate, DGQS results, unfortunately, are not reliable/representative in the **hospital and health sector** (only 48 completed questionnaires). This information therefore should be taken into account in the following assessment. Regarding the use of digital devices and telework, more than half of the respondents (56%) regularly use mobile devices like laptops, smartphones, tablets, etc.; only 27% use them mainly to measure data, to collect/organise/retrieve information and 14% to interact with the users. 75% of the respondents use information and communication tools (30% e-mail and 34% web-based applications to exchange with partners' networks). However, there is virtually no use of machines operated by digital commands to perform certain operations (like lifting heavy loads/persons – 86% answered 'no'). Telework, remote work is not applicable in this case: only 9% of the staff could work from home, of whom 67% only do so one day per week.

3. Impact of digitalisation on job quality in the sectors

3.1 *Electricity production and supply sector*

3.1.1 Selected job quality dimensions

New digital solutions have significantly enhanced the safety of the electricity network, leading to a more balanced and even consumption of electricity, and have prevented system overload through gradual decentralisation. An important advantage of digital developments is that it has positively contributed to the **occupational health and safety** of workers ⁽⁶⁾. Electricity companies have started to use digital solutions to perform the most dangerous tasks carried out previously by workers. A good example for this is a new type of vehicle, which can assess the condition of these grids without users having to climb ⁽⁷⁾ (INT 1). On the other hand, more and more employees spend the entire day working in front of the screen, which has a significant negative impact on physical health: vision deterioration, bad posture in the absence of a proper office chair and wrist rest, and/or joint problems. The outcomes of the DGQS survey confirm this, as respondents reported vision problems (28%), back and neck pain (22%) and physical fatigue (16%). Additionally, digital solutions also could lead to the increase of stress. Mobile technicians receive a specific itinerary with an optimal combination of tasks. The system also takes into account where each worker starts from and, based on that, it creates the pairs for the day and the route to be taken. The GPS built into the vehicle and the mandatory data reporting on the work allows very

6. Other dimensions of job quality have been studied in the full country report for the project. These include work organisation, skills and learning, career prospects and employment security and workers' rights. Other dimensions of job quality have been studied in the more comprehensive Hungarian country report (see the project website <https://www.ose.be/digiqu@lpub>).

7. The user – instead of climbing up close to the high voltage grid – only needs to attach the vehicle to the grid and.

tight control by the shift supervisors and the management, who receive highly accurate reports on work efficiency (INT2 and INT4). A similarly tight-working pace is also typical for customer service jobs, where employees must answer a set number of customer calls and respond to a set number of e-mail enquiries. Their work performance can be measured, and they can also check at any time how much of their daily requirement has been completed (INT2 and INT5). For some jobs in certain electricity companies, the system sends a warning if no keystrokes or clicks have been received after a few minutes (INT2). These high requirements often lead to increased stress within employees. Stressful jobs can lead to burnout, frustration, high turnover rates and other health issues. These are not only harmful for the employee, but also have a negative effect on the employer, given the high costs of recruitment and training, in addition to the skills lost with the senior employee (INT1). Additionally, some employees (especially from the older generation) feel that they cannot – or cannot sufficiently – adjust to the quick changes, which may lead to frustration and mental stress in a highly digitalised world (INT4 and INT5). Based on the DGQS outcomes, the mental health issues suffered were mental fatigue (19%), stress (17%), lack of motivation or burnout (14%), and isolation or distress (9%). As many as 80% of the focus group participants agreed that regular use of digital tools made their vision worse, while 80% had back pain and 90% felt that their work was stressful.

Another interesting finding in the electricity sector with regard to job quality pertains to **working time and work-life balance**. One of the positive outcomes of digitalisation is the freedom related to the fact that work (or at least some kinds of work) is no longer connected to a fixed location. Teleworking, for example, could be a realistic option for white-collar workers, while blue-collar workers could benefit from the use of smart meters. These employment patterns were strengthened during the Covid-19 pandemic. Before, telework was rather a privileged option, notably for employees in some key positions for whom the place of work was irrelevant and who were not required to commute long distances on a daily basis. Most energy companies, then, introduced teleworking for large groups of employees during the pandemic. Alternatively, some employers introduced 'A' and 'B' weeks, dividing employees into two groups. The two groups worked alternately remotely and at the workplace, to reduce personal contact and prevent infection. Another option was to introduce a 'telework bank' (maximising the number of hours of teleworking) and employees could request to take up this option ⁽⁸⁾ (INT2). 19% of the respondents to the DGQS survey could do teleworking only because of the Covid-19 pandemic. At the same time, 32% reported that they could do all the time and 28% said that they could do part of their work remotely regardless of the pandemic. The proportion of those whose work could not be done remotely was 9% (for example, maintenance workers and technicians who need to be physically present). 50% of the respondents answered that they were allowed to work remotely

8. This makes it possible, for example, to take care of sick children without requiring the parents to take days off.

one day a week, 17% two days per week, while only 6% reported that they could do teleworking the whole time. In the light of the positive experiences with telework, energy companies decided to follow this path and worked out different hybrid work solutions.

Despite its flexibility, teleworking also has its risks. Since the employer has less control, strong self-control is needed – e.g. to prevent employees arranging private matters during their working time – resulting in them catching up by doing overtime or working unsocial hours. According to the DGQS survey, 50-80% of the respondents did not experience any changes in their working time as a consequence of digitalisation. However, 12% of respondents experienced some increase, while more than 5% felt a significant increase in their working time. 18% of the respondents to the online survey indicated that the amount of working time in unsocial hours had increased. On the other hand, nearly 20% agreed somewhat, and 26% strongly, that the time spent commuting to and from the workplace had decreased. As a negative consequence of teleworking, work-related phone calls occasionally occurred after working hours, which also contributed to the increase of working time. In case of the afore mentioned phone calls after working hours, most of the employees concerned highlighted that often it was not explicitly the length of time spent on phone calls, or answering e-mails which was disturbing, but rather that it fragmented time spent with family and friends, or the period of mental and physical recharging.

The boundaries between work and private/family life are less clear in the case of telework. For example, people check – and in many cases also answer – e-mails outside of their working time. Women, in particular, tend to do household tasks during the day and therefore work after the official working hours, even at night in order to finish their daily work (INT6). It becomes particularly difficult to separate work and private life when only one spouse works from home. As reported in the interviews, some households found it challenging to accept different working patterns within the family (e.g. teleworking after official working hours while the other has already finished their work, or different work schedules) (INT4). These situations have led to conflicts, in many cases, in the balance of work and family life. Therefore employees have had to find different solutions – insisting, for example, that they would only work in official working hours, not work/answer the phone/check e-mails after a certain time (e.g. after 6 pm) (INT6). A high level of awareness is required to find the right balance. These questions are expected to become even more important in the future and it is expected that the number of training courses and coaching sessions on this issue will increase in the near future (INT3). According to the results of the DGQS survey, 53.4% of the respondents said that digitalisation did not affect their work-life balance, or that they experienced only minor changes in the number of working hours, and that working time did not influence the time spent with their family.

3.1.2 Conclusions for the sector

Digitalisation has led to several positive changes in the electricity sector. It has eliminated the scope for human error, thus reducing the additional time, work and costs of repair. Many jobs have been made easier and faster (for example, AI calculates the shortest route for technicians arriving on site, and filters out callers who have a pre-loaded answer to a question or request). Increasingly, blue-collar workers also have smartphones and laptops, which enhances their digital literacy and helps them adapt to the rapidly evolving world of work. Energy-efficient solutions (such as smart grids) not only protect against the possibility of a major power outage, but also seek to minimise the environmental impact. On the negative side, digitalisation also has increased time pressure and allows tight control over employees – e.g. digital systems monitor every step and activity of mobile technicians, while customer service employees are often in a race against time to meet daily requirements. Online meetings and telephone conversations have replaced face-to-face ones, resulting in decreased social interaction among workers. Online training has become more impersonal and uniform, and while employees have more freedom to follow courses according to their own preferences, it might be challenging for workers who are less familiar with the online world. While the spread of teleworking is considered favourable, it also contains several uncertainties in connection with suitable working conditions.

3.2 Public administration sector

3.2.1 Selected job quality dimensions

While the research has led to some common statements in the field of **skills and learning**, due to the complexity of the public administration system, employees' experiences differ significantly. All public administration employees are obliged to fulfil further training and obtain a given number of credits as laid down in government regulations. These obligations vary from one legal status to another and can be divided into three categories: training programmes providing general public administration skills, professional training programmes and leadership training programmes.

The so-called professional training programmes include the development of digital and ICT skills too (Fási 2020). The training is provided by the National University of Public Service (NKE). Subject to certain conditions and within certain limits, public administration employees can also participate in internal training courses organised by other organisations.

Currently, 21 different training courses on digital skills are offered by the Pro Bono System ⁽⁹⁾ run by NKE – e.g. on public administration portals, platforms, cyber security, information security, data

9. <https://probono.uni-nke.hu/katalogus/kereses?szures=XQAAgABwAAAAAAAAAAAA0EsdHrvfTSftRfJqXyREQIDeeNkkfc9MNV4%2F0xGDT2m3bZWdQFD4dtpiGSBYNqyUYZgoNEobICJ99LRC8x8DibFLBYsj0zurYpzBYm%2FoXZK%2FruvcvosnFG0YQGHZQbQU9hgu0%2F%2F%2F7AAIAA%3D%3D>

protection, and closed and open-source software. Despite a common understanding on the importance and necessity of training courses ⁽¹⁰⁾ in the public sector, and an acknowledgement of the variety and accessibility of the NKE courses, neither our interviewees (INT12, INT14, INT16, INT17 and INT18) nor focus group participants (FG11, FG15, FG17, FG18 and FG20) were satisfied with the quality of the training.

Although certain trainings were already available exclusively online since the outbreak of the Covid-19 pandemic, only online courses have been launched, offering asynchronous training without tutoring. Online learning materials – with downloadable documents – are processed independently by workers, with an online self-test at the end of the course. For this reason, these courses are in fact self-education courses rather than training. Another important issue is that there is no allowance for taking the courses, and workers take them partly in their free time, and partly during less busy working hours. The compulsory training courses have been reported to cause financial constraints to municipalities: after these centralised courses have been paid, no further money is available for further training. This phenomenon, that municipalities cannot choose training courses according to their individual needs, may indicate that the autonomy of municipalities has been significantly cut down.

New entrants are typically trained by their colleagues. In a central public administration office (INT18), ICT training courses are organised for newcomers every six months, and senior colleagues train newcomers too – but without dedicated working time or formal mentoring.

Local government employees report that previous professional training and training on monitoring legislative changes and the application of law have been discontinued. Instead of this training, informal consultations between administrators and local government offices take place. Interviewees from the ministries reported that they use only basic programmes (Word and Excel) and that the functions of internet sites are restricted at work. In addition, they are not allowed to download external programmes and applications on their computers. They do not receive any training on digitalisation over and above the compulsory NKE training.

The situation differs somewhat in the territorial administration where – besides the compulsory NKE training – various other types of training courses are available too. An interviewee from a district government office reported that colleagues informally help each other to overcome challenges (INT14). In the case of new software, they are only given a description instead of an appropriate training course. The focus group results confirmed these statements and added that sometimes trainers did not seem to have an appropriate knowledge on the topic either. 48% of

10. Such as: training new entrants, monitoring changes in legislation, professional-methodological training, obtaining a (new) higher education degree, learning to use new databases and programme s.

the respondents to the DGQS survey considered that everyday work did not require them to develop new skills, while 30% answered that they only had to learn specific digital skills and 16% felt that they had to learn general literacy methods. 48% had received formal training provided by their employer and 24% had received training exclusively through on-the-job learning. Overall, 86% of respondents thought that the training provided more or less matched their needs. This last figure, however, contradicts the outcomes of the interviews and the focus group on the quality of formal training.

From an **occupational health and safety** perspective, digitalisation in the public administration usually means working the whole day in front of a screen. A decree adopted in 2000 by the Ministry of Health sets the minimum health and safety requirements for working in front of a screen ⁽¹¹⁾, and this regulation applies to workers who regularly use a screen-based device for at least four hours of their daily working time. Employers must assess regularly the risk of visual impairment, psychological strain, and physical impairment. The regulation sets minimum standards for jobs involving the use of computers, including the requirements for the screen, keyboard, desk, work surface, work chair, work environment and the human-machine interface. The obsolescence of the legislation is illustrated by the fact that in connection with the human-machine interface, it only mentions 'software' and 'systems', without any further specification. The provisions in the annex focus almost exclusively on workers' physical health (body, physical stress and the reduction of certain physical risks) while for psychological and mental health it only requires the employer to assess psychological risks. This means that occupational safety and health legislation on digitalisation is outdated. It covers only a few components and enforcement is problematic. The mental and psychological protection of workers is not covered at all, and the weakening of labour inspections in recent years has led to infrequent inspections. The new Labour Code, which came into force in 2012, no longer gives trade unions the right to monitor the application of working conditions rules, although they can represent workers in relation to their working conditions. Compliance with and enforcement of health and safety rules is an issue of concern. According to the interviews (INT14, INT15 and INT18), the government has gradually weakened labour inspection and control. Furthermore, workers do not know the rules in sufficient depth – despite mandatory health and safety training in all public administration jobs. For example, the law limits screen time to a maximum of six hours per day and requires a 10-minute break every hour, but in practice this is not enforced or monitored. Six out of the ten focus group participants did not even know these rules precisely.

Concerning the mental health risks linked to digitalisation, some people (INT16, 17 and 19) mentioned the psychological and mental impact of teleworking due to the Covid-19 pandemic.

11. Decree 50/1999 (XI.3.) of the Ministry of Health and Economy on the minimum health and safety requirements for work in front of a screen.

Other respondents felt that teleworking extends the working day while allowing continuous working and increases the risk of burnout (INT14 and INT18). Many found video conferences very tiring and even exhausting. Missing or inadequate support for new and modified IT programmes increases mental health risks too, and without proper preparation for change or learning of new systems and programmes, it can lead to increased stress. Several interviewees see mental workload as a complex issue, of which digitalisation is only one factor. They also blame tighter deadlines leading to mental and physical stress symptoms. To reduce physical and mental risks and prevent health deterioration, several of the employers have offered free well-being services to their employees – e.g. massage, physiotherapy, back exercises, yoga or a swimming pool ticket. Unfortunately, these services have been mainly suspended due to the Covid-19 pandemic and the lack of financial resources, as well as organisational difficulties in some cases.

The results of the DGQS were consistent with the results of the interviews and the focus groups discussion, i.e. that workers perceive the impact of stress on physical health more than on mental health (surprisingly, mental health impacts were not perceived by 70% of the respondents). According to the results of the DGQS, the most common physical symptoms were vision problems (23%), neck pain (18%) and back pain (17%), while mental fatigue (25%), stress (22%) burn-out (18%) and anxiety (12%) were the most frequently cited mental health issues. This also shows that employees in the public sector were less aware of the mental and psychosocial effects and risks, than physical ones.

The **collective rights** of employees in the Hungarian public administration are quite limited. The legislation allows staff to set up a trade union, consult, strike – although in a limited way – participate in workplace, sectoral, and national interest conciliation forums, and conclude agreements in these consultative forums. However, there are no rights relating to participation, collective bargaining, and the conclusion of collective agreements. Employees and trade unions are not involved and consulted on the design and implementation processes of digitalisation at work and in practice, they cannot enforce such consultation. The sectoral and national consultative forums have been stagnating in recent years, with no meaningful consultations or negotiations taking place. However, this is not due to digitalisation, but rather to a lack of political will.

According to trade union officials, the number of trade union members has declined significantly in recent years due to institutional reorganisations, and partly to the difficulties in organising and their reduced capacity for advocacy (INT13, INT17 and INT20). Three interviewees (INT13, INT17 and INT20) reported workplace intimidation and pressure in the public administration because of trade union membership. At the same time, digitalisation has made it easier for trade unions to engage with their members. They can operate websites, are present on social media, organise online video conferences, reach people apart from their members with newsletters and organised online voting during the Covid-19 pandemic.

3.2.2 Conclusions for the sector

The levels of digitalisation vary considerably between the different areas of public administration. While the employees of central public administration agencies work with the most advanced tools and programmes and uniquely provide adequate ICT training in the efficient use of the programmes and databases, there have been hardly any developments at district level offices and ministries in the last five years. Employees in these offices were only given the mandatory ICT training – by the National University of Public Service (NKE) – which achieves a very low level of employee satisfaction. Municipalities carry out ICT system developments in accordance with their financial resources. Local government workers are afraid that government-led digitalisation is a tool for centralisation, which will further reduce their autonomy by reducing the number of cases they deal with.

Teleworking was unknown in public administration until the Covid-19 pandemic. Municipalities – depending on their financial means – adapted flexibly to the situation and introduced teleworking, setting out the rules governing it in local regulations. There were considerable differences in the use and the scale of teleworking, varying from a total ban to a partial authorisation depending on the services provided. There was a typical return to office work between the waves of the pandemic, excluding central offices. Apart from the central offices, no other departments are considering the introduction of teleworking in the medium or longer term.

3.3 Hospital and health sector

3.3.1 Selected job quality dimensions

Based on the outcomes of the focus group discussion, digitalisation has not been accompanied by greater autonomy and has not had an impact on the evaluation of work performance. Rather, it has meant closer collaboration between the doctor and assistants in the clinics, which is particularly characteristic of the use of the electronic health system record (EESZT), but also the result of a poorly regulated situation. In larger hospitals, collaboration at patient handover is also facilitated by the electronic recording of patient interventions, as this facilitates the work of successive shifts. Under current regulations, only doctors have access codes to the electronic digital space, but administration is largely done by assistants and nurses, using the doctors' access codes. It is true that a doctor's signature is subsequently required on the document thus created, but in this way the actual work carried out by the assistant appears as the doctor's work (INT26, INT28).

From a workflow perspective, the dominant opinion in the hospital sector focus group discussion is that the benefits of digitalisation are easier management and the retrieval of large amounts of data (FG23, FG28). The time taken to move patient documents is sometimes reduced, as

electronically recorded documents are transferred to the examiner or the doctor who issues the documents without anyone having to leave the office. From a therapeutic point of view, the disadvantage of a remote diagnosis is that the patient is no longer present at the time of the evaluation of the results, so the doctor evaluating the findings may be less involved with the patient, may only evaluate some of the findings, or may not be able to order additional tests immediately. While the quality of work and patient safety are more likely to benefit, digitalisation solutions may also reduce personal contact with patients, increasing the risks, e.g. for children or unconscious patients, where personal observation is also very important (FG24, FG27).

According to several of the participants in the focus group, digitalisation has had positive impacts on the **work organisation** of hospitals with significant staff shortages: it has reduced demand for staff, led to a reduction in the typically high number of overtime hours and substitutions, and has resulted in a more favourable distribution of the existing workload among the workforce. A good example of this in a hospital setting is pathology, which is still only partially automated, especially on the laboratory side. A significant shortage of specialist staff is being remedied by digital diagnostic tools (FG21, FG24 and FG26).

In health care institutions, the information available is scattered between many places, typically in separate systems. For example, there is typically a lack of communication between the facility management and the staff performing the operations, which would be a prerequisite for a smooth operation during treatment and hospitalisation. Digitalisation offers the opportunity to connect disparate work structures and dispersed information and to fully exploit the potential of information. It emerges from the interviews (INT21, INT22, INT24 and INT27) that digitalisation (also) typically improves working conditions and work organisation, enhancing the coordination of tasks, reducing dual work and increasing efficiency. Digitalisation has also clearly improved the quality of work by leaving less room for error, by monitoring processes in real-time. Many alarm parameters are set so that the system sounds a warning if certain critical values are exceeded that people might overlook. The system automatically transfers the measured parameters to the documentation, eliminating typing errors. Much less handwritten information is used that could be potentially misread; a lot of data is entered online by machines (INT26).

Many security features are built in, with persons only being allowed to enter departments after authorisation, and devices only being used after user identification. With these levels of responsibility, everything can be traced back due to well-defined data recording.

At the same time, there is also a view that over-reliance on digital tools makes it easy to overlook the finer detail. According to almost three quarters of the participants in the focus group, digitalisation has typically increased the routine nature of tasks, as digital data processing follows a set protocol, algorithms, and templates: 'in the intensive care unit, the nurses almost don't even

have to think about setting up the drug dosage and feeding, they just have to set the desired values and the device does the necessary calculations for them' (FG30).

However, some argue (FG22, FG25, FG26) that digitalisation has also reduced routine by replacing some of the routine tasks that were previously required. There was also a view that routine decreased when digitalisation was first introduced because the work had to be checked more often, and increased later because it became routine. According to the majority of interviewees, digitalisation has typically increased the autonomy of employees in the workplace. Diagnostics can be performed without the need for a central laboratory. By setting alarm values for certain tests or devices, there is no need for another person to monitor an intervention, and consultation with a doctor is only necessary in problematic cases. But it may also be the case that some digitalised processes do not allow deviation, thus limiting the autonomy to perform the task.

Occupational health and safety in the healthcare sector is supported by tools that eliminate or reduce the physical strain of caring for patients, such as digital beds, or the risk of infection associated with reducing invasive interventions, such as digital intervention-based diagnostics or surgical tools. However, their uptake is not universal, but rather limited to large, high-profile hospitals. Digital devices, especially in work areas where a lot of work is done in front of computers, often lead to eye and muscular overstrain, and there are fewer solutions available to compensate for this (e.g. massages at work, protective goggles). Digitalisation has also reduced some of the psychological pressure of high levels of medical responsibility: it has reduced the potential for error, e.g. in the administration of medicines, safer diagnoses or prescriptions, according to the focus group.

Almost two-thirds of the interviewees for this project said that they had not experienced increased exposure to physical risks (back pain, shoulder and arm pain, etc.) as a result of digitalisation, and that electric desks or beds and internet connection saved workers a lot of physical strain, walking, etc. However, one third of the interviewees reported loss of vision, back, head, and neck pain, and increased exposure to 'electro smog' due to the many electronic devices and WIFI.

A few interviewees reported a reduction in exposure to psychosocial risks ('Stress at work is reduced by being able to see what might be 'wrong' sooner than, for example, a blood gas analysis. You get immediate and safe results, which makes it easier to deduce the condition of the patient, so stress is definitely reduced' (INT21). On the other hand, any stalling of programmes or machines causes stress and data processing burnout. The constant sounds and noise emitted by equipment also increases stress. As one interviewee said: 'Sometimes I wake up at home to the sound of monitors and ventilators alarming me, and I think that is definitely harmful' (INT30).

The interviewees had different points of view on the impact of digitalisation on mental health. Some say that digitalisation has no such impact and that the elimination of manual copying of data saves nurses a lot of stress. Some people feel more mentally tired when they look at a screen, although some say that, because it makes work more colourful, it also reduces the potential for burnout. Stress is exacerbated by inadequate training in the use of digital tools and methods.

However, almost two-thirds of the interviewees said that digitalisation had typically increased the intensity of work. Work intensity is enhanced by the immediate access to laboratory values and diagnostic imaging results; by being able to monitor more parameters at the same time; by anything which means that more tasks/patients can be treated in a unit of time. In response to the question on the impact of digitalisation on physical and mental health, 53.4% of the DGQS respondents declared either a new physical pain/condition (38.1%), or a worsening of an existing physical pain/condition (14.3%). 38.1% of the respondents did not notice any changes in the related field. Most of the respondents to the online survey mentioned vision problems (25.6%) and neck and back pains (20.5%+17.9%, 38.4% altogether).

Most of the respondents (71.4%) have not noticed any impact of digitalisation on mental health. However, some reported stress, mental fatigue, depression, burn-out (14.3% + 4.8%, 19.1% altogether). In order to support digitalisation, improvements have been made to the physical environment (e.g. better chairs, standing desks, according to 11.1% of respondents) and teleworking has been introduced or extended (11.1%). According to 66.7% of the respondents, no action has been taken to make improvements.

As regards to **learning and skills**, long-learning processes prior to the introduction of digitalisation tools were not common, although they are essential for their professional use. The training given on changes that affected a larger number of staff, such as the introduction of the Electronic Health Service Space, or the installation of ventilation machines during the Covid-19 pandemic, consisted mainly of short distance-learning sessions, which were mostly felt to be insufficient by those involved. There was a complete lack of information for trade unions, which could have been involved in training, and in making older workers more receptive to digitalisation.

There is no IT training in the mandatory credit courses, and no incentives for such training. It is therefore not surprising that there is a large digital divide, which generates anxiety, especially among older people. More mature workers are less attracted by higher levels of digitalisation. The reluctance of older workers to use digital tools is also a source of stress for them. Among workers, digitalisation is more attractive to young people, who are more confident with digital tools and receptive to new solutions (FG23, FG26 and FG29). The uptake of these tools is hampered by a large older generation of employees who have not received adequate timely training and are

reluctant to use computers, and by employers who have not taken enough care to provide adequate training for their staff (FG22, FG24, FG25 and FG27).

In the larger county or metropolitan hospitals, the level of staff training, especially for specialist nurses, graduate nurses and doctors, is higher, but the scarcity of digital equipment limits the use in everyday work.

The effective use of digital tools and methods, and the reduction in workplace stress brought about by digitalisation, also depends on adequate training and skills development in the workplace on the use of these tools and methods. The hospital sector focus group participants agreed that training of medical staff in digital skills should also include a section on cybersecurity. Also, when using electronic health records, healthcare personnel should be aware and trained in the EU General Data Protection Regulation (GDPR).

According to the interviewees' responses (INT 21, 23, 24, 25, 27, 28, 29), there were no major difficulties in developing the skills and qualifications needed for digitalisation – they were positive on this question. There is no doubt that digitalisation allows easier access to learning materials: in online learning, where teaching theory is easier, one does not need to be physically in the same room as the instructor; the material can be re-watched; practical knowledge can be partially mastered with special programmes; illustrative video material is provided; it motivates young people. Initially the introduction of new digital tools makes it particularly difficult for older people to work, and workers from less-developed regions may have less experience and knowledge of digital tools.

However, most interviewees also mentioned some negative aspects of the digitalisation of training. Digital learning, for instance, has replaced physical presence at the expense of social interaction. It is also important to note that there are parts of the healthcare sector where personal involvement is absolutely necessary (nursing; practical activities; activities requiring special equipment, e.g. chest compressions on dolls; defibrillation; injections). There are simulation tools for specific direct skill development, which have been awarded EU grants, but are mostly used in the training of physicians, and not yet nurses.

Some of the interviewees (INT25, INT28) consider the training to be adequate, especially the intensive class. There are some who prefer several stages of training, including theoretical, and, if necessary, practical training. However, the level of satisfaction depends on the individual. There were also respondents who considered the training they received unsatisfactory, some who found it to be too general, and some who required more training. It is also seen as unfortunate when only the manager in the team is given a broader briefing and later passes on the information to colleagues. According to most of the respondents, young people are at an advantage, as they are

already well established in the digital world. We found that the age of nurses was lower in departments where more digital tools were used, such as the extended care unit (ECU) and the intensive care unit (ICU).

Five out of the eleven respondents said that education does not influence a person's attitude toward digital tools (good support is important), but it is undeniable that those with some IT background find it easier to learn new things, as well as those with higher educational qualifications. What matters here is not necessarily the level of education, but rather the field in which someone was trained before working in healthcare.

Half of the respondents to the DGQS answered that the introduction of digital tools and processes in their everyday work required them to develop some new skills – general and specific digital literacy methods and digital skills (22.8% + 27.3%) – but nearly one third (27.3%) answered that no new digital skills were required. 31.2% of the sample reported to have received training related to the utilisation of specific digital tools and 43.7% did not receive any training from the employer. The employer provided some kind of training for only 37.4% of the sample. It is no wonder that 18.7% of the respondents learned informally (i.e. on-the-job learning; exchanges with colleagues). Half of the respondents were partly satisfied; half were not satisfied with the training ('not enough time and resources were dedicated to training').

3.3.2 Conclusions for the sector

The situation in the labour market, financial constraints, and the constantly increasing costs of operation and maintenance due to high inflation in the cost of digital tools are important factors in the digitalisation of the hospital/healthcare sector. All of this poses a serious challenge to the budgets of hospitals (and of course other healthcare institutions). The digitalisation of hospitals, partly by reducing the costs of organisation and operation, can help alleviate these pressures, and the use of modern healthcare tools, such as robotics in healthcare, can help to improve the quality of patient care.

The interviewees in this sector reported the following positive and negative trends over the past five years.

Positive trends:

- Renewal and replacement of digital equipment; more accurate monitoring and diagnosis.
- Remote access, e.g. Holter monitors, home monitors.
- More transparent and controllable workflows.
- Increased patient safety; more detailed monitoring of patient conditions, reduced need for patients to attend in person.
- Point of care system, bedside diagnostics – faster results, faster initiation of therapy.

- Cloud-based data storage.
- Improved access to patient records by both the doctor and the patient (EESZT).
- Online communication.
- Access to grant funding.

Negative trends:

- No significant progress has been made in the building of digital infrastructure and harmonisation of tools.
- In the event of a failure, the whole system is blocked.
- Lack of maintenance, many machines are 'worn out' and it is very difficult to replace them.
- Access to patient records can have negative consequences (data security risk).
- Personal relationships can be overshadowed – less personal contact.
- Additional work (preparation of equipment), possible increase in service time.

There are barriers to the shift to digital hospitals: undoubtedly budgetary constraints (one of the biggest), but also the potential resistance of the workforce (which, in the healthcare sector, is typically ageing) and a skills shortage. Trade unions can also play a role in breaking down resistance by helping overcome fear of the unknown and psychosocial barriers. In addition, on-the-job training and retraining can play a crucial role in developing skills and reducing fear of the unknown.

Trade union wage bargaining should also take it into account that staff wages should reflect the specific skills needed to operate the technology. With the advance of digitalisation in the health sector, including the hospital sector, special attention should be paid not only to the economic side but also to the specific aspects of patient safety, and special cyber protection solutions, which are essential not only for patients but also for staff working in digitalised working environments. A cybersecurity approach must also be included in the digital development strategies of healthcare institutions and the development of staff competences.

Digitalisation is clearly the future for hospitals in the country according to the majority of interviewees and focus group participants. However, digitalisation-related developments are costly; this puts underfunded healthcare providers and hospitals in a particularly difficult situation, where even basic infrastructure improvements are difficult. This also means that most of the improvements may need to be financed by EU funds. When digitalisation is implemented with external ad-hoc funding, there is a risk that the process will become fragmented, the elements will not be connected, and long-term sustainability will fail.

4. Impact of digitalisation on social dialogue

In the past few years – as also underlined in the 2022 country report of the European Commission (12) – the importance and channels of social dialogue were seriously weakened in Hungary because of the political situation. That means that social partners are involved in policy debates less frequently and their opinion is also less probably built into the final legislation or measures. The debate about digitalisation is no exception to this evolution.

So far, the debate about the topic of the impact of digitalisation on the world of work has taken place only on one occasion in the Hungarian social dialogue, namely during a seminar organised by the European Trade Union Confederation (ETUC), on the European Social Partners Framework Agreement on Digitalisation (European Framework Agreement on Digitalisation 2020) between employers' and workers' organisations in 2021. In this forum, the representatives of Hungarian trade unions and employers' organisations agreed that digitalisation is already in progress and is present in every segment of the labour market. It will lead to the creation of new jobs – even if for the time being, it is more likely to eliminate jobs in Hungary.

4.1 Electricity production and supply sector

Although the digital evolution has been underway for several years in the electricity sector, with important consequences on the job quality of workers (physical and mental health of workers, with a special attention to working in front of the screen, working time, etc. – see above), this topic hardly ever comes up in the social partners' discussions and has been flagged neither by the employers, nor by the trade unions.

Consequently, sectoral or workplace level dialogue has not been carried out on the topic, neither has it appeared in collective agreements. Some companies, however, contribute to the improvement of mental and physical well-being of their employees – e.g. by providing them with fresh fruit or vegetables once a week – and this trend is expected to continue. In line with this, the traditional company doctor might be joined by an occupational psychologist and an increasing proportion of training courses will focus on stress management and work-life balance. Given the expansion of teleworking, e-learning and the increasing use of digital systems, it seems inevitable that in the future wide-ranging debate will be conducted on the impact of digitalisation on work and on the physical and mental health of workers.

4.2 Public administration sector

Collective bargaining and collective agreements are not allowed in the public sector in Hungary, but workers have the right to participate in consultative forums at workplace, sectoral and national

12. https://commission.europa.eu/system/files/2022-05/2022-european-semester-country-report-hungary_en_0.pdf

level. In these forums, the issue of digitalisation has not yet been raised. In the context of managing the Covid-19 pandemic, trade unions asked to be involved in the consultation on teleworking rules. However, with rare exceptions (such as the case of the municipality of the capital) this did not happen and there is no known agreement on the subject. Formal channels for workers to make their voices heard do not work in Hungary.

Civil servants' rights, working conditions and remuneration were guaranteed by employment rules, but these have been phased out, step by step. In the absence of collective bargaining, the functioning of the consultative forums should be essential: partners could exchange information, inform each other, consult and negotiate to reach an agreement. The lack of real consultations is the main reason for the highly critical attitude of trade unions toward the government. Among the points discussed in the national and sectoral forums, the issue of digitalisation was raised in relation to the Covid-19 pandemic, especially in connection with the right of teleworking. Unfortunately, the deliberations within the consultative forums have not been able to effectively influence the development of the regulations. At present: challenges, programmes and activities related to digitalisation are not the focus of attention in the sector.

4.3 Hospital and health sector

There are no sector-wide agreements on digitalisation in the healthcare sector. According to a summary report by the FESZ (Independent Health Care Trade Union, 2022), dialogue with workers in the health sector is minimal. It is mostly limited to the allocation of work tasks, and there are no regular national or local forums for health employers to discuss strategic issues ⁽¹³⁾.

Currently, trade unions are not involved prior to the digitalisation process in hospitals. Ex-post criticism results in corrective action in the best cases. The introduction of digital technologies does not in itself provoke resistance, but lack of preparation and excessive administration make adaptation difficult. Precisely in the light of the circumstances identified in this research, it is recommended that social partners, local and/or sectoral, professional employee representatives, trade unions, health and safety representatives, etc., be involved in digitalisation processes, in order to maximise the benefits and minimise the disadvantages for employees.

13. However, in 2022 during a discussion with the State Secretary for Health, the FESZ had the opportunity to raise the topic of the poor IT conditions.

5. Cross-cutting conclusions

The previous section argued that there is currently no national or sectoral forum in Hungary where the topic of digitalisation could be tripartite discussed.

The National Digitalisation Strategy 2022-2030 and the Hungarian Recovery and Resilience Plan ensure the framework for digital developments with many encouraging tools and – in case of an agreement with the European Commission – financial resources. **Social partners**, however, were **not properly involved** with the preparatory work (INT13, INT15)

As a result of the digital evolution many digital solutions were already present in the three examined sectors (e.g. smart meters and online applications in the electricity sector; user-friendly applications and online filing in the public administration; and the electronic health system record (EESZT) in the health sector since 2018). The **Covid-19 pandemic gave a new impetus** for digitalisation in many sectors, mainly with the aim of protecting employees and ensuring quality and safe services at the same time. Besides this, the pandemic placed extraordinary pressure on the health care system in Hungary. All these changes require continuous adaptation from workers, which could be especially challenging when neither they nor their representatives were involved in the preparation of the digital development, and were not provided with proper information during the introduction of the changes.

Many companies and organisations introduced **teleworking** in jobs where the personal presence of employees was not highly necessary – e.g. teleworking was not an option for electricity technicians or health care providers, but customer service employees could telework in large numbers. The public sector, in this respect, was not unique as teleworking in ministries – with some rare exceptions – was not allowed, while municipalities made it a choice for their employees. It is worth mentioning that even with those employers where teleworking was an option, it was not discussed with social partners' organisations. The only exception from this was the metropolitan municipality of Budapest. Teleworking affects many aspects of job quality, including **work organisation** itself but also **working time**. To varying degrees, employees reported that increased teleworking led to a rise in working hours, including in unsocial hours. In some cases, the availability of workers outside of the working time was an issue too. On the positive side, most employees concerned reported a significant, or slight, decrease in commuting time. Teleworking also had a high impact on **work-life balance** (boundaries between work and private life were not obvious, family conflicts, etc.). Workers often checked their e-mails and even answered them after working time, by their own choice. Arranging private issues during working time, household tasks and childcare responsibilities (especially in case of women) often led to work outside of official working times even in unsocial hours, including nights. Many workers are not familiar with the rules of occupational health and safety, which can cause **physical and mental health risks** (eye and muscular overstrain, including back and neck pain). The fact that health

and safety rules on working in front of the screen are outdated and contain rules almost exclusively on physical health, make the situation even more difficult.

Digitalisation, however, has obviously **reduced physical risks** in certain cases. (e.g. the previously mentioned digital tool in the electricity sector). The effect of digitalisation on mental wellbeing and stress is controversial. On the negative side, it has led to a high level of control over employees (e.g. in the electricity sector, where all actions and movement of technicians and call centre operators are followed) but in the health sector it has reduced some of the psychological pressure of high levels of medical responsibility: it has minimised the potential for error, e.g. in the administration of medicine; safer diagnoses and prescriptions. Adjustment to quick changes, however, could be challenging for some employees – especially from the older generation. Some employees (especially from the older generation) feel that they cannot – or cannot sufficiently – adjust to the quick changes, which may lead to frustration and thus increase mental stress at work.

As a result of digitalisation, more and more **training** is held online. While most employees acknowledged the flexibility of online training, some of them felt the lack of personal interactions and sense of community. In this respect, online courses with online materials and a self-test at the end are considered more self-study solutions than traditional training. It seems a general issue too, that employees are not provided with proper training when introducing new digital tools or systems, and on-the-job training for new entrants is not usually organised either. These skill developments, therefore, mainly happen occasionally – e.g. with the help of manuals, or senior colleagues giving the most important information to newcomers. Workers with lower levels of ICT skills – especially from the older generation who did not grow up in a digitalised world – often face challenges during online learning.

Digitalisation did not affect **workers' rights** per se; however, digitalisation has made it easier for trade unions to engage with their members. They operate websites, are present on social media, organise online video conferences, can reach people apart from their members with newsletters, and organised online voting during the Covid-19 pandemic.

To sum up: **digitalisation has had both important positive and negative effects on job quality**. Governments together with social partners should strive to provide an environment where, while maximising the positive impacts of digitalisation and ensuring its benefits to a wide range of employees as possible, also manage its possible negative consequences effectively.

6. Policy recommendations

Recommendations to national stakeholders

1. Key stakeholders, including employee and employer representatives and professional organisations, should be involved in the development of the national, sectoral and workplace **digitalisation strategy**, in the collection of proposals and in the discussion of the material to be produced.
2. In developing the strategy and its implementation plan, stakeholders should take it into account that digitalisation and the related tools and methods are an **opportunity** that can be best exploited if the workforce is as highly skilled as possible.
3. Stakeholders should also address the issue of the **financial resources** required for the introduction of digitalisation. This is particularly important in the under financed health sector. The allocation of national and international (EU) funds is essential for this purpose.
4. In the public administration, trade unions call on the government to ensure:
 - substantive **consultation** and negotiations with their organisations;
 - properly functioning sectoral and national **social dialogue** institutions;
 - restoration of **trade union rights**.
5. There are significant **gaps in the level of digitalisation** in different areas of the public administration. Trade unions demand uniform treatment in access to digital tools and in the provision of high-quality training opportunities. This also requires the provision of financial resources to local and regional municipalities, including the replenishment of resources which have been severely cut or withdrawn by the central government on several occasions in the wake of the pandemic.
6. The mental and psychological protection of workers against negative impacts of digitalisation is not covered at all, either by health and safety rules or by labour inspections. Due to the weakening of labour inspections in recent years, such inspections are rare, and the rights of trade unions in the field of occupational health and safety have been abolished. The present analysis also supports the recommendation to carry out an occupational health and safety **risk assessment** concerning the psychosocial/mental burden associated with the introduction of digital solutions, before the introduction of digital tools and methods.
7. Keeping up with digitalisation and renewing and maintaining the necessary knowledge is particularly important for **older workers**, partly because of the ageing workforce. In state-

owned enterprises and public institutions, the age of employees is even higher than average. Leaders must therefore pay particular attention to the issue of intergenerational cooperation, as this situation can create regular friction in everyday life that needs to be consciously addressed.

8. Healthcare institutions should be encouraged to formulate their own digital **organisational strategy** guided by medium- and long-term objectives, which should reflect the views of all stakeholders (patients, doctors, professionals). Employees should be involved and informed about possible strategic goals before planning/development.
9. Take more emphasis by carrying out **surveys** and **in-depth analyses** on the possible effects of digitalisation on the Hungarian labour market in order to identify skills-needs more precisely. In line with this, equip workers with the relevant skills and take ICT skills in the focus of training at all levels. Discussions on this issue should be carried out at national, sectoral and workplace level.

Recommendations to European stakeholders

1. The impact of digitalisation on the labour market and the digitalisation of work processes are **important challenges** that should also be addressed at European level. Questions to be discussed could be, for example: To what extent and in what areas can digitalisation replace existing jobs? How are digitalisation, new tools and methods received by those working with it/them and by clients?
2. One of the common tasks at European level could be the development of **online courses** on new digital tools or processes, possibly including the creation of high-level animated online learning materials and courses, **study visits**, exchanges of experience, and the extension of existing frameworks (e.g. Erasmus).
3. International cooperation can be particularly effective in the field of digitalisation-related **cyber defence**. For public services, the protection of digital systems, data, strict control and purpose limitation of access to data are essential for both users and service providers. Protection should also cover the issue of supervision and controllability of workers using digital tools. The international aspects of cyber security are particularly relevant in the energy sector, where electricity networks extend across national borders. Therefore, in the near future, even closer cooperation is needed, involving the sharing of system developments, innovation activities and implementation of cross-border projects in order to further increase the efficiency and integration of electronic systems.

4. Since the introduction of digitalisation is costly, European decision-makers should pay particular attention to the **availability of European resources** to facilitate such developments. In this context it would be useful, for example, if hospitals and healthcare institutions facing digitalisation were given the opportunity to apply for EU funds directly in a targeted manner. In other words, a certain decentralisation of EU funds in this area could help hospitals avoid a position where they would be short of resources.
5. In addition, the **involvement of the social partners** at all levels should be a key condition for EU funding. They should be involved in the preparation, decision-making and implementation of digital solutions at national, sectoral and local level. On the employee side, trade unions whose members are most affected by the objectives of the application should be represented in the national monitoring committees. The allocation of EU financial support should be subject to compliance with this condition.

Annex 1: List of interviews

ID	Institution	Sectors	Position	Date	Method
INT1	Trade Union of Electricity System Managers and Operators	Electricity	Chairman	01.03.22	Zoom
INT2	North Transdanubian Electricity Trade Union	Electricity	Chairman	01.03.22	Zoom
INT3	South Hungarian Electricity Trade Union	Electricity	Chairman	03.03.22	Zoom
INT4	Technical Workers' Interest Group Paks Nuclear Power Plant	Electricity	Chairman	04.03.22	Zoom
INT5	Tiszántúli Electricity Industry Trade Union.	Electricity	Secretary	07.03.22	Zoom
INT6	Budapest Power Plants Trade Union	Electricity	Vice chairman	08.03.22	Zoom
INT7	South Transdanubian Electricity Workers' Union	Electricity	Chairman	09.03.22	Zoom
INT8	Mátra Power Plants Trade Union	Electricity	Chairman	10.03.22	Zoom
INT9	Hungarian Electricity Workers' Union	Electricity	Vice chairman	10.03.22	Zoom
INT10	Paks Nuclear Power Plant Workers' Union	Electricity	Chairman	11.03.22.	Zoom
INT11	KSZSZ	Public administration (PA)	President	01.03.22	Zoom
INT12	MKKSZ	PA	Regional secretary	01.03.22	Zoom
INT13	MKKSZ	PA	President	02.03.22	Zoom
INT14	MKKSZ	PA	Secretary	03.03.22	Zoom
INT15	MKKSZ	PA	Chairman	08.03.22	Zoom
INT16	MKKSZ	PA	Trade union steward	08.03.22	Zoom
INT17	KSZSZ	PA	Chairman	09.03.22	Zoom
INT18	MKKSZ	PA	Secretary	10.03.22	Zoom

Annex 2: List of focus groups

ID	Trade union affiliation	Sector	Occupation
FG1.1	MKKSZ: Trade Union of Hungarian Civil Servants and Public Service Workers	Public administration	Notary coordinator
FG1.2	MKKSZ	Public administration	Public area inspector
FG1.3	MKKSZ	Public administration	Public area inspector
FG1.4	MKKSZ	Public administration	Administrator of the body of representatives
FG1.5	MKKSZ	Public administration	HR administrator
FG1.6	MKKSZ	Public administration	Notary clerk
FG1.7	MKKSZ	Public administration	Tax administrator
FG1.8	MKKSZ	Public administration	Financial administrator
FG1.9	MKKSZ	Public administration	Archiving administrator
FG1.10	MKKSZ	Public administration	Social affairs administrator
FG2.1	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.2	Independent Trade Union of Health Workers	Hospital	Assistant
FG2.3	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.4	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.5	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.6	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.7	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.8	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.9	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.10	Independent Trade Union of Health Workers	Hospital	Patient transporter
FG2.11	Independent Trade Union of Health Workers	Hospital	Patient transporter
FG2.12	Independent Trade Union of Health Workers	Hospital	Operating theatre assistant
FG2.13	Independent Trade Union of Health Workers	Hospital	Operating theatre assistant
FG2.14	Independent Trade Union of Health Workers	Hospital	Operating theatre assistant
FG2.15	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.16	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.17	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.18	Independent Trade Union of Health Workers	Hospital	Nurse with high school degree
FG2.19	Independent Trade Union of Health Workers	Hospital	Patient transporter
FG2.20	Independent Trade Union of Health Workers	Hospital	Specialist nurse

FG2.21	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.22	Independent Trade Union of Health Workers	Hospital	Nurse
FG2.23	Independent Trade Union of Health Workers	Hospital	Public health controller
FG2.24	Independent Trade Union of Health Workers	Hospital	Nurse with high school degree
FG2.25	Independent Trade Union of Health Workers	Hospital	Administrative
FG2.26	Independent Trade Union of Health Workers	Hospital	Specialist nurse
FG2.27	Independent Trade Union of Health Workers	Hospital	Assistant
FG2.28	Independent Trade Union of Health Workers	Hospital	Specialist nurse

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