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**The impact of
digitalisation on job
quality and social dialogue
in the public services: the
case of Italy**



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EXECUTIVE SUMMARY

This report is part of a larger European research project on '*The impact of digitalisation on job quality and social dialogue in the public services (DIGIQU@LPUB)*', led by the European Social Observatory (OSE) and funded by the European Commission. This work also benefits from support from the European Public Services Union (EPSU).

In recent years, public service workers are increasingly using connected organising tools and methods, which shape the way their job tasks are implemented, scheduled and controlled. In this context, the Digiqu@lpub project aims at: (i) Assessing the impact of digitalisation on job quality dimensions from the perspective of trade unions but also of public service workers themselves; (ii) Investigating how the challenges and opportunities for job quality generated by the digitalisation of work in public services are addressed in social dialogue (at national and sectoral levels) in selected EU Member States.

At the core of the project are eight case studies in as many countries: Denmark, France, Finland, Germany, Hungary, Italy, Poland and Spain. This report contains the Italian case study. Three sources of data are used to address the research question (interviews conducted with trade unionists and workers; focus groups with field workers; data from an original web survey).

As stated above, this report analyses the impact of digitalisation on job quality and social dialogue in Italy. Like the other case studies, the research targets three public service sectors: electricity suppliers, public administrations and hospitals. The present summary is focused on the sections 2, 3 and 4, which use original research material.

Key findings

The overall impact of digitalisation on job quality in the analysed sectors depends very much on the technology adopted. In the case of the electricity sector, some technologies such as drones, and software management programs have overall increased job quality, as these instruments have favoured job safety, upskilling and work-life balance. However, the use of applications on smartphones has significantly worsened job quality, leading to higher work intensity, longer working days, and a reduction in safety.

With regard to the public administration, the key change brought about by digitalisation has been the possibility for employees to work outside of the office. This opportunity is still very limited in the Italian public administration, but those workers who experienced it, mainly during the Covid-19 pandemic, commented on the lack of adequate devices and technology infrastructure, the risk of over-work because they lack the abilities to organise their own work around objectives, and negative effects on mental health; nevertheless, workers appreciate the ability to achieve a better work-life balance as a result of remote work.

The hospital sector is maybe, among the three analysed, the sector that has experienced the most pervasive digitalisation: introduction of a wide range of technologies, such as robots in the operating room, tablets to collect data and monitor patients' intake, and the implementation of electronic medical health records. In general terms digitalisation has improved job quality in hospitals, mainly by making the work-flow smoother and increasing safety.

In recent years, as the pace of digitalisation has increased, impacting more and more areas within the public sector, social dialogue has had to adapt to take into account these changes, particularly given the impact of technology on work organisation, job quality, health and safety, job classification and employment. Unions' strategies include both attempts to govern the processes of change as they impact work organisation, as well as efforts to help workers adapt to the changes.

Bargaining in the electricity sector presents some important differences with regard to the public administration and hospital sector. First, bargaining within the electricity sector occurs following the rules and customs of private sector bargaining. Here the company-level agreement with Enel, the largest employer in the sector, is negotiated first and sets the tone for negotiating the sector-wide agreement. Regarding digitalisation, electricity sector unions' strategies have focused on several areas: 1.) guaranteeing access to continuous training, 2.) job classification, 3.) regulation of remote work and the right to disconnect, 4.) using the rights to information and consultation to govern changes in work organisation, 5.) bargaining that is inclusive of the entire value chain (including new renewable start-ups) and not just traditional actors.

Unions in the public administration and hospital sectors have used both bargaining and information and consultation to address the changes wrought by digitalisation. To address changes in work organisation (outside of the purview of collective bargaining), the 2016-2018 CBAs for the public administration and hospital sector required the creation of bi-lateral standing committees on innovation, which use information and consultation to monitor changes that impact work organisation, and have the ability to propose changes themselves. In 2022, landmark CBAs were negotiated, covering 2019 – 2021, which include establishing the right to remote and agile work for all public employees, along with rules for governing the (decentralised) implementation of remote and agile work arrangements on an individual level.

Recommendations to national and European stakeholders

The nature of the changes being wrought by digitalisation are both profound and sweeping. And because the social, political and economic context within which new technologies are developed and implemented has an impact on the balance of power within the workplace and society, who benefits from digitalisation is contested terrain. This reality, the non-neutrality of technology,

opens up possibilities of increased conflict in industrial relations, as well as increasing collaboration.

Ensuring that the benefits of new technology accrue evenly across society, and include especially workers, will require new levels of awareness and understanding of digitalisation, new skills, approaches to bargaining that include the entire value chain, and joint governance of change, including at the level of the workplace.

SECTION 1. INTRODUCTION

1.1 Purpose of the research

In recent years, public service workers are increasingly using connected organising tools and methods that shape the way their job tasks are implemented, scheduled and monitored. In this context, the Digiqu@lpub project aims at: *(i)* Assessing the impact of digitalisation on job quality dimensions from the perspective of trade unions but also of public service workers themselves; *(ii)* Investigating how the challenges and opportunities for job quality generated by the digitalisation of work in public services are addressed in social dialogue (at national and sectoral levels) in selected EU Member States.

At the core of the project are eight case studies in as many countries: Denmark, Finland, France, Germany, Hungary, Italy, Poland and Spain. This report contains the Italian case study.

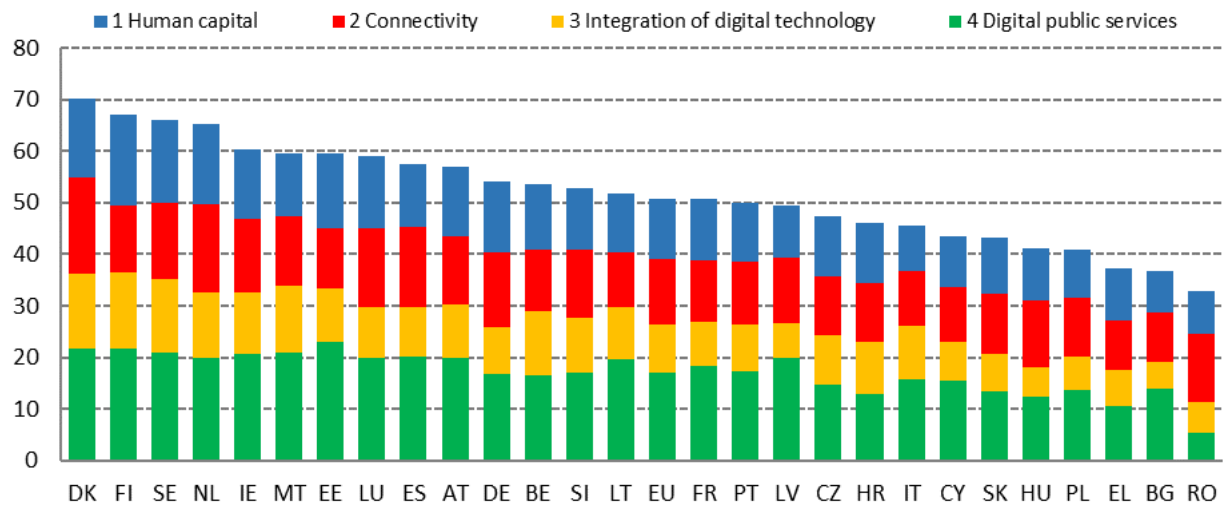
Three sources of data are used to address the research question: interviews conducted with trade unionists and workers; focus groups among field workers; data from an original web survey.

This report analyses the impact of digitalisation on job quality and social dialogue in Italy. Like the other case studies, the research focuses on three public service sectors: electricity suppliers, the public administration and hospitals.

1.2 Digitalisation: state of play and national strategies

1.2.1 Latest DESI Index

Italy ranks 20th out of 27 EU Member States in the 2021 edition of DESI, so reporting a very poor performance. Overall Italy is below the EU average, but extremely low in the dimensions of human capital and connectivity, while it is in line with the EU average in integration of digital technologies and digital public services. However, its ranking has been improving, in particular in 2020 and 2021.

Graph 1. Digital Economy and Society Index (DESI) ranking for EU countries (2021 edition)

Source: European Commission (2021).

1.2.2 National digital strategy?

The beginning of a national digital strategy in Italy can be detected with the launch in 2016 of the Government's Industry Plan 4.0 (Battista et al. 2022). This Plan, very much focussed on the manufacturing sector, aimed at reaching five main objectives: increasing the flexibility of small batch production with the economies of scale of mass production; reducing the time taken from prototyping to mass production using innovative technologies; increasing productivity thanks to lower setting-up time and reduced downtimes; improving quality and scrap reduction thanks to real time production monitoring through advanced sensors and; enhancing product competitiveness thanks to additional functionalities enabled by the Internet Of Things (IoT). The Government Plan was guided by three core principles: a logic of technological neutrality (assuming thus that technological change and digitalisation do not modify social structures and the distribution of resources and power across society); horizontal (and not sectoral/vertical) actions, thus providing help without being too invasive; and operating on enabling factors. The strategic framework was based on the idea of encouraging innovative investments with direct economic measures, and sought to develop enabling infrastructure, such as the implementation of ultra-broadband connections and standards and criteria for IoT interoperability.

In 2017 the Industry 4.0 Plan was renamed 'Enterprise 4.0', with the objective of expanding the scope of fiscal measures beyond manufacturing to also cover service sectors: the main novelties were a tax-credit for training of workers on Industry 4.0 technologies, granted only to companies on the basis of a company-level or local collective agreement, and a voucher for Small and Medium Enterprises (SMEs), to be used for consultancy services on digital transition.

In the 2020 budget law, the Italian Government renewed the former 'Industry 4.0' Plan (2016) and launched the new 'Transition 4.0' plan, with a stronger focus on innovation, green policies and

investment and involvement of SMEs. In fact, with the 'Industry 4.0' Plan, the internal demand for machine tools increased radically in 2017 (+46%) but declined significantly in 2018 (-11.5%) and 2019 (-25.7%).

In 2020, the Ministry of Technological Innovation and Digitalisation launched a public consultation on a document entitled '2025: a strategy for technological innovation and digitalisation of the country' that proposes 20 actions aimed at enhancing digitalisation, innovation and sustainable and ethical development of society ⁽¹⁾. The document was divided into four thematic areas: education and life-long learning, active labour force, specialised competences in information and communication technologies ⁽²⁾ and citizens and consultation. The consultation ran from 13 October 2020 until 30 October 2020 and received a total of 31 proposals, which made it possible to develop a clearer and more integrated strategy. In particular, with regard to the area of active labour force in the public sector, it was stated that the spread of digital culture at all levels of the public administration is seen as an essential element to foster digital transformation, together with the effective adoption of smart working. In the follow-up to the consultation it was also specified that the initiatives highlighted in the strategy aim, overall, to promote technological and innovation knowledge within the Public Administration (PA) through the recruitment of new resources with adequate digital skills and the up-skilling of those who already work in the PA, proposing differentiated solutions and tools in response to the specific needs of each key target: IT specialists and digital transition managers, public executives and all personnel primarily in charge of such administrative functions. In particular, in addition to the measures concerning recruitment of skilled workers, great attention is paid to the promotion of targeted and adapted training courses, with methodologies and tools tailored to the particular stage of the workers' career (e.g. new hires), the role or activity performed, and with extensive use of e-learning to ensure training that can be easily used at any time and in any place. In addition, consideration is given to the creation of mechanisms aimed at sharing and transferring knowledge within and between administrations and the world of innovation and research.

In the last two years the Italian Government has launched the National Innovation Fund. This uses venture capital instruments ⁽³⁾ to support investment in innovative enterprises (i.e. start-ups, scale-ups) and has developed two national strategies on Artificial Intelligence (AI) - the Ministry of Economic Development has launched a public consultation on AI ⁽⁴⁾ - and technologies based on blockchain, bringing together experts from industry, universities and social partners.

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1. <https://assets.innovazione.gov.it/1610546390-midbook2025.pdf>
 2. https://partecipa.gov.it/uploads/decidim/attachment/file/11/Report_intermedio_competenzedigitali.pdf
 3. Venture capital instruments are institutional investments in risk capital of unlisted companies, in the start-up phase, characterised by a high development potential.
 4. Ministero dello Sviluppo Economico (2019), https://www.mise.gov.it/images/stories/documenti/Strategia_Nazionale_AI_2020.pdf

The most recent government initiative consists of the National Recovery and Resilience Plan. The current national government (Draghi Government, 2021) has submitted its National Recovery and Resilience Plan (NRRP) to the European Commission as part of Next Generation EU: digitalisation is one the main pillars and one of the main missions of the national plan.

The NRRP is made up of six different missions consisting of 16 components and about 50 lines of intervention. The six different NRRP missions absorb different shares of the total European funding (about €191 billion, only counting the Recovery and Resilience Fund). The missions dedicated to the green transition and to digitalisation receive 31% and 21% respectively, totalling more than 50% of the Recovery and Resilience Fund resources available. A significant part of the EU funding is allocated to investments in Industry 4.0 technologies. Out of the about €40 billion devoted to digitalisation, about €14 billion are investments in Transition 4.0, about €7 billion in culture and tourism 4.0 and about €10 billion in digitalising the public administration. The investments in Transition 4.0 amount to about €19 billion, if we include the other EU funds. The explicit objective here is to relaunch the competitiveness and productivity of the country as a system. The general framework of the NRRP re-proposes the objective of the last national 'Transition 4.0' Plan, in which the government considers the transition from a twofold perspective: technological and ecological transition. In addition to the former 'Transition 4.0' Plan, the new NRRP specifies that digital investment in economic activities in Southern Italy should be increased, extending the tax credits for a two-year period (2021-2022) for those companies investing in material and immaterial goods, research & development, innovation and training in digital competences.

Along with investments explicitly focused on Transition 4.0, the components of the NRRP digitalisation mission also include investments in digital infrastructure and the internationalization of value chains. Some critics (Garibaldo, 2021) point out that behind the concept of Transition 4.0 as viewed within the Italian NRRP, certain ideas of digitalisation seem to prevail. First of all, digitalisation is viewed as a tool to redesign the production system, moving it towards more extreme flexibilization combining the advantages of mass production and mass customization; secondly, digitalisation is to be used to install more intensive and extensive forms of management command and control along the value chain (platform economy); and lastly, digitalisation will be used to integrate physical products and digital services (smart products). If we look at how the concept of digitalisation has been developed within the NRRP, say the critics, a social vision, a labour point of view seems to be missing.

In general, the NRRP is based on an idea of investment policy in line with the previous national investment plans on innovation, automation and technology. First of all, there is no clear and systemic industrial policy from the national government (Pianta, 2021): what is missing in the National Plan is the idea of a plan (Dorigatti and Rinaldini, 2021). The 'Transition 4.0' included in the NRRP is based on generic and indiscriminate incentives to companies (the so-called horizontal

policies as opposed to vertical policies) and does not provide any form of obligation (in terms of results, outputs or processes to be adopted) or accountability for those companies that benefit from fiscal measures. Little importance is attached to the social impact of digital technologies, even though many studies have already emphasized how digitalisation exerts asymmetric pressure on workers in terms of working conditions and quality of work. It is true that the NRRP devotes significant financial resources to training measures oriented to upskilling and enhancing workers' (digital) competences, but these measures seem to be more adaptive and still depend on supply-side investment policies more focused on encouraging workers' employability than on increasing employment. Finally, analysis of the NRRP reveals a deterministic approach to digitalisation based on the concept of neutrality of (digital) technology: public investments should not interfere with the technological innovation strategies of private companies but should only support and encourage these strategies.

With regard to the public administration, the measures in the NRRP could generate significant transformation in a system that is still very old-fashioned and that, with the exception of a small number of subsectors, has received limited innovation. As is illustrated in the literature (Arpia et al. 2016), the available evidence indicates that the development of digitalised processes in Italy is still unsatisfactory, with a preponderant share of citizens and significant share of businesses usually interacting with the PA in person. Especially in the case of citizens, there is low demand for on-line services, linked to a poor digital culture and a low propensity to use the internet. For companies, digitalisation of PA appears to be slow and to generate further delays in the exchanges between them and the public sector: companies, especially larger ones, show relative 'digital maturity' compared to the EU average and appear more prepared overall and receptive to the innovations offered by present and effective e-government.

Furthermore, the use of ICTs by the Italian public administration seems to be mainly focused on attempts to improve the efficiency of internal processes and much less on computerisation of the provision of services to citizens and businesses. Even when this has happened, the public administration has still not invested sufficiently in communicating the new features to users, thereby inhibiting the potential advantages of digitalisation. Not even the use of ICT tools in the internal management functions of the PA seems to have produced significant progress in the functioning of the public administration system, which continues to be the subject of repeated attempts at reform. A further feature of the digitalisation process is that it has taken place in different ways and at different speeds, producing an arrangement that could be defined as 'patchy'. Some entities of the central administrations - the Ministry of Economy and Finance, the Revenue Agency, National Social Security Institute (INPS) - are now equipped with advanced information systems and databases that allow citizens advanced interview methods and can carry out complex functions, as in the case of tax or social security obligations. For other ministries and, in particular, in the sector of the decentralised offices, the process has instead varied significantly.

These entities differ greatly in terms of functions and administrative dimensions; in particular, for the local authorities (Regions, Provinces and Municipalities) the differentiation inevitably reflects the variation in the socio-economic contexts between the geographical areas of the country.

Therefore, digitalisation of the Public Administration is one of the main challenges identified in the NRRP, with €6 billion allocated to investment in this area ⁽⁵⁾. A significant portion of these resources is specifically allocated for interventions aimed at transforming the public administration into a digital key. These interventions are contained in the first component of Mission 1: 'Digitalisation, innovation and security in the Public Administration'. The most important interventions concern digital infrastructure, in particular cloud technologies, data storage and protection, interoperability, with a view to ensuring better sharing of information between central and local public administrations, in compliance with the *once only* principle, according to which a public body should avoid asking citizens for information already possessed by other administrations. Great importance is also attached to digital services and digital citizenship and the overall improvement of the quality of digital services offered to citizens. This is linked to the initiatives launched in recent years to develop tools for the generation and dissemination of digital services. There are also measures that aim to improve the experience of users of the public administration's online services, by harmonising portal and service development practices and adopting common quality standards.

The investments described so far are mainly cross-cutting in nature: they concern all categories of public administrative bodies, central and local, albeit with numerical differences in terms of reference perimeter. Alongside these actions, the measure 'Digitalisation of large central administrations', on the other hand, identifies a series of 'vertical' interventions, aimed at large bodies in the Italian public landscape responsible for important processes in specific policy sectors (justice, labour, defence, public safety). As highlighted by the NRRP, these large administrations in fact play a fundamental role in the provision of public services widely used by citizens and businesses, and need considerable acceleration of modernisation and digitalisation. This investment consists of a total of €611.2 million, aimed at a rather limited audience of large central bodies:

- Ministry of the Interior: in particular, it is planned to digitalise the main services for citizens and the related internal processes: a total of 45 internal procedures and processes should be re-engineered and fully usable online by June 2026. In addition, new applications and internal management systems will be developed, as well as staff retraining interventions to strengthen the digital capabilities of the administration.

5. <https://www.forumpa.it/pa-digitale/pnrr-e-trasformazione-digitale-ecco-gli-investimenti-e-le-riforme-previste-per-la-digitalizzazione-della-pa/>

- Ministry of Justice: a massive digitalisation effort is expected, with the digitisation of 10 years of Court archives relating to civil and criminal trials, amounting to a total of 10 million digitised judicial files by June 2026. On the same date, a data lake will be completed, to act as a single point of access to the raw data produced by the judicial system, together with 6 new knowledge systems related to it.
- Social security institutions, namely INPS and INAIL (National Insurance Institute for work accidents): mainly plans to revise internal systems and procedures, as well as the development of digital contact points with users. Regarding INPS, it is expected, by December 2023, that 70 additional services will be made available on the institutional website and a total of 8,500 employees will acquire improved digital skills. For INAIL, the re-engineering of 82 institutional processes and services is expected by June 2026 to make them completely digitalised.
- Ministry of Defence: an upgrade of systems and applications is expected, together with a gradual transition towards open-source paradigms. The resources allocated to the Ministry of Defence amount to €42.5 million. In particular, by December 2024, 20 procedures relating to personnel management should have been digitalised, revised and automated; a number of certificates should have been issued using the infrastructure, with a disaster recovery site equal to 750,000; 15 applications (4 non-mission critical, 11 mission critical) should have fully migrated to a new open-source infrastructure.

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

1.3.1 Quantitative impact of digitalisation on employment

According to the literature review by Freddi (2017), over the last few years there has been growing interest in both the academic and policy arena, at global and European levels, in the socio-economic consequences of the full absorption and exploitation of digital technologies. A number of studies have been produced, mainly attempting to estimate the number of jobs that might be displaced due to the possibility of substituting human labour with machines (Frey and Osborne, 2013; World Economic Forum, 2016).

These and other similar studies forecasted that about 30-40% of jobs in advanced economies will be at risk by 2035. According to some scholars (Valenduc and Vendramin, 2016), these studies are based on the assumptions that there is a 'direct cause-and-effect relationship between emerging technological innovations on the one hand (in particular learning machines and mobile robotics) and the anticipated productivity gains to be made by using robots as substitute for human labour on the other (based on the likelihood of this substitution occurring for the individual tasks within a job)' (p.16). However, as these authors explain, there are arguments denying the existence of a

causal link between technological innovation and increased productivity, which can also be used to explain the Solow paradox, when the American economist in 1987 pointed out that: 'you can see the computer age everywhere but in productivity statistics'.

One of the key problems with these studies is that they are based mainly on macro analyses while the novelty and pervasiveness of digital technologies require more in-depth micro-level analysis. Moreover, it should be borne in mind that, before digitalisation, the relationship between technical change, innovation and employment has been studied by many economists for a long time.

The quantitative impact of innovation on employment, usually measured in terms of number of jobs or number of hours worked, has been studied at three different levels: at the firm, industry and macroeconomic level.

Many studies, firstly, have been conducted at company level, mainly making use of panel data from a number of, often manufacturing, sectors at national level (for reviews see Petit, 1995; Chennels and van Reenen, 1999; Spiezia and Vivarelli, 2002). Overall, these studies show positive effects of innovation on employment, as firms that introduce product, process and organisational innovations tend to be more competitive, more productive, expand their markets and therefore grow faster, with positive implications for the number of jobs. The weakness of these studies is that they show what happens to the groups of firms analysed, but they say nothing about the economy as a whole. In other words, if the growth of the innovative firms is at the expense of competitors, the overall effect on the system may be negative.

Since firm-level studies do not always apply more widely, scholars have focused on the effects at industry level, which take into consideration both the direct consequences at firm level, as in the studies mentioned before, and the indirect effects that may arise within the industry.

The industry level is considered by scholars who study it as the 'most satisfactory level of analysis, as it is able, on the one hand, to differentiate between the variety of technological regimes and strategies and, on the other hand, to bring in the demand dynamics of specific sectors, taking into account country differences in economic structures' (Pianta, 2005, p.579). Most of the empirical studies show that product and process innovation have opposite employment effects: product innovation, particularly if developed in contexts of high demand growth, has positive effects, whereas process innovation, often adopted to increase productivity and reduce labour costs, leads to job losses. These results are based on analysis of both manufacturing and services. The sector-level analysis provides a different picture to that provided by firm-level analysis, in particular in the case of studies on Europe. Empirical evidence shows that product innovation has had a positive impact on employment, but at the same time, the constrained demand due to the slow economic

growth since the 1990s and the increase in international competition has led companies to apply labour-cost-saving strategies, thus enhancing process innovations and restructuring.

Macroeconomic studies take into consideration a larger number of indirect effects that act in the whole economic system and can lead to different results from those outlined above. In particular, scholars studying the employment effects of innovation have focused on process innovation, which is often labour-saving thus leading to an increase in unemployment (Vivarelli, 1995; Simonetti et al., 2000). Overall, the 'findings of these studies point to a differentiated impact of innovation depending on countries' macroeconomic conditions and institutional factors. The employment impacts of innovation generally are more positive in economies in which new-product generation and investment in new economic activities are higher, and in which the demand-increasing effects of price reductions are greater.' (Pianta, 2005: 582).

Finally, the relationship between innovation and employment has also been examined by means of simulation studies (Leontief and Duchin, 1986; Whitley and Wilson, 1982; IPTS-ESTO, 2001). According to the work done by Leontief and Duchin (1986: 12): 'the intensive use of automation will make it possible to achieve over the next 20 years significant economies in labor relative to the production of the same bills of goods with the mix of technologies currently in use. Over 11 million fewer workers are required in 1990, and over 20 million fewer in 2000 [...], this represents a saving of 8.5 and 11.7%, respectively, of the reference scenario labor requirements.' Differently, Whitley and Wilson (1982) tried to quantify some compensatory effects on employment that could offset displacement effects brought about by technological change, showing that both job losses and gains were possible, depending on the assumptions made concerning the speed of diffusion and users' demand for microelectronics.

According to Pianta (2005: 583), trying to summarize the literature considered so far: 'both sectoral and aggregate studies generally point out the possibility of technological unemployment, which emerges when industries or countries see the prevalence of process innovations in contexts of weak demand. Firms innovating in both products and processes may be successful in expanding output and jobs regardless of the economic context, but often do so at the expense of non-innovating firms. The specificities of industries, countries, and macroeconomic conditions are crucial determinants of the results obtained in empirical studies.' Finally, it should be noted that the studies examined above all referred to the national economy and did not address the relationship between employment and innovation from a global perspective, which could lead to new and different results.

In addition to these analyses, focussing on the relationship between technological change, innovation and employment, more recent research has specifically addressed the impact of digitalisation (Lovergine, 2019). According to the European House - Ambrosetti (2017), 14.9% of

all employees, 3.2 million people, could lose their jobs over a 15-year time horizon due to the application of robotics and digital technologies.

The differences between sectors stem from the differing composition of the workforce: employees in the education and health sector (doctors, nurses, etc.) carry out complex tasks, cannot easily be replaced, and their job involves a high component of personal interaction compared to those employed in the manufacturing industry (workers, technicians, etc.). Educational qualifications are another determinant variable for reducing the risk of automation replacing one's job. Workers who hold a diploma in fine arts or a conservatory diploma (approx. 242,600 people) have the lowest risk of replacement (about 5% are at risk of replacement). This indicates the assumed importance of creative abilities in determining lower substitutability, compared to subjects without a qualification (approximately 106,900) exposed to a greater risk of being replaced (about 21%).

High risk percentages (18%) are recorded among subjects with a middle school diploma (8.5 million), and with a high school diploma (6 million of workers, 16% at risk of replacement). Workers with a university degree are at lowest risk (1%) of their job being replaced by automation; at the opposite end of the scale are 17 million of less qualified, non-graduate workers (17% at risk). Certain variables make it possible to draw a fairly accurate profile of characteristics that determine a lower risk of replacement for an occupation: non-repetitiveness of the work performed, creative and innovative skills required to carry out the duties, intellectual and operational complexity of the activities carried out, relational and social skills such as empathy, persuasion and negotiation skills.

However, new technologies are also creating new professions. In fact, the demand in companies, public administrations and the third sector for people to fill new jobs stems from aspects related to the innovation of processes, products and strategies from a digital perspective, which will profoundly change the way of working. Phenomena such as smart working and other flexible and dynamic models of work organisation will be even more widespread in the future, thanks to profound changes in the business models of companies (Industry 4.0, gig economy, etc.).

A survey on online job vacancies conducted by Tabulaex ⁽⁶⁾ identified 13 emerging professional profiles, highlighting that some professions will tend to disappear, or will be entrusted to robots. According to a study conducted by the main Italian business newspaper 'Il sole 24 ore', on the other hand, 11 particularly representative professional profiles have emerged in the last five years, linked to the pillars of the new production model and useful for strategically governing the changes imposed by big data, the cloud, mobile, social, IoT and Security ⁽⁷⁾.

6. Tabulaex, a spin-off of the University of Milano-Bicocca, has launched the business intelligence platform Wollybi which includes a Labor Market Observatory built on the analysis of online job advertisements.

7. <https://www.ilssole24ore.com/art/anche-2022-digitale-vince-sfida-profili-piu-richiesti-classifica-AEskExBB>

1.3.2 Qualitative impact of digitalisation on employment

1.3.2.1 Work organisation in digitalised processes

According to Eurofound (2018), the increased efficiency of digitalised process management and control is likely to be associated with labour-saving productivity growth, especially in areas such as logistics, quality control and administration. 'Digitalisation facilitates the algorithmic automation of many of those tasks although the distinction between automation and labour-saving productivity growth is somewhat artificial. Another crucial effect of digitalisation, in terms of the division of labour, is the increasing irrelevance of the physical location of labour input in the production process; this could contribute to a further and perhaps final round of globalisation' Eurofound (2018: 18). With regard to the link between digitalisation and globalised processes, Richard Baldwin (2016) argued that telepresence (virtual reality technology) and virtual and augmented reality can facilitate the delivery of face-to-face services from any distance, thus breaking the final boundary that has protected many service activities (and jobs) from globalisation.

At the same time, the digitalisation of economic processes raises some serious concerns regarding the autonomy and privacy of workers. Several studies in different sectors (UniGlobal, 2021; Moro and Rinaldini, 2020; Fontana and Solinas 2020) show that if every single object in the workplace is a sensor that feeds real-time information to a centralised management algorithm, workers may legitimately feel that their autonomy and privacy are being compromised. The other side of the equation is that improved intelligence and information on work processes can reduce accidents, and dispense with the need for certain isolated, repetitive tasks. These studies also show how in general terms digitalisation tends to reduce workers' autonomy and increase work intensity, as they increasingly have to follow instructions from machines.

Eurofound (2018:19) also suggests that 'digitalisation makes possible more complex organisational forms of production; it may facilitate the breakdown and subcontracting of an increasing number of tasks, even in traditional production processes. Subcontracting and outsourcing, even crowdsourcing, can result in less favourable conditions of employment for workers in terms of stability, income and working hours. By blurring company boundaries and disrupting union solidarity, such forms of work can also make collective representation more difficult.'

1.3.2.2 Skills and learning

A large branch of labour economics literature has focused on studying the qualitative, rather than quantitative, effects of innovation on employment. The interest shown in this issue was partly due to the fact that economists adopting the equilibrium perspective did not recognise the existence of technological unemployment, so instead looked for changes in the characteristics of labour markets. In particular, a large number of studies produced in the US have pointed out that the technological evolution which has occurred since the 1970s has favoured the growth of skilled workers who have replaced unskilled labour, thus eventually increasing wage inequality.

Some of the key contributions of the so-called skill-biased-technical-change (SBTC) literature, reviewed in Acemoglu (2002), are from Krueger (1993), who published an influential paper titled 'How computers have changed the wage structures', and Greenwood and Yorukoglu (1997: 87) who stated that: 'setting up, and operating, new technologies often involve acquiring and processing information. Skill facilitates this adoption process. Therefore, times of rapid technological change advancement should be associated with a rise in the return to skill.'

In his review of this branch of literature, Acemoglu points out that the broad consensus on the bias of technical change towards skilled labour, further supported by the technological changes brought about by ICTs, is indeed a 20th century phenomenon. In the 19th century, the innovation contained in factories and production lines replaced skilled artisans, showing an unskilled bias. 'The experience of the nineteenth and early twentieth century led [...] to argue that technical change was "deskilling" – a major purpose of technical change was to expand the division of labour and simplify tasks previously performed by artisans by breaking them into smaller, less skill-requiring pieces' (Acemoglu, 2002: 9). What are the determinants of the different trends in these two centuries? According to this author, the early nineteenth century was characterised by skill-replacing developments because the increased supply of unskilled workers in the English cities made the introduction of these technologies profitable. However, 'the twentieth century was characterized by SBTC because the rapid increase in the supply of skilled workers has induced the development of skill-complementary technologies.' (ibid.: 64) In these contributions, there is a sort of complementarity between technological and skill change, where it is not only the supply of skills that influences technical change, but also the other way around. Acemoglu and Autor (2011: 1044) highlight that: 'the starting point [...] is the observation that the return to skills, for example as measured by the relative wages of college graduate workers to high school graduates, has shown a tendency to increase over multiple decades despite the large secular increase in the relative supply of college educated workers. This suggests that concurrent with the increase in the supply of skills, there has been an increase in the (relative) demand for skills.' The same authors, on the basis of Tinbergen's work (1974,1975), suggest that the relative demand for skills is linked to technology, and in particular to the skills bias of technical change.

In his review of the literature on the issue, Pianta (2005) illustrates that one stream of work (Bekman, Bound and Machin, 1998) compares the effect of technology with that of increased international trade, finding that technology accounted for the largest part of the reduction in less-skilled workers, while another stream (Doms, Dunne and Troske, 1997) showed that new technologies are adopted extensively in plants with more skilled workers, but do not increase the demand for skills. However, he also points out that 'when more refined measures of skill are used, the evidence of skill-bias is less clear'(ibid.: 584).

Radically different conclusions from the SBTC perspective are reached by Howell (1996), who denies the link between computerisation, upskilling and wage inequality, showing that the skill structure in the US changed significantly between 1973 and 1983 but little change took place later, when ICT started to become widespread.

Finally, studies have investigated not only the impact of technological innovation on skills, but also the impact of organisational innovation. A large number of studies on European countries have shown that organisational innovation is often more important than technological development in modifying companies' structures and the associated skills (Caroli and van Reenen, 2001; Greenan and Guellec, 2000; Piva and Vivarelli, 2002). Moreover, Antonioli et al. (2011) show that stronger economic performances are achieved by companies that adopt more than one type of innovation at the same time. These authors illustrate that the simultaneous adoption of different types of innovation, often process and organisational, can boost companies' economic performance, as they tend to complement each other.

Overall, the large branch of literature studying the relationship between technological innovation and change in skills and wages has highlighted the relationship between these factors. However, this literature has some key weak points due to the absence of a macroeconomic perspective. In particular, these analyses should be integrated, considering not only a narrow labour market perspective but also the socio-economic context in which the changes analysed are taking place.

1.3.2.3 Reconciliation of work and personal life, particularly in the case of teleworking

According to OSE and EPSU (2018), digitalisation makes workers reachable during a much larger time slot (and more outside 'regular' working hours) because of greater flexibility in working time and/or increasing workload or task complexity. This can entail disconnection issues and blurring of the frontier between personal and professional life, a feeling of isolation (some personal relationships are replaced by virtual contacts), and increasing difficulty to achieve a good work-life balance, due in part to work pressure but also driven by the 'fear of missing out' syndrome. These aspects became particularly evident with the massive increase in teleworking as a result of the outbreak of the Covid-19 pandemic.

According to Sosterio et al. (2020), the data from the Living, Working and Covid-19 survey show that blurred boundaries between work and home life are one potential negative effect of working from home. This downside of homeworking was certainly experienced at the beginning of the pandemic, but it was already acknowledged before. According to the survey (Sosterio et al., 2020: 22), 'nearly a half of those teleworking (48%) reported in April 2020 working in their free time to meet work demands regularly (at least once or twice a week), over twice the share of those not teleworking (23%). This already marked differential increased in the second round of the survey in June/July 2020 (47% v 17%). At the same time, employees working from home during the

pandemic were much more likely to have put in longer unpaid domestic work hours (caring and household work) than those not working at home, notably for those with school-age children. School closures appear the most plausible factor influencing these patterns and these differentials.’ However, the second round of the survey, conducted between June and July 2020, showed that overall the experience of working from home during the Covid-19 crisis was positive for the majority of employees who did so. In particular, people were satisfied with the quality of their work (77%), with the amount of work performed (69%) and with the overall experience (70%). Considering these results, it is not surprising to read in the survey data that the large majority (78%) of ‘pandemic’ teleworkers would like to work from home at least from time to time after Covid-19 restrictions are lifted. However, the possibility to continue to work at the workplace and thus mix teleworking and working at the workplace is important, as only 13% say that they would like to work only remotely.

Personal experience of teleworking is one of the factors that influence attitudes towards this form of work. Employees who worked from home during the pandemic were much more likely to say they wished to continue afterwards, and the longer the period they teleworked, the greater their wish to carry on doing so. At the same time, approximately half (45%) of those who did not telework at all during the Covid-19 crisis say that they would never work from home.

A research report by Eurofound and ILO, published before the pandemic (2017), reviewed the existing literature at that time on the characteristics of teleworking, considering both home working and ICT based working. The studies collected and analysed help us to understand the positive and negative effects of teleworking, thus impacting its desirability. The studies tackle the following four issues:

- Working time, including working hours and working time organisation,
- Individual and organisational performance,
- Work-life balance,
- Occupational health and well-being.

With regard to the first issue, the working hours of teleworkers tend to be longer than for those employees who always work at the employer’s premises. Teleworkers are also more likely to work in the evenings and at weekends than workers who always work in the office, although they are less likely to work at night. Teleworking seems also to have an impact on the organisation of working time: ‘The spatial flexibility of performing work-related tasks irrespective of location allows for an alteration of regular work schedules, including performing work outside of regular business hours’ (Eurofound and ILO, 2017: 23). Finally, in those countries where the information is available, teleworking is associated with employee-oriented time flexibility, i.e. a certain degree of autonomy in choosing how to organise and perform their work.

Working time flexibility, the ability to better concentrate and the lack of interruptions led to higher individual performance and fostered innovative behaviours and productivity. These positive results may encounter a number of limiting factors, in particular in those cases where the use of ICT is problematic for teleworkers and in organisations where there is a high level of control over workers' performance.

Work-life balance is improved by teleworking, mainly because of the reduction in commuting time and the worker's ability to organise his or her own working schedule. However, this positive characteristic also brings some risks with it, as there might be a certain degree of work-home interference that blurs the boundaries between home life and work, a risk that is higher for women. As there is a degree of ambiguity in the results on the relationship between work-life balance and teleworking, researchers started to analyse how and not whether telework might improve the work-life balance: a key element seemed to be an optimal individual strategy for 'work-life management' or 'boundary-management'.

Finally, telework seems to involve several potential negative effects and risks regarding 'occupational health and well-being'. The studies analysed in the Eurofound-ILO report (2017) point out that teleworking can lead to an increase of work-intensity, the risk that insufficient attention will be paid to ergonomics, more time spent on visual display units and risks of social isolation.

Both the positive and negative effects of teleworking acknowledged before the pandemic could also be experienced in the pandemic, although the availability of data on the pandemic period is very limited at the moment. The wave of the survey 'Living, working and Covid-19' conducted by Eurofound in April 2021 (Eurofound 2021) confirmed difficulties in setting boundaries between work and home life, especially at the time when schools and in general care services were at least partially closed, and a reduction in mental well-being due to social isolation.

The work conducted by Fana and colleagues (2021) suggests that teleworking conducted since the pandemic does not in itself affect the content of tasks (what people do) but mostly how they perform their tasks (how people do what they do). The study also supported the argument that the need for direct control - which is not feasible outside the firms' premises - tends to mutate into new forms of remote control, which can be in the long run equally pervasive. However, workers' autonomy and the possibility to resist mechanisms of close remote control were strongly related to the levels of autonomy enjoyed prior to the shift to remote work. In terms of mental well-being and subjective perceptions, mid and low-skilled workers, and more generally those working in close contact with clients, often felt more satisfied working from home than in the regular office. However, in general the study shows a negative impact on social relationships. Finally, with respect to the effects of telework during the COVID-19 crisis on work-life balance, they were strongly conditioned by the household composition. As could be expected, workers with children, especially in school age, appear to be less satisfied with the new work arrangement.

SECTION 2. IMPACT OF DIGITALISATION ON JOB QUALITY

Section 2.1 Electricity production and distribution sector

2.1.1 Overview of the sector

The electricity production and distribution sector is going through significant changes in Italy. Currently there is an ongoing transition from a monopolistic public system to a liberalized market. Furthermore, the whole sector is introducing innovative processes in order to increase the use of energy sources with lower levels of CO2 emissions and to reduce the environmental impact. Overall, this is leading to the development of protocols and legislation to regulate the access to the market of new companies, as well as mergers and acquisitions.

The liberalisation process started in Europe and in Italy between the end of the '80s and the early '90s through the creation of the first organised electricity markets and has evolved at the European level with the 96/92 EC Regulation ⁽⁸⁾, aiming at providing the Member States of the Union with a series of common rules for the creation of a European energy market. At the beginning of 1991, a gradual liberalisation process also began for Italy.

The substantial liberalisation of the electricity sector in Italy has its roots in Legislative Decree 79/99 (the so-called Bersani Decree) which made the production, import, export, purchase and sale of electricity completely free, reserving the activities of transmission and dispatching for the State, and granting them in concession to a new joint stock company, the National Transmission Grid Operator (GRTN). The complete opening of the market dates back to 1 July 2007, on which date domestic customers were given the opportunity to freely choose their energy supplier.

According to a recent study on the sector, in 2019 the gas and electricity sectors together employed 88,000 employees, while the electricity sector alone employed about 50,000 workers (Mencarelli and Mereu, 2018). In the same year the overall industrial sector in Italy employed over 6 million people, so the gas and electricity sector represented 1.4% of the industrial workforce and 0.4% of the total workforce. The number of companies was 2,574 and the average size is much higher than the average in industry: the large majority (69.1%) of employees work in companies with more than 250 employees. These sectors can be defined as capital intensive, with a turnover of more than €168 billion, obtained with a small workforce. With almost €100,000 in investment per employee, the investment rate is almost 7 times higher than in the overall industrial sector. Considering these data, it is not surprising to see that almost half of the companies with more than 10 employees can be defined as innovative, from the product and/or process perspective. When it comes to digitalisation though, we can see that the process is still ongoing, as only 14% of the

8. <https://eur-lex.europa.eu/eli/dir/1996/92/oj>

companies have acquired goods and/or services with Internet-Of-Things technologies and only 18% have to date analysed large datasets. Looking at the distribution of employment in the sector across different regions within Italy, we see that more than 50% of total national employment is located in northern regions, in particular in Lombardy (16% of total employment of the sector), Emilia-Romagna (10%), Piemonte (9%) and Veneto (7%).

Table 1. Occupational structure of the gas and electricity sector (% , 2019)

		Gas and Electricity sector	Industry (excluding construction)
Company size	0-9	7.0	25.3
	10-49	10.3	30.3
	50-249	13.7	22.4
	Over 250	69.1	23.7
Gender	Male	80.7	72.9
	Female	19.3	27.1
Age	15-29 years old	10.1	11
	30-49 years old	45.1	56
	Over 50 years	44.9	33
Country of birth	Italy	96.6	87.9
	Other EU	1.3	3.1
	Outside EU	2.0	9.0
Occupational position	Employees	89.3	84.0
	Self-employed	7.6	12.2
	External	2.6	0.9
	Temporary	0.6	2.9
Professional qualification (employees)	Executive	1.9	1.2
	Manager	9.3	3.0
	White collar	50.3	27.8
	Blue collar	26.8	65.1
	Apprentice	5.0	2.6
	Other	6.7	0.4
Working time (employees)	Full time	95.5	88.4
	Part time	4.5	11.6
Contractual position (employees)	Temporary	2.8	6.1
	Open ended	97.2	93.9

Source: Mencarelli and Mereu (2021:18).

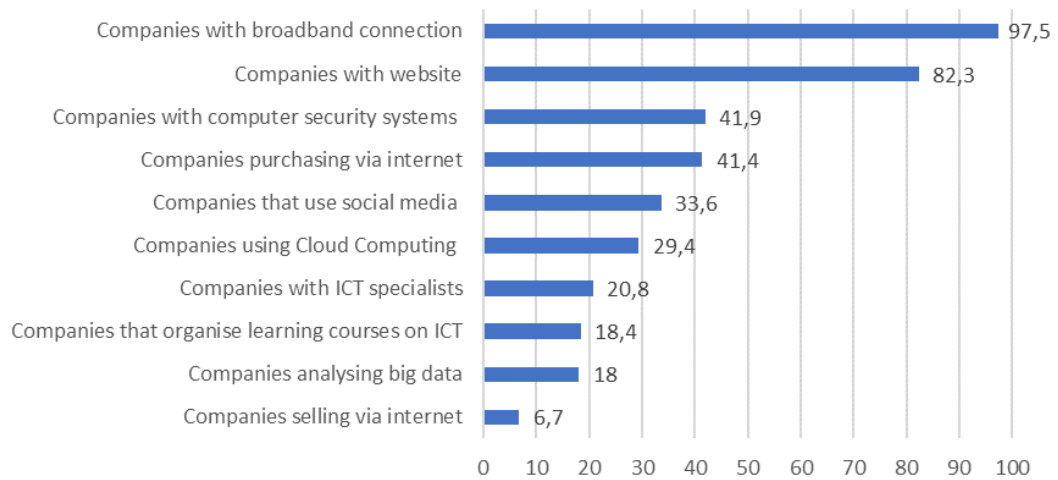
Table 1 clearly shows that employment in the gas and electricity sector is concentrated in larger companies (69.1% in companies with more than 250 employees). This sector thus stands out from the industrial sector in general, where only 23.7% of employment is in larger companies. The electricity sector also has a higher level of male employment (80.7%) than the industry average, and an average age that is slightly lower than the industry average. Again, compared to the entire industrial sector, employment in electricity is almost completely Italian and made up predominantly of employees with standard contracts (open ended, full time). Another distinguishing factor is the high levels of professional qualification of the workforce: the percentage of white-collar workers (50%) is much higher than in the overall industry (27.8%).

According to Mencarelli and Mereu (2021), the structure of companies in the electricity sector is very heterogeneous, with a small group of very large companies (1.4% of total enterprises) that employ a very large percentage of workers (70%). Beside this group there is a large number of small companies with less than 50 workers, which make up about 20% of employment and which mainly operate in the renewable energies sector. The level of internationalisation appears to be pretty high, as the employees that work in Italian companies located abroad are equivalent to 42% of the workforce operating in Italy in the same sector. Italian companies in the electricity sector are present not only in Europe but also in other areas of the globe, in particular in South America. At the national level the largest company is Enel (about 32,000 employees in Italy); other key players are Terna, Acea, Edison, EDF, A2A, Hera.

In order to address the history and patterns of digitalisation, as we do in the following Section, it is useful to consider some data related to the level of investment and innovation in the sector. As stated before, the gas and electricity sector is capital-intensive with a level of investment per employee which is almost 7 times higher than the average of the entire industrial sector. 54% of the investment is targeted at infrastructure for the production and distribution of different energy sources while 34% goes to the acquisition of new machines and instruments.

From a different perspective, almost 90% of the investments aim to enhance the productivity of the system, through the enlargement of plants and the renewal of the infrastructure, while only 10% of investments are in research and development activities, which are fundamental for innovation in the sector.

Graph 2. Use of ICT in companies with more than 10 employees in the gas and electricity sector (%)



Source: Mencarelli and Mereu (2021:16).

Finally, the above graph shows the percentage of companies with more than 10 employees which use different forms of ICT. While the share of companies with a broadband connection and a website is very high, the other possible uses of ICT are quite limited. In particular, only 18% of companies sell via the internet and only 18% analyse big data and organise learning courses on ICT.

2.1.2 History and patterns of digitalisation in the sector

According to the evidence collected through the interviews and the focus group, digitalisation in the Italian electricity sector has to date aimed at improving energy efficiency, productivity and the sustainability of the system. The most important technological developments in the sector are the so called 'Smart Grid', big data analytics, blockchain technologies to guarantee traceability along the value chain and IoT instruments for automated maintenance of networks. Big data analytics allow so-called 'predictive maintenance', as the analyses of previous interruptions in supply allow firms to foresee and locate possible new malfunctions.

However, while the implementation of digital processes in the Italian electricity sector has been widely publicised by companies, actual implementation stalled prior to the Covid-19 pandemic. The pandemic led to a fast and in-depth transformation process towards more widespread digitalisation. Currently the most significant changes brought about by digitalisation and with an impact on labour are: the electronic meter for measuring electric energy consumption in customers' premises, the so-called Workforce Management Programs adopted in some of the largest companies in the sector, such as Enel and A2A, the use of drones and smart glasses for maintenance activities, specific applications for smartphones and the extensive use of teleworking. In the coming years there will also be significant investment in the Smart Grid: in Enel in

particular, the aim of the programme 'Grid Blue Sky' is to create a smarter electricity network, increase efficiency and thus improve distribution. This may have a significant impact on working conditions in the coming years. As emerged in the focus group, external workers, who work 'in the field', mainly fixing problems with the electricity grids, do not use personal computers but handhelds. With this device it is possible to track all the interventions on the grid and make analyses of the work done. There is also a safety system which is called 'man down': if a worker puts the device down for more than 30 seconds, it sends an alarm to the central office.

Another device that is very much used by workers in the field is the smartphone. This is used for telephone calls but, more importantly, there are a large number of applications that workers are required to use, especially when working 'in the field'. By means of these applications workers can print out documents (with a portable printer), they can access relevant files remotely, and they can trace their work. Applications are also used to guide workers who are fixing a breakdown in the electrical system.

According to the DIGIQU@LPUB web survey (DGQS) ⁽⁹⁾, 97% of respondents regularly use mobile devices such as laptops, smartphones or tablets. These are used mainly to communicate with colleagues and internal or external services or to plan/schedule the performance of work tasks (both 26%). As emerged also from the focus group, the use of machines operated by digital commands to perform certain operations (for example, lifting heavy loads or persons, monitoring equipment or persons) is not very common: 78% of respondents do not use this kind of machines.

In the next sections we illustrate, from our interviews and the focus group, how the most relevant changes for workers brought about by digitalisation have impacted the different dimensions of work quality (work organisation, working time, health and safety, skill and learning, work-life balance, career prospects and employment security and workers' rights).

2.1.3 Work organisation

Electronic meters for measuring electric energy consumption in customers' premises replaced the mechanical version in the early 2000s. With the mechanical meters, workers had to periodically check customers' premises (houses or buildings) to measure consumption. Thanks to the electronic meter, this operation is no longer necessary, which has led to a reduction in the workforce required. In general terms the increasing capacity to monitor electric networks remotely due to the shift towards smart grids may lead to a reduction in the workforce required to work along the distribution lines.

9. Sample size for the sector: 463 respondents.

As described by our interviewees and participants in the focus group, Workforce Management Programs (WMPs) were developed for workers whose job is to maintain the electricity grid. They work in teams and need to intervene in case of malfunctions along the line. Before the introduction of WMPs, workers started their working days by visiting the office to receive the list of jobs, and then travelled to the different locations where they were needed. Nowadays, thanks to WMPs, they start their working day directly from home as the new devices show them a list of tasks to be carried out. Once they have finished these, they have to do some administrative tasks in order to 'conclude' the work procedure. This change has improved workers' life as they travel less, but also because they had to acquire new competences: they were formerly mainly operative workers but have now taken on certain administrative and managerial tasks. Workers have had to become progressively more multi-skilled.

The use of drones to make the inspections and evaluate the conditions of the grids has also broadened the range of skills needed in electricity companies, an issue addressed by the hiring of new personnel with specific competences and upskilling of existing workers.

The apps for tracking and guidance described in the previous section are regarded mainly negatively by workers. In particular, the monitoring/tracking activity is additional to their normal working tasks, since they are required to document constantly, by means of pictures, the work they have done. This makes work extremely long, as the monitoring activity takes time. Moreover, workers believe that their work has become more unsafe because often they have to work with one hand, sometimes also in dangerous positions, while taking pictures with the other.

Workers find the guidance apps useful because they explain the work to be done; however, they think that these tutorials reduce the competences of the workforce. By means of this application it is now possible for workers with little experience to perform their duties just following the instructions given by the app. According to the workers attending the focus group, this has allowed their company to reduce labour costs, as many tasks can be performed by external companies with a less experienced workforce, often belonging to sectors falling under different and less expensive national collective agreements.

Drones are judged very positively because they can help to detect problems on the grid in a safe way. They also require new competences and are perceived as a new technology that requires proper training and new skills. Smart glasses are used to collect pictures and documents for monitoring the work activity in real time in a different and more comfortable way. This helps when workers need further remote assistance from colleagues. They do not really improve or complicate the way of working, but have resulted in an economic advantage for the company because fewer workers are required to fix problems along the grid.

Therefore, digitalisation has allowed the company to rely more on digital tools such as smartphone applications to coordinate and guide the work to be performed. This has had two major consequences for workers in the field: the number of people in the team was reduced (from 4-5 to 2-3) and they have to monitor their work step by step. The combination of these two factors has resulted in an enormous increase in work intensity because *'the manual and technical work to be done is the same but now we have some additional tasks linked to the monitoring activity'*. (FG1) Also workers' autonomy has been significantly weakened because all workers, even the very experienced, are required to follow the instructions provided by the application to fix a problem on the grid. Therefore, autonomy has decreased in all aspects: in task scheduling, task organisation and problem solving. Following the instructions slows down work processes, so workers who need to meet the deadlines have to work without following the instructions, at their own risk. Cooperation among colleagues has not changed while monitoring by supervisors has increased, as all the work needs to be tracked and monitored step by step.

As a consequence of these aspects, job satisfaction has generally declined since the introduction of digital devices. However, workers involved in the Focus Group believe that although the quality of their job has deteriorated, the quality of the service provided is still good.

However, the results of DGQS tend to paint a different picture: the majority of respondents stated that digitalisation has improved their personal job quality (56%) as well as their autonomy in conducting their own tasks (60%).

Finally, with regard to teleworking, the Italian labour market and also the electricity sector have experienced a significant and sudden increase in the share of people working remotely. After the lockdown, the idea of permanently increasing the share of teleworkers gained steam. This happened also in the bigger companies in the electricity sector: for example, in Enel, the largest company in the sector, one of the unions (Filctem-CGIL) decided to launch a survey in June 2021 to evaluate the pros and cons of teleworking as experienced by workers, in order to formulate specific requests to the company on the issue ⁽¹⁰⁾. A total of 1,734 questionnaires were collected and analysed thus offering interesting insights on this specific issue. With regard to work organisation issues, it emerged that 38% often worked over the contractual working time when teleworking and 34% of workers responded that with teleworking they felt under pressure or monitored. However, the company appreciated the increase in productivity and the degree of autonomy thanks to teleworking, so they pushed to make it permanent. This opened up two major issues to be addressed by the unions: the need to find a way of measuring the increase in productivity brought about by teleworking and the need to find a solution for those workers who

10. https://www.filctemcgil.it/images/documenti/elettrico/210712_RISULTATI%20SURVEY%20NAZIONALE_ENEL.pdf

do not want to work permanently remotely. According to our interviews, companies that push for a radical adoption of teleworking may end up reducing office space, and this might lead to problems of isolation and further difficulties for workers who for various reasons cannot work properly from home. According to the DGQS, 64% of respondents work from home or telework at least 2 days a week, confirming that in the sector, in particular in the largest company in the sector, teleworking is a common practice.

2.1.4 Working time

As stated in the previous section, while WMPs and drones have not had an impact on working time, teleworking has, however, had some significant negative consequences. In particular, as stated before, one third of workers in the largest company in Italy said that they often worked over the contractual working time when teleworking. This might be one of the reasons why 34% of respondents (according to the survey by Filctem-CGIL) would not like to continue teleworking after the pandemic or, if they did, would like to correct some negative aspects.

According to the discussions in the focus group, work intensity has increased for field workers as the number of tasks have expanded, which often leads to a need for overtime (paid). For those workers located in central offices, the tasks outside the office related to the monitoring of completed tasks, as well as the travel time, have disappeared: thanks to the apps and images collected by drones/smart glasses/smartphone they can work from the office. This was confirmed by the Digiqu@lpub survey, as 68% of respondents said that digitalisation increased work intensity.

2.1.5 Health and safety and outcomes for workers

Both WMPs and drones have resulted in improvements on health and safety issues. WMPs allow workers to travel less, thus reducing exposure to the risk of accidents, while drones enable remote inspections in places such as tunnels or other risky locations.

As explained before, tracking and guidance apps are regarded mainly negatively by field workers. In particular, the monitoring/tracking activity is in addition to the normal working tasks, so workers are required to document constantly, by means of pictures, the work realised. This makes the work extremely time-consuming: the monitoring activities take time and are more intense, since there are more tasks to be accomplished. Moreover, workers think that their work has become less safe, because they often have to work with one hand, sometimes also in dangerous positions, while taking pictures with the other. These elements mean that they are more likely to be injured while working. Drones, however, are perceived as useful instruments that improve health and safety at work.

With regard to teleworking, in the survey conducted in Enel, 35% answered that the place of work used for teleworking during the pandemic did not allow them to work safely and 62% answered that they would appreciate training courses on how to avoid physical health hazards when teleworking. Among the most delicate issues related to teleworking during the pandemic were the inadequacy of the technological tools used and the need to guarantee a 'true' right to disconnect. Moreover 34% of workers answered that with teleworking they felt under pressure or that they were being monitored, thus implying a degree of stress and mental fatigue (Survey by Filctem-CGIL).

2.1.6 Skills and learning

As stated before, the introduction of WMPs and the use of drones meant that companies required additional skills. In the case of WMPs, the new skills have been developed by means of training courses, allowing blue-collar workers to learn the use of the instruments and also new tasks. However, in the case of the use of drones, given the specificity of the competences required, companies had to look for skilled workers on the market, according to the evidence from the interviews.

As said before, apart from the new competences required for piloting the drones, in general terms workers perceive a decline in the competences required because they are asked to work following standard instructions provided by means of the apps. These results are confirmed by the Digiqu@lpub survey, where 43% of respondents said that the introduction of digital instruments in the job did not require upskilling.

With regard to training, workers attending the Focus Group report having several training opportunities. However, training courses are almost all online: this is not appreciated by workers, who believe that it is more difficult to really learn from an on-line training course, more difficult to keep focused, to remember and fully understand. Workers report that often they have seen colleagues combining on-line training with other work tasks, such as, for example, driving their car.

2.1.7 Reconciling work and personal life

With regard to the work-life balance, the results of DGQS provides interesting evidence: 4% of respondents said that digitalisation had increased their work time (online and offline) at the expense of their personal time and another 45% said that digitalisation increased personal time and time spent with the family. In addition, 42% of respondents said that when teleworking from home they find it difficult to clearly differentiate between their working time and their personal time. It is difficult to see a clear pattern on the issue; teleworking seems to both improve and erode the work-life balance, probably depending on the worker's personal situation and on the specific digital tasks and related work organisation. For example, according to the interviews and

the results of the Fictem-CGIL survey, teleworking from home had both positive and negative consequences. On the one hand it reduced time for commuting and encouraged a better work-life balance, but, on the other hand, it became more difficult to differentiate between working time and personal life, creating a very stressful mix especially for women and during the pandemic lockdown. However, as it emerged from the focus group, the possibility to start the working shift leaving home in the morning and going straight to the working site without passing by the office, and the same at the end of the working shift, has significantly improved the work-life balance for the workers involved.

2.1.8 Career prospects and employment security

The impact of digitalisation on career prospects and job security may depend on the type of job in the sector. According to the focus group, in some divisions of Enel, digitalisation led to a reduction in the number of workers. For example, a few years ago there were several companies contact points for citizens who wished to notify a break in service in the electricity network, with several teams located in different parts of the region. At that time, there was a decentralised service, available in the different geographical areas. Nowadays it is instead centralised, thanks to digitalisation. There is one contact point that can monitor and locate the different teams and can send one to where it is needed. This different form of organisation requires fewer workers for the same geographical area.

In a general context of employment reduction, both job security and career prospects do seem to be threatened by digitalisation. With regard to career development and possible upskilling, the interviews and focus groups showed that new advanced skills are generally obtained by hiring new specialised personnel, as in the case of the drone-pilots. However, the compulsory use of applications and tablets while working in the field, as described in section 2.1.3, is leading to a reduction and impoverishment of the skills required for the technicians involved, thus weakening their career prospects and job security.

However, much could depend on the position and role in the company. So, for example, a minority of respondents (21%) to the DGQS believe that the new skills required by digitalisation could reduce their job security, while more think that these skills might open up job or career opportunities in (38%) or outside (43%) their current workplace.

2.1.9 Workers' rights

According to the Digiqu@lpub survey, at least some actions have been put in place to support workers regarding increased digitalisation of aspects of their daily work. The most common have been: the employer has set rules on disconnection (12%); psychological support is offered (e.g. counselling sessions with an expert, team support groups) (11%); a charter or good practices manual has been drawn up regarding digital tasks (17%). It emerged from the focus group that

the right to disconnect was generally respected, but in the survey, nobody answered that 'there is an obligation to leave digital tools in the office during absences'. However, 30% of respondents have not felt any pressure to 'log in' remotely and check their work progress or scheduling during free time since the introduction of digital tools and methods; and 27% answered that they feel pressure but, in the end, it is a personal choice.

2.1.10 Conclusions on the sector

Digitalisation in the electricity sector has had both positive and negative impacts on job quality, depending mainly on the profession and on the technologies applied. In general terms the increasing possibility to control electric networks remotely on the smart grids has resulted in a reduction in the required workforce working along the distribution lines, reducing job security. The possibility instead for technicians to start their shift directly from home, without going to the office, as tablets give them access to all the required data and information, has improved workers' lives. They travel less and have to acquire new competences, moving from being mainly operative workers to taking on administrative and managerial tasks. Workers have had to become progressively more multi-skilled. Also, the use of drones to make the inspections and evaluate the condition of the grids has increased the competences needed in electricity companies, an issue addressed by the hiring of new personnel with specific competences and upskilling of the existing workforce.

However, the use of apps and tablets to monitor and track working activities for technicians working on-site has made work extremely long, intense, and more unsafe. Finally, for those workers starting to work from home during the pandemic, working and living conditions have mainly improved, although the blurred boundaries between work and life can cause stress and overload.

Section 2.2 Public administration sector

2.2.1 Overview of the sector

The public administration sector in Italy includes the so-called 'Central Functions' (ministries, government agencies, compulsory social security), 'Local Functions' (regions, provinces, municipalities), 'Health Sector,' 'Education and Research' and the Presidency of the Council of Ministers. From a labour-relations perspective, the agencies in these four areas are represented, in terms of collective bargaining, by the *Agenzia Nazionale per la Rappresentanza Negoziabile delle Pubbliche Amministrazioni* (National Agency for Negotiation Representation in the Public Administrations, or ARAN). Collective bargaining within these sectors, or bargaining units, is highly regulated and structured. Total employment in the public administration sector is 3.2 million people, with 63% of employment concentrated in the central government, 24.3% in regional governments and 12.5% in local governments. Just over 1 million are employed in schools and

653,000 in hospitals (Cepiku, 2018). Over the ten-year period between 2007 and 2017, total public sector employment in Italy shrank by 7.4%, the fifth most significant drop among OECD countries (Rizzica, 2020). Public sector employment accounts for 14% of total employment in Italy ⁽¹¹⁾ and, as it absorbs 50.4% of expenditure as a percentage of GDP, Italy ranks among the top ten countries in the EU 28 in terms of the size of its public sector.

Table 2. Breakdown, Employment Public Sector in Italy, 2015

Branch	Number Employed	% of Total Employed
Core public administration	938,054	29%
Social security	37,507	1%
Army	99,049	3%
Police	312,205	10%
Employment services	8,798	0%
Schools	1,085,082	34%
Universities	99,134	3%
Hospitals	653,352	20%
Total Public Administration	3,233,181	100%

Source: Cepiku, 2018.

2.2.2 History and patterns of digitalisation in the sector

From the perspective of end users, with regard to comparative 'digital public administration indicators', Italians are far below the EU 27 average in terms of use of the internet to interact with public authorities. Not surprisingly, in 2020 - the first year of the COVID-19 pandemic, citizens' use of the internet to interact with the public administration increased markedly (European Commission, 2021).

On the other hand, with regard to the European Commission's 'European Interoperability Framework', Italy performs at a 'fair' to 'good' level in terms of the framework's three pillars. Specifically, Italy is generally in line with the EU 27 average on the 12 principles of interoperability, while performing slightly below in terms of the interoperability layers. For the third pillar, 'conceptual framework', Italy performs well, with above-average results for 'security' and 'privacy' (European Commission, 2021).

Indeed, recent years have seen significant activity on the digitalisation front, involving agencies throughout the public administration. A few examples: (i) the 2005 launch of the EGovernment

11. <https://st.ilsole24ore.com/art/notizie/2016-03-10/lavoro-186mila-occupati-piu-2015-disoccupazione-calo-all-119percento-100130.shtml?uuid=ACBOoWIC>

Portal for Businesses; (ii) the 2009 launch of *Magellano* - an online knowledge management platform for the public administration; (iii) mandatory electronic invoicing for all public agencies, since 2015; (iv) PagoPA, a system allowing citizens and businesses to make electronic payments to public agencies; (v) the 2020 rollout of the Public Digital Identity System (SPID) which extended the digital identity to more than 15 million citizens, involving more than 7,000 public administration bodies (European Commission, 2021).

In 2012, to support digitalisation, parliament authorised the creation of the Agency for Digital Italy (AGID), which operates out of the prime minister's office. Later, it also set up, under the current Draghi government, the Ministry of Innovation Technology and Digital Transition, which houses the Digital Transformation Department, charged with carrying out the digital transformation priorities for the public administration (European Commission, 2021).

Despite the focus on digitalisation, and the introduction of a number of significant changes in recent years in the public administration, interviews with union delegates and members of CGIL's national Public Function leadership reveal a highly variable landscape across agencies, so much so that it seems almost impossible to speak of 'digitalisation in the public administration.' Some public agencies, for example *Istituto Nazionale Previdenza Sociale* INPS (social security) and *Istituto Nazionale Infortuni al Lavoro* INAIL (disability), are clearly at the forefront of digital transformation: cutting-edge digital tools have been implemented to improve workflow and processes as well as to facilitate citizens' access to services. Other institutions, such as local courts, embassies and consulates have made scarce use of even rudimentary digital tools. Indeed, what stands out from the interviews conducted, is the degree to which digitalisation, until very recently, appears to have *not* impacted the quality of work and collective bargaining.

Several themes emerged through interviews that appear to explain this phenomenon:

- 1) Lack of adequate equipment (e.g., laptops, smartphones);
- 2) Lack of technology infrastructure (e.g., cloud computing, VPN) that allow remote access to data;
- 3) Generational attitudes towards and aptitude for digital tools;
- 4) Management capacity and culture, at the agency and workplace-level;
- 5) Access to continuous training to upgrade skills.

Table 3. Timeline of Remote/ Smart working Legal and Regulatory Framework

1998	Law 191/1998	Regulation of teleworking in the public sector
1999	Presidential Decree 70/1999	Defines telework
2000	Framework Agreement	Identification of criteria and methods for teleworking
2012	Law 221/2012	Requires public administration to implement Telework Plan
2015	Law 124/2015	Promotion of Work-life balance in public administrations
2017	Law 81/2017	Defines 'smart' or 'agile' working
2020	Directive 2/2020	Agile work declared ordinary way of carrying out work in public sector (for Covid emergency)
2020	Law 77/2020	Requires organisational plan for agile work in the public administration
2021	Law 6/2021	Recognizes right to disconnect
2021	Law 17/2021	Reduces to at least 15% (from 60%) the number of employees in smart working

Source: Iacopo and Spinelli, 2021.

With regard to digitalisation, the dominant theme across the interviews was that of 'remote' and 'agile' (or 'smart') work ⁽¹²⁾. While it was the pandemic that thrust these themes to the forefront, it is clear that the issue of remote and agile work will continue to be of strategic importance in the years to come, as is reflected in the recently signed collective bargaining agreement for the Central Functions. We will turn our attention to this later when we look at the strategy of Italy's labour confederations in negotiating a path-breaking agreement with regard to remote and agile work.

In terms of history and patterns, the theme of remote and agile work, as a priority in the public administration, dates back to at least 1998, when 'Law number 16' established rules governing 'teleworking' in the public sector. A number of agreements and laws passed since then have attempted to further define, govern and promote the use of remote and agile work, with the goal of enhancing innovation in the public sector, improving services and helping employees to better balance work and personal life. These include 'Law 81' of 2017 that specifically defines and governs 'smart working.' However, in terms of actual implementation, the reality has consistently fallen short of expectations (Iacopo and Spinelli 2021). More recent attempts at encouraging

12. Note that throughout this section, when we use the term 'remote work' we mean traditional work, performed offsite; when we use the terms 'agile' or 'smart' we refer to a qualitatively different mode of working that prioritizes achieving objectives, irrespective of the time dimension, and that gives the individual worker greater freedom to manage her/his time and way of working. These distinctions are based on the distinctions in the newly-signed public administration agreement.

remote and agile work include the 2017 Circular from then-Minister Madia asking the public administration to make smart work available to 10% of the workforce. As one interviewee commented, following this guidance, at most 1-2% of employees were using the option for remote or agile work, in the best cases.

Regarding management attitudes to remote and agile working, a quote from a focus group participant illustrates some of the challenges involved in broader adoption of this mode of working: *'Obviously managers are often used to a direct relationship with workers, for which they want you in the office. There are some managers that seem to want a chaperone rather than wanting to assess the outcomes the employee produced.'* (FG 4, Public Administration)

This all changed with the outbreak of the COVID-19 pandemic, as the number of Italians working from home jumped from 1.4% to 14.4% and, in the public administration, agile work (which under the first wave of COVID-19 was really working-from-home) was decreed to be the default mode of working (Iacopo and Spinelli, 2021).

The DGQS results seem to offer a snapshot of a post-Covid reality, as respondents (n=250) report high levels of utilization of digital tools (98% say they use them), 34% report using these tools for email, 22% for online training, 22% for exchanging information with partners through web-based applications and 21% for connecting with the end user.

Survey results also supported what we heard from union leaders about the prospect of digitalisation, with 83% of respondents reporting they see digitalisation as good for 'their public service in general', 7% saying it's good for society in general, 70% saying it's good for the quality of service to end users, 63% saying it will help improve working conditions in the sector, and 61% seeing it as helping improve the work-life balance.

2.2.3 Work organisation

We found evidence of limited impact on work organisation, with none of the interviewees reporting concerns around issues like work pace, psychological load, etc. driven by digitalisation. Reflecting the themes already indicated above, interviewees did comment on how a lack of adequate devices and technology infrastructure impacted their work. One area where technology may have impacted work organisation is in agencies with a diminished internal capacity to develop and support new digital tools. Here, an over-reliance on third party contractors was cited as a challenge, in so far as developers unfamiliar with the work often created technology solutions at odds with the actual workflow. In other cases, the workers themselves are expected to implement the new technology, as in the case of a document management application in one of the departments of the Ministry of Justice: *'The staff experienced this [the implementation of a new document management tool] very poorly because, essentially, in addition to managing a caseload*

of 150-180, people that each one of us supported, now I have to spend a significant amount of my time managing, classifying [information].’ (FG 3 Public Administration).

In the public administration, there appears still to be limited use of algorithms for managing workflow. This may change in the near future, however, as technologies like Artificial Intelligence (AI) have been identified as specific priorities with regard to digitalisation in the public administration sector (European Commission, 2021). This was a dynamic confirmed by focus group participants as well.

2.2.4 Working time

The biggest effect on working time appears to be in the context of the COVID-19 pandemic and remote work, with multiple interviewees expressing concern that, without proper training in self-management, employees run the risk of over-work because they lack the ability to organise their own work around objectives, to manage their time and properly disconnect. This concern is consistent with what the literature says about the challenges of agile work (Iacopo and Spinelli, 2021). One focus group participant clearly described the dilemma: *‘... regarding workload, I remember that many colleagues received phone calls or emails from their direct supervisor or department head, outside of normal working hours that created such a heavy workday that you can’t even call it the ‘workday’ anymore. Some were receiving calls at 7:30, 8:00 PM, long after the workday had ended...’ (FG 8 Public Administration).*

2.2.5 Health and safety

Concerns emerged during interviews, primarily with regard to the mental health of workers and the potential negative side effects of remote and agile work. Without proper training and support, the concern is that workers will not be able to establish boundaries around when work begins and ends. Others expressed concerns about the potential negative effects of agile work at home on other family members. This is consistent with the dangers highlighted in the literature about agile work (Iacopo and Spinelli, 2021).

46% of DGQS survey respondents indicated that digital tools had no impact on their physical health, while 21% reported worsening of existing conditions due to digital tools, and 20% reported digital tools causing new physical conditions or pain. Of those reporting physical problems, 24% reported vision problems, 17% back pain, 16% neck pain and 12% physical fatigue. Regarding mental health, 68% reported no impact, while 14% reported digital tools causing new psychological problems and 8% report digital tools worsening an existing psychological condition. Out of 250 total respondents, 139 specified one or more condition, with 32% reporting mental fatigue, 21% anxiety, 15% demotivation and 12% stress.

2.2.6 Skills and learning

Skills and learning were often cited as the reason for the lack of adoption of tools. In one telling anecdote, the interviewee recalls, two weeks into the first lockdown, a co-worker asking *'can you tell me how to check my email from home?'* (INT 2).

We also found positive examples of how ongoing investments in training, going back years if not decades, have allowed the employees at INPS to welcome the digital changes (or 'informatisation') that have helped make their workflow and processes easier. Here, little resistance to digital tools was noted, because workers in general see these as tools that help improve their work experience and provide better, more efficient services to users.

According to interviewees, younger employees appear to be a significant source of innovation, as they bring a set of skills and a more general attitude and aptitude regarding technology to the work than their older colleagues.

2.2.7 Reconciling work and personal life

Unions see remote and agile work as important instruments for helping to better balance work and personal life, as is reflected in the content of the recently negotiated agreement which includes the right to remote and agile work ⁽¹³⁾. Prior to the COVID-19 pandemic, however, very few workers had been able to avail themselves of such instruments. The reality of agile work during the pandemic, however, appears to be at odds with how the law envisions agile work. Law 81/2017 envisions a model whereby the parameters of agile work are jointly negotiated, yet during the pandemic, agile work (really working-from-home) was imposed unilaterally by the employer as an urgent health and safety measure, with workers and managers alike left to improvise solutions with little to no support. Further, demographics like gender, age and income, appear to have clearly affected workers' experience with agile work during the pandemic.

Here too, generational differences in attitudes toward work may come into play, as evidenced by one interviewee, who commented that younger workers more willingly use their own personal devices to enable them to work remotely (e.g. from home or even at events) as a way to better reconcile work and personal life, whereas older workers may see this as an intrusion of work into personal life.

DGQS survey responses allow us to paint a more complete picture regarding training, with 29% saying they did receive formal training, mostly related to specific digitalised tools, while 49.2%

13. Agile and remote work, as a strategic priority to both enhance quality of work and the quality of the service provided to users, came up in several interviews with the public sector unions, including interviews with Oliverio Florindo and Matteo Ariano, FPCGIL and Anna Valcavi, CGIL Emilia-Romagna.

reported receiving no formal training (though a majority of those reporting no formal job training did say they learned 'on-the-job' from colleagues). 65% reported that the training was totally or partly sufficient to meet their needs, while 18% reported that not enough time and resources were dedicated to training.

2.2.8 Career prospects and employment security

Based on interviews, digitalisation does not seem to have impacted career prospects and employment security in the public administration. Interviewees did raise concerns, however, over the possibility that workers' inability to use certain tools could be used against them by employers who would try and argue that termination on such grounds would be justified, and therefore in conformity with the 1970 Workers' Statute's (Law 300/1973) on protection against termination without just cause. To date, however, it appears that lack of adequate training has impacted the adoption of digital tools, as opposed to limiting career prospects and employment security. It is quite possible that this will change, as public agencies, after years of hiring and wage freezes, begin to open up new positions, with a focus on highly skilled positions, including and especially digital skills.

Regarding the acquisition of skills and career prospects, respondents did not see much of a potential impact, with 48% strongly disagreeing or somewhat disagreeing that their new skills are sufficiently taken into account when assessing career progression, while only 26% felt that new skills would open up other job or career opportunities in their current institution, and 52% reported that new skills would not likely change anything career-wise.

2.2.9 Workers' rights

Here the main concerns are around the right to disconnect, freedom from remote surveillance, the right to data privacy and protections against termination without just cause. The right to disconnect is of particular concern in the case of agile work: as the paradigm shifts from how many hours one works to what objectives does one meet, the risk is that workers' hours increase in order to meet specific objectives. (INT 6)

Regarding remote surveillance, Italy's 1970 Worker's Statute specifically prohibits employers from using devices for the purpose of remote surveillance. Serious concerns have arisen, in the context of COVID-19, as employers' use of apps that collect data from smartphones and laptops used by remote workers has significantly expanded. These apps may collect data that may run afoul of the provisions in the Workers' Statute prohibiting remote surveillance (Lippolis, 2021).

Finally, agile work and the use by employers of apps that collect data on performance raise concerns about individuals' data privacy rights ⁽¹⁴⁾ (Lippolis, 2021).

2.2.10 Conclusions on the sector

It is challenging to summarise the situation in this sector, as the differences from one agency to another, and among offices within the same agency, appear to be so great. To account for this discrepancy, we decided to focus interviews on agencies that were more advanced at using digital processes, to highlight best practices. These agencies, like the social security system (INPS), perhaps because of their regular interactions with both businesses and individual users, had decades of experience with digitalisation under their belts. Here, levels of equipment, training and support were much higher than in other agencies. Throughout the system, however, we found evidence of bright spots, usually driven by individual leaders in specific departments.

The COVID pandemic forced public administration employees into working from home, frequently under quite adverse conditions. Lack of adequate equipment, training, ways to securely access data remotely hampered workers' ability to continue to provide services. Here the union often played a critical role, helping to create a network for employees to draw on, advocating for their needs, and helping to get offices back on-line quickly following the shock of the initial lockdown order. In some cases, union delegates took it upon themselves to organise remote work.

The importance of training and prior-experiences with remote platforms was fundamental to helping some offices and agencies be more prepared to respond to working from home, including having colleagues with experience working remotely whom others could draw on for support.

There is widespread support for the continuation and expansion of remote and agile work, though this support is by far universal, particularly among workers with pre-existing mental health conditions or less strong social networks outside of work.

Section 2.3 Hospital sector

2.3.1 Overview of the sector

As mentioned before, the National Health System (NHS) employs around 650,000 persons, 72% of whom are direct-care workers (e.g. doctors, nurses, specialists), and the majority of which (68.7%) are women (Da Rold, C. 2022). Workers are employed in one of Italy's 105 'local health

14. In response to these concerns, the Labour Inspectorate (Ispettorato per il Lavoro) and the Authority for the Protection of Personal Data (GDPD) created a joint task force to study and monitor potential abuses stemming from the use of such apps by employers.

units', which are responsible for managing care in a particular geographic area, including hospitals and clinics, throughout the country (15).

The NHS in Italy is relatively new. Though Italy's post-war constitution guarantees free healthcare as a 'fundamental right', it was not until the 1970s, following the creation of regional, democratically elected governments, that the NHS was created. It is worth noting that the main proponents of the creation of the NHS were Italy's trade unions and the regional governments. Prior to the 1978 establishment of the NHS, healthcare was provided through non-profit health insurers. Today, healthcare is the purview of regional governments, with the central government providing the bulk of funding, establishing minimal levels of health coverage, and monitoring performance. There are wide discrepancies among regions. For example: wealthier areas allocate more per capita funding than poorer regions; organisational and economic models differ among regions and quality also varies widely, with some regions failing to provide the minimum mandated levels of care (Cicchetti, A., Gasbarrini, A., 2016). Despite these challenges, and low per capita spending compared to other OECD countries, Italy's health system provides 'uniformly impressive' results in terms of 'outcomes, quality and efficiency' (OECD, 2014).

Despite historically strong performance, and low per capita funding levels, observers agree that the current system is not sustainable, especially in light of the changing needs of an ageing population, which includes an increased prevalence of chronic conditions, and the persistence of significant differences in both spending and outcomes, across regions (OECD, 2014). The COVID-19 crisis has of course put the system under significant strain, resulting in a wave of resignations, hitting nursing levels (already lower than in other OECD countries) particularly hard, and exposing weaknesses in community health (Lisi, R. 2022).

2.3.2 History and patterns of digitalisation in the sector

'In the last 10 years the world has changed inside hospitals' (INT 9): we see robots in the operating room to assist surgeons, tablets to collect data and monitor patients, the digitalisation of laboratory analysis, online booking of appointments, the digitalisation of patient intake and the implementation of electronic medical health records.

When looking at the last ten years, there are three broad areas of change, related to digital transformation, that have impacted healthcare in Italy: the introduction of electronic medical health records (EMHR), digitalisation of the system for booking tests and appointments with specialists (*Centro Unico di Prenotazione* or CUP) and telemedicine, with telemedicine being the newest and least developed. These three areas are the result of national policy decisions, and the

15. https://www.salute.gov.it/portale/documentazione/p6_2_8_1_1.jsp?id=13

differences in degree of implementation mirror the significant regional differences that continue to characterise Italy's NHS.

According to our interviews (INT 10,11) the pandemic was an important catalyst for the adoption of new technologies. For example, the region of Emilia-Romagna had already put into place a sophisticated system to support the interoperability of EMHR across Local Health Units and hospitals; few, however, were using these systems. This all changed when, during the pandemic, the central government automatically created accounts for all citizens registered with the NHS. Once users (medical professionals, back-office operators and citizens) were forced to use the new tool, they came to see its usefulness.

If the world has changed over the past ten years within the sector, the next four years are set to see a dramatic transformation in the healthcare sector, driven by digitalisation. The *Piano Nazionale di Ripresa e Resilienza* (NRRP), the programme financed by Italy's share of the Next Generation EU funding, dedicates 8.16% (or €15.6 billion euros) to the NHS. Along with funds dedicated to investments in healthcare from Italy's national budget, more than €20 billion will be invested in the coming years to transform healthcare ⁽¹⁶⁾. Priorities include:

- the construction of new structures to provide more care in the community,
- investments in tele-medicine (including monitoring of patients) to move care away from the hospital when possible and provide greater levels of care in the home,
- increased digitalisation in hospitals, including investments in high-tech equipment to replace obsolete tools (e.g., CT scanners, MRI, linear accelerators, etc.),
- strengthening the use of Electronic Medical Health Records (EMHR), the interoperability of data and the ability of local health units to use aggregated data from patient records to improve quality of care in the system,
- investments in the creation of new patient intake centres and the use of advanced technologies including Artificial Intelligence (AI) for better coordination of care among structures and professionals (including coordination of social and home-health supports in the community),
- The use of predictive analytics to guarantee minimal levels of care across Italy's 20 independent regional health systems.

16. <https://www.pnrr.salute.gov.it/portale/pnrrsalute/dettaglioContenutiPNRRSalute.jsp?lingua=italiano&id=5833&area=PNRR-Salute&menu=missionesalute>

Responses (156 total) to the hospital sector DGQS also indicate a prevalence of digital tools within hospitals, consistent with interviews and the literature review ⁽¹⁷⁾:

- A majority of respondents (62%) report using mobile devices, primarily for measuring data, collecting/organising/retrieving information, planning work tasks and communicating with colleagues.
- A large minority (43%) report using machinery operated by digital commands, primarily for monitoring equipment or patients and measuring, collecting/organising/retrieving data.
- Nearly all respondents (98%) report using Information and Communication Tools (ICT), primarily to send and receive emails, online training and learning applications, exchanging information with partners' networks or communicating with patients.

In general, respondents indicated that they perceived digitalisation as positive across a range of indicators: a notable exception however is the relationship between digitalisation and wages, with 30% strongly disagreeing that digitalisation is positive for the improvement of wages; just 14% responded that they strongly agreed that digitalisation was positive for the improvement of wages.

2.3.3 Work organisation

With regard to work organisation, according to our interviews, digitalisation has primarily served to make work and work-flow easier, while providing better outcomes for patients. Because healthcare is fundamentally relational in nature, technology can supplement the work of individuals, but not replace the human dimension. As one unionist put it: 'you can't send a computer. Technology gives you more tools with which to intervene, but you have to intervene' (INT 9).

In terms of where technology has impacted work organisation, 57% of those surveyed responded that digital tools have reduced the time needed for routine tasks, 52% responded that digital tools increased autonomy with regard to completing and scheduling tasks, and 53% said technology helped improved task coordination. Digital tools, according to survey respondents, have been less effective at improving coordination among colleagues, oversight of tasks by supervisors and areas of internal/external assessment. One result that stands out is around the pace of work, with 61% indicating that technology has increased this. Anecdotal evidence indicates that the impact of technology has been felt unevenly across professions: for example, one interviewee reported that doctors complain that 'we've become office employees, not doctors' (INT 12).

According to interviews, technologies have improved the speed with which laboratory diagnoses can be conducted, the ability of the doctor on call to conduct certain tests (e.g., ultrasound)

17. While the survey is not statistically representative, we report the numbers here as illustrative of the situation within the NHS.

him/herself, while reducing the physical burdens on operators associated with lifting and moving patients. The use of digital tools, like EMHR and technology, to coordinate patient intake and care also facilitates improved follow-up of patients' post-discharge. For example, hospital staff can automatically schedule follow-up visits and tests with patients, which improves outcomes and reduces re-admissions.

Telemedicine and the shift toward community care will have a major impact on work organisation, as well as causing a shift in the balance of power among specialities. A salient example is radiology (imaging). Currently medical doctors conduct and interpret scans. With the use of telemedicine, radiology technicians will conduct scans locally to be interpreted by medical doctors remotely. On the one hand, this will allow medical doctors the opportunity to work remotely, perhaps closer to home; on the other hand, this will result in a shift in importance away from doctors to technicians within this field, with the interviewer expecting a rise in conflict between radiology technicians and medical doctors working remotely (INT 12)

Another example of how technology has impacted – or perhaps more accurately enabled – change regards ambulances. In the Emilia-Romagna region ambulance crews are no longer required to include a medical doctor, as long as there is there is a skilled nurse ('emergency technician') aboard. The emergency nurse now consults remotely with the emergency doctor to determine the best course of treatment based on the specific emergency (INT 12).

2.3.4 Working time

Digitalisation has not had a major impact on working time. Working time within the hospital, according to one interviewee, is primarily driven by two factors: lack of adequate staffing levels and the flow of patients into the hospital during a given shift. (INT 9)) For most DGQS survey respondents, this is the case, with a vast majority (75-85%) of respondents reporting no change to working time as a result of technologies. That said, some survey respondents did indicate an impact of technology on working time. For example 22% reported an increase in the number of working hours per contract, as a result of digital tools, while 18% reported an increase in unpaid overtime hours, and 21% reported an increase in unsocial working time. It is likely that these results are influenced by the specific role of the individual respondent, as survey respondents included administrative personnel in the Local Health Units (who may be more able to take advantage of remote work, thereby reducing commuting time for example), as well as hospital administrators who, presumably have 'more work to take home,' since online platforms now allow one to log in from anywhere.

2.3.5 Health and safety

Digital tools within the hospital have an impact on both worker and patient safety. For example, technologies that assist operators with lifting and moving patients enhance both outcomes. A

majority of survey respondents indicated that new tools and methods did not impact physical health; though a large minority 33% indicated that new tools and methods either triggered a new condition or exacerbated an existing condition. The most common types of conditions reported were vision problems, neck and back pains. Most respondents indicated no impact on mental health, while 21% reported new mental health conditions or the exacerbation of an existing condition by digital tools and methods. Mental fatigue, stress and anxiety were the most prevalent mental health concerns raised. This is another data point that merits deeper examination to determine if technology is the cause or not, given the effect of the COVID-19 pandemic and depleted staffing levels within healthcare.

2.3.6 Skills and learning

Alongside training in the use of new digital equipment, there is an emphasis on training in proper protocols, including coordination across roles, to improve patient outcomes, especially in the area of reducing hospital acquired infections. (INT 9)

Specifically, regarding digital tools, 49% of DGQS survey respondents indicated that they had not received formal training in digital tools (it is worth noting however that more than half who said they received no formal training did learn 'on-the-job' and from peers.) 29.4% reported having received only training in specific digital tools. Related to this, 32% of DGQS survey respondents reported having to learn both general digital literacy skills and specific digital skills, while 30% reported having to learn specific digital skills. 18% felt that the training provided totally matched their needs, while 56% said the training partly met their needs, with regular updates needed.

2.3.7 Reconciling work and personal life

This is an area where technology can have a limited impact, due to the fundamentally relational nature of healthcare, and the current staffing shortages experienced in Italian hospitals. Survey responses in the area of work-life balance are also inconclusive. The new healthcare agreement (signed in 2022 covering 2018-2021) introduces the same right to remote and agile work as in the new public administration agreement. Combined with a move toward greater in-home and community-based care (i.e., not in the hospital), a transformation made possible by new digital technologies, we may see positive outcomes on the work-life balance. But according to the interviews and literature review, staffing shortages (particularly among nurses) are the main obstacle to better work-life balance, as increasing demands are distributed among a smaller number of staff. (INT 9) Regarding the reconciliation of work and personal life, 55% of DGQS survey respondents neither agreed nor disagreed that digital tools increased personal time and time spent with family. Only 14% agreed or strongly agreed.

2.3.8 Career prospects and employment security

An interesting trend reported by interviewees is the resignation of many doctors, and their shift to cooperatives that provide outsourced medical services to the public health system. While doctors who make this shift jeopardise their work-life balance, they stand to make a significantly greater amount of money (while working in the same public structures as before): according to interviews, doctors can get paid up to €1,400 per shift under this setup.) Regarding career prospects and digitalisation, only a minority of DGQS survey respondents saw new digital skills as potentially enhancing their prospects. Just 19% somewhat or strongly agreed that new skills would open up opportunities within their current institution while only 23% somewhat or strongly agreed that new skills opened up opportunities outside their institution.

2.3.9 Workers' rights

As the issue of remote and agile work in this sector is just emerging, the impact of digitalisation on workers' rights may not yet be clear. Among survey respondents, 17% reported pressure from a supervisor to log-in remotely; yet this is 15% of a small population as only 5% of respondents indicated the possibility of logging in from home.

2.3.10 Conclusions on the sector

The healthcare system has been impacted significantly by technology and will see further and accelerated changes in the future, driven in large part by the Next Generation EU funds dedicated to health care. Although this sector did not experience the same widespread use of remote work under COVID as the public administration, the pandemic was nonetheless a catalytic event, encouraging the widespread use of existing technology (EMHR) that was already in place, but had been scarcely utilized by patients and professionals. As a result, patient care can be more effectively coordinated, including post-discharge; doctors and patients regularly use the EMHR, reducing the number of office visits required, potentially freeing up staff to provide greater attention to patients who need more support in navigating the healthcare system. As the healthcare system in Italy remains highly fragmented, the degree to which technologies are implemented, the quality of patient care and the quality of work vary widely across the system.

Despite a system that is awash in new technologies, we see evidence of inadequate training, especially in general digital literacy, and perhaps an over-reliance on on-the-job training. This will no doubt impact the ability of workers to fully take advantage of new technologies, both to their own benefit and to the benefit of patients. While we have seen the ability of technology to enhance safety in some areas, new digital technologies also appear to exacerbate existing conditions or create new ones, including mental health conditions. Of course, the data we collected must be understood against the backdrop of the COVID 19 pandemic, which placed the healthcare system under unbelievable strain while forcing the system into the widespread adoption of new technologies.

Section 2.4 Overall sectoral cross-cutting conclusions

The process of 'digitalisation,' often expressed with the shorthand 'Industry 4.0,' can be broken down into three distinct, overlapping phases: 1.) digitisation, 2.) digitalisation and 3.) digital transformation. Digitisation, concerning the transfer from analogue carriers of information (i.e. paper) to digital (i.e. databases) began in the 1960s; while digitalisation, which concerns the application of digital technology to existing processes, began in the 1980s. The third phase, transformation, refers to the creation of 'new business models based on the possibilities of digital technology and platforms to integrate business processes.' (Grovers and van Almsvoort, 2019).

In the case of Italy, we can see the overlapping nature of these three phases: while archival documents continue to be digitized, changes like the massive introduction of smart working in the public administration due to the pandemic, electronic medical health records in the hospital sector and new technologies in energy have resulted in massive digitalisation of process. We already see the beginnings of digital transformation: and super-charged by the Next Generation EU funds, the process of transformation will only accelerate in the coming years. Technologies like cloud computing, artificial intelligence, internet of things, big data and blockchain, will increasingly be adopted across sectors, implying radical changes that will have significant impacts on the 'quality and quantity of work' (INAPP, 2017).

There is clearly much promise to these new, digital technologies. We have seen how new technologies can free up labour to focus on higher-value added services to citizens, improve workflow, provide opportunities for upskilling, and reduce stress and support better work-life balance. There are also perils with new technology. In the Italian case we have also seen how technology can increase work intensity and stress, de-skill certain jobs and increase alienation, particularly when changes are made without ample involvement of those involved in carrying out the work. As research has shown, technology is not neutral, both because technologies are developed in specific social, political and economic contexts and because technologies are applied in specific social, political and economic contexts. (INAPP, 2017). The degree to which the promises of technology, to increase the quality of services to users and citizens and improve the quality of work for employees, are realised will be determined by the social and political context in which those technologies are adopted and implemented. (INAPP, 2017; Ribarova et al, 2022).

SECTION 3. DIGITALISATION AND SOCIAL DIALOGUE

Section 3.1 Introduction: contextualizing the national system of industrial relations

The Italian system of industrial relations is characterized by a high degree of voluntarism and legal abstention, in the private sector at least, widely centred on the primacy of collective autonomy. Topics such as workplace representation, social partners' representativeness to sign binding collective agreements, minimum wages, worker participation, right to strike – although all covered in the 1948 Constitution – have received a very limited transposition in laws over the decades. Essentially, in the public sector, since 1997 there is a law that regulates some of these matters, as well as the right to strike in the so-called 'essential public services'. As an alternative to State interventionism, a fundamental role has been played by a widespread and multi-level practice of social dialogue and collective bargaining. This is still the situation, although a public debate had been opened during the second Conte government about the possible introduction of an unprecedented statutory minimum wage, with a law on social partners' representativeness and/or extension mechanisms of the sectoral collectively agreed upon minimum wage. Instead of the law, tripartite and / or cross-sectoral framework agreements have governed the current functioning of industrial relations. We will describe this system in more detail, after a brief overview of the main actors in the Italian social dialogue.

In Italy, the situation regarding the social partners is fragmented and complex. On the trade union side, the three most representative confederations are still those that emerged just after the Second World War. They are: the Confederazione Generale Italiana del Lavoro - CGIL (Italian General Confederation of Labour), which is the oldest, as it dates back to 1906; the Confederazione Italiana Sindacati dei Lavoratori – CISL (Italian Confederation of the Workers' Trade Unions) and the Unione Italiana dei Lavoratori – UIL (Italian Union of Workers). In terms of identity and values, these organisations reflect the various cultures and political orientations expressed in the world of work: leftism, social Catholicism, reformist social democracy, duly updated through the decades up to now, when they cooperate fairly frequently at all levels, despite their background and organisational autonomy. Each of these 'umbrella' confederations has a multi-level and cross-sector structure and services, with a dozen sectorial federations and a capillary network of local structures. Public service workers can be represented by the mostly private sector unions, as in the case of the electricity industry – merged within the energy and chemical federations⁽¹⁸⁾ – or by the 'public function' federations, specialized in the representation of all public servants and workers, as in the case of the central and local administrations, or the

18. In 2019, FILCTEM-CGIL had 187,917 members; FEMCA-CISL had 106,411; UILTEC-UIL had 117,607; the total number of affiliated members in the chemical and energy sector was 426,381 (Leonardi and Pedersini, 2022).

health and hospital branches ⁽¹⁹⁾. Doctors, as well as teachers and academics, may have their own union federations.

Together, CGIL, CISL and UIL represent around 11,7 million members ⁽²⁰⁾, both active and retired. In fact, there is a particularly high share of retired workers – almost 50% of the whole membership – which is a record at European level. In addition to these main and historical trade unions, which participate in industrial relations at every level, there are other minor autonomous confederations – such as Confsal, Ugl and Cisl, for example – institutionally considered ‘representative’ enough to have seats in tripartite bodies, and with more than a million and half members all together. Some other autonomous union federations are present and even strong in certain specific sectors, such as banking or air traffic control. Extreme left-wing, grassroots unions are also very active in sectors such as logistics, public transport, hospitals and schools.

The rate of unionization in Italy is variously estimated at around 35%, and has remained relatively stable over the last decade, in spite of a slow downward trend which began in the 1980s. It is, however, one of the highest among the EU Member States, behind only the group of Nordic countries and Belgium (with the Ghent system), and remarkably before the other countries with a comparable population and historic background.

The situation regarding employers’ associations is highly complex and even fragmented, according to size of company, nature of ownership, legal regime, multi or mono-sectoral coverage, ‘political’ orientation. There are no less than 8 or 10 major cross-sectoral and ‘umbrella’ organisations, compared with an average in Europe of two or three. Among the main and most influential organisations are Confindustria (medium-large enterprises, mainly manufacturing but not only), Confcommercio (medium-large commerce and tourism businesses), Confcooperative and Legacoop; a number of craft and small business associations, municipal service companies; ABI for the banks. It is difficult to measure the membership density, but it can be estimated at approximately 50%.

In the public sector – where the employment relationships are entirely ruled by civil law, and which is contractually divided into four major branches (central administrations, local administrations, education and training, and health) – the trade unions are the same as in the private sector, with their sectoral federations. At central level, however, there is only one employer: the ARAN (*Agenzia per la Rappresentanza Negoziabile delle Pubbliche Amministrazioni*). ARAN is the public agency in charge of negotiating pay and working conditions at the national

19. In 2019, FP-CGIL had 379,397 members; FP-CISL had 254,628; UILPA-UIL had 55,608 (Leonardi and Pedersini, 2022).

20. In 2019, CGIL had 5,346,571 declared members; CISL had 4,079,490; UIL had 2,281,355: a total of 11,707,416 (Leonardi and Pedersini, 2022).

peak level for the four above-mentioned sectors. In doing so, ARAN determines the budget allocated to the renewal of national agreements, which – in their turn – establish what to allocate for performance-related decentralized bargaining. ARAN collects and certifies all data relating to the number of members and the votes obtained in the national election of workers' representatives at the workplace level. On that basis, it decides which unions can be called 'representative' and, as a consequence, can be present at the negotiating tables. In the public sector there are dozens and dozens of micro trade unions competing for visibility and in the election of the RSUs, but only four or five of them (always CGIL, CISL, UIL, plus Confsal and another minor organisation), reach and exceed the representativeness threshold required by law to take part in national collective negotiations. That is, they obtain over 5% as a weighted average between members and votes obtained in workplace representative elections.

Regarding *collective bargaining and wage setting*, in Italy, the national industry-wide collective agreements (CA) are the fulcrum of the whole system and the expression of the principle of trade union freedom, in accordance with Article 39 of the Constitution. Since the 1993 tripartite Protocol, collective bargaining has a two-tier structure – national industry and company or, alternatively, regional level – centrally coordinated by the national industry level, which can be considered predominant. Other bipartite cross-sector and inter-confederate agreements (concluded in 2009, 2011-14, 2018-19), resulting from the social dialogue, have further defined and updated in detail the functioning of collective bargaining. The national industry-wide agreement usually lasts three years and establishes the basic rules that regulate the individual employment relationship and collective industrial relations. Its key functions include the safeguarding of purchasing power based, since 2009, on a harmonised consumer price index (HICP), net of the imported energy costs, as delivered yearly by the National Institute of Statistic (ISTAT). Formally, the national CA does not have an *erga omnes* legal effect (since it lacks an administrative extension mechanism) but only a 'private' effect: it is only binding on the members of organisations which signed up to it. However, according to a jurisprudential interpretative practice, its main contents – for example the minimum wage for each level of the sector's jobs classification – tend to be more or less spontaneously extended to all employers, including those which are not associated with the signatory organisations.

Collectively agreed pay scales, at industry-wide level, fix the benchmark for the concepts of 'sufficiency' and 'proportionality' of the remuneration, based on the quantity and quality of the work performed, in order to guarantee a dignified life to the workers and his/her family, as prescribed by the Constitution (Art. 36). Each judge in the country, if requested by a worker and his/her union, will apply the scale and gross wage floor established in the industry where the employee is employed, but may be paid less. Beside the judges, the Social Security Institute too (INPS) uses the minimums set in the most representative national agreements to define the employers' social security contributions for pension purposes. This system has up to now

compensated for the double and peculiar absence, in Italy, of both a) an administrative extension mechanism and b) a statutory minimum wage. The coverage of the national industry-wide agreements is commonly estimated at over 90% of all wage earners. This is among the highest levels of coverage of the EU Member States, well above the target of 70% referred to in the proposal for a Directive on adequate minimum wages in the EU. Collectively agreed minimum wages are set at, on average, 80% of the median (Kaitz Index), which is again beyond the 60% target in that proposal. However, working poor and low-wage workers are a serious concern, as more and more jobs are based on very short, involuntary part-time and fixed-term contracts, far beyond the EU average (62% versus 16%), from which workers cannot attain a decent level of income, especially in agriculture and some branches of the private sector. Workers are quite frequently hired without a contract, on a level of pay below that set out in the collective agreements.

The national industry-wide agreements signed by the most representative associations are now subject to downward pressure from alternative and less costly agreements, with the phenomenon of the so called 'pirate agreements'. According to the national register kept by the National Council of Economy and Labour – CNEL ⁽²¹⁾, today almost a thousand national agreements are currently on file; there were around 350 ten years ago. In spite of all this fragmentation and proliferation, less than one third of all the registered texts, signed by the sectoral federations of the comparatively most representative associations (CGIL, CISL, UIL and their historical counterparts on the employers' side), cover, on average, 97% of all employees in their respective sectors. All the other agreements are signed by minor organisations (62%), sometimes completely unknown, with coverage which is for the most part ephemeral (a mere 3% on average), maybe only a few dozen companies and a few hundred workers. Their function is essentially to compete downward with major agreements; a factor of internal 'wage dumping', viewed with great concern by experts, policy makers and – of course - major social partners. Totally insignificant in the public sector and in the large industrial manufacture, their role can be quite insidious in sectors where jobs are more precarious and union density is lower, as in some tertiary private services. This can be, for instance, the case of the employees in the cleaning services, doing their job in public hospitals and private offices, framed into bogus cooperatives and "pirate agreements".

Decentralised collective bargaining, at the firm or territorial level, is not mandatory but is based on mutual practices and specific power relations. It covers no more than 25% of companies with over 10 employees and 35% of workers. In sectors characterized by a predominance of very small firms and/or discontinuous and seasonal jobs (crafts, tourism, construction, agriculture), the second level of bargaining is territorial. The two levels are centrally coordinated according to a principle of specialization and non-repetition: the territorial level incorporates and integrates the areas

21. <https://www.cnel.it/Archivio-Contratti>

delegated to it by the industry agreement, which expressly defines procedures and scope for deviation. Firm-level collective agreements are binding for the whole workforce if supported by 50 + 1% of the members of the RSU, with the possibility still of a referendum if requested by a qualified quorum of workers. This level of bargaining typically deals above all with so-called 'variable pay', linked to productivity or quality objectives, but also to new issues, as in the case of work flexibility, working time, supplementary welfare and benefits, work-life balance. It is at this level that the issues of work organisation are mainly dealt with, and therefore the various forms that the involvement of workers can take. (Bordogna L., Pedersini R., 2019.) Digitalisation, especially in the form of 'remote working', is increasingly the subject of company and workplace negotiations and agreements. Especially after the outbreak of the Covid pandemic, millions of workers experienced for the first time a mass move to remote work through digital appliances. In these cases, the collective agreements set out rights and limits on the use of remote working, covering issues such as remote surveillance and the right to disconnect. In order to expand decentralized bargaining, some reforms – also encouraged by the new EU governance – have aimed to shift the hierarchy of the two levels, reducing the importance of the national agreement to the benefit of the firm and territorial level by, for instance, allowing derogations and opting out clauses. (Cipriani A., Gramolati A., Mari G., 2018; De Sario B., Di Nunzio D., Leonardi S., 2021; Gramolati A, Sateriale G., 2019; Maiolini C., De Luca A., 2021; Signorini E., 2018.)

In order to empower and expand decentralized bargaining and firm-level agreement coverage, some legal reforms – also pushed by EU governance, through the European Semester and the "Country Specific Recommendations" – have aimed at shifting the hierarchy of the two levels, reducing the weight of the national agreement to the advantage of firm and territorial level agreements; for instance by allowing derogations and opting-out clauses. Furthermore, productivity and gain sharing awards – which in some branches (chemical, electrical, metal, financial) and large companies can correspond to an extra-month's pay – can benefit from reduced taxation. In spite of all these efforts, firm-level bargaining has never taken-off as expected, and the collective bargaining system can still be called "centrally organized" (Leonardi and Pedersini, 2018).

Regarding employees' representation at the workplace level, the 1970 'Workers' Statute' (Act. No. 300/1970) reflects in more detailed and mandatory terms the constitutional principle of trade union freedom (Article 39.1), with a series of individual and collective liberties and prerogatives in workplaces, including the election of trade union representatives in production units with over 15 employees (5 in agriculture). Since a tripartite protocol signed in July 1993, the name of this work council is '*Rappresentanza Sindacale Unitaria - RSU* (Union Unitary Representation); it consists of a 'single-channel' union structure, entirely elected by all workers, whether unionized or not. The RSU is endowed with both bargaining and information and consultation rights. It has a plural but unitary composition. Lists of workers of any political view can participate in the elections, normally

representing trade union associations that are signatories to national agreements in the sector, or who are otherwise able to collect the signatures of 5% of employees in the workplace. The three main confederations normally represent, at least in a cross-sector average, more than 80% of the votes. This is certainly the case in the public sector, where elections and results are much better standardized and certified. Furthermore, the RSU has the power to call a strike, without particular procedural constraints, if the company does not provide essential public services. In this case, a list of strict rules must be complied with: for instance, a minimum level of service must be guaranteed, a warning must be given in due time, a certain time period must elapse between one strike and the next. Collective agreements are binding for the whole workforce if supported by 50 + 1% of the members of the RSU, with the possibility still of a referendum if requested by a qualified quorum of workers. It is common practice in medium to large companies to set up joint committees with technical and consultative prerogatives.

As the minimum threshold for such elections is fixed at 15 employees, only a minority of companies and workers benefit from workplace representation, thus making it more difficult to have a second level of bargaining, with all the negative consequences for improving working conditions and wages. The lack of real significance of firm-level bargaining is likely one of the explanations for the stagnating wage dynamic in Italy in these last 30 years, with a majority of employees barely attaining the purchasing power level of 1993.

Regarding workers' participation, although an entire article of the Constitution (Article 46) sets out the workers' right to 'collaborate' in the company, no law has ever translated that principle and aim into provisions on board-level employee representation and codetermination. There are no such rules even in bodies with public participation or state-owned firms, with just a few exceptions, such as the board of the social protection institutes. Financial participation in the form of share-ownership plans has also remained marginal. The real pillar of the 'Italian form of participation' is the right to information and consultation, provided for by law in certain specific cases, almost always based on EU laws (collective redundancies; company transfers; health and safety), but above all enshrined in collective agreements, national and decentralized. In the so-called 'first contractual parts' phase, the negotiating parties define in detail the exercise of these rights, by planning regular meetings (one or two a year), the list of subjects to be discussed, the creation of joint observatories and committees, which are very common in medium and large companies. The subjects are generally related to the current and forecast employment situation, health and safety interventions, technological innovation, equal opportunities, continuing professional training, supplementary welfare. In terms of unions' cultures, traditions and practices, sectors such as the energy and electricity sector and, to a lesser extent, municipal public services, have a stronger tradition of participatory industry relations, probably due to the different weight and 'political' orientation of the public or quasi-public employer. Since the mid-1980s, very frequent use has been made of 'protocols', strongly emphasizing the strategic importance of the

social dialogue and constructive forms of workers and unions involvement in the company decision process. (Carrieri M., Nerozzi P. Treu T., 2015; Fondazione Unipolis, 2017; Leonardi S., 2016.; Leonardi S, Gottardi D., 2019.)

'Direct participation' is a new and expanding form of involvement. It rarely takes place on the basis of collective agreements. Instead, it tends to occur at the unilateral initiative of management and is used more or less informally as part of the new HRM techniques, inspired by lean production and continuous improvement approaches. Most frequently, direct participation takes the form of a suggestion box, internal surveys on the corporate climate and well-being at work, but above all teamwork, which is gaining strong momentum, in conjunction with the adoption of the socio-organisational paradigms mentioned above.

A peculiar form of participation, in Italy, is so-called '*Bilateralismo*': bilateral bodies and funds, supported by law but financed and jointly managed by the main associations of the social partners, according to the provisions contained in collective agreements and governance protocols. These bodies and funds provide the workforce with complementary welfare schemes for pensions and health assistance, continuous training, and income support in case of crisis or temporary suspension of work and income.

The public debate around digitalisation started in Italy when the government's Industry 4.0 plan was launched in 2016; however, analysis of government documents and the initial reactions of the social partners, too, suggests equal technological 'fascination' with the Plan (Battista et al. 2022).

As is well described in the national report on Italy from the Irel project ⁽²²⁾ (Battista et al. 2022) on which this chapter is based, the decline of public debate in Italy is reflected in the change in position between the reports produced by the Chamber of Deputies' Permanent Commission on 'Productive activities, tourism and commerce' (June 2016) and the Senate 'Labour and social security' Commission (2017). While the first document carries out a reasoned and sufficiently exhaustive mapping of the different meanings attributable to the digitalisation processes, not confining it to industry alone, the second one appears more like a 'position paper' or a political document in which digitalisation is exalted as a process of liberation from work. It describes how

22. The Irel project aims to analyse the way in which industrial relations and social dialogue are tackling the problems arising from the transformation of employment patterns prompted by technological innovation, with a particular concern for the so-called 'digital revolution'. The impact of digital technologies on working conditions and on employment contracts has been studied from manifold but fragmentary perspectives. What has been missing so far is a comprehensive and cross-sectoral analysis of the digital transformation as a whole, with a view to shedding light on its implications on workplace configuration, on the organization of production processes, and on the role that social partners can play in regulating and managing the impact of such innovations on working conditions, productivity and the competitiveness of European companies. <https://irel.fmb.unimore.it/>

employees will no longer be subject to working time and emphasises the need to widen the regulatory net in favour of individual negotiation practices. The adaptive attitude shown by social partners, at least initially, continues to be a distinctive trait even characterising the unions' vision of digitalisation. It was only in January 2018, during its Policy Conference (Conferenza di Programma), that the CGIL's General Secretary appeared to step back from the union's previous adaptive approach and focused on the need to 'govern the changes imposed by digitalisation' rather than just managing its impact on the social realm (Dazzi, D., Whittal, M., 2018).

This kind of attitude has its roots in the past. Industrial relations in Italy have historically lacked a proper set of regulations and collective bargaining practices on the introduction and implementation of technological and organisational innovations (Cirillo et al., 2020). As stated by Della Rocca (1985), until the 1980s national collective bargaining had not resulted in specific regulation of work organisation and workers' welfare in the case of the introduction of new technologies. This is mainly due to the traditional delay of Italy in ICT technologies, which, of course, inhibits inclusion of these points in agreements, and to the contingent and non-structural nature of use of new technology in the absence of state-led industrial policies. From a functionalist point of view, Ponzellini, (2013), moreover, points to the prevailing conflictual culture of national industrial relations as one of the reasons explaining the delay of Italian trade unions in negotiating flexible working arrangements. Even the advent of lean production strategies at the end of 1980s did not reverse this trend. A radical change occurred in 2008: with the economic crisis, collective bargaining at the company-level started to include flexible production plans and work arrangements to cope with market fluctuations. In the absence of a structural collective bargaining strategy on technological innovation, four instruments of contractual regulation seem to be effective against this trend:

- Company-level collective agreements on new forms of work organisation
- Consultation and information rights
- Employee participation in all its forms
- Continuous training.

Section 3.2 Trade unions' position on digitalisation at national level

As illustrated previously, the Italian system of industrial relations is characterised by a high degree of voluntarism and abstention of law, in the private sector at least, widely centred on the primacy of collective autonomy. Topics such as workplace representation, social partners' representativeness to sign binding collective agreements, minimum wages, worker participation, right to strike – although all covered in the 1948 Constitution – have received a very limited transposition in laws over the decades. Essentially, in the public sector, since 1997 there has been a law that regulates some of these matters, as well as the right to strike in the so-called 'essential

public services'. As an alternative to State interventionism, a fundamental role has been played by a widespread and multi-level practice of social dialogue and collective bargaining. This is still the situation, although a public debate is ongoing about the possible introduction of an unprecedented statutory minimum wage, with a law on social partners' representativeness and/or extension mechanisms, currently under scrutiny in the Parliament. Instead of the law, tripartite and / or cross-sectoral framework agreements have governed the current functioning of industrial relations. We will describe this system in more detail, after a brief overview of the main actors of the Italian social dialogue.

In Italy, the situation regarding the social partners is fragmented and complex. On the trade union side, the three most representative confederations are still those that emerged in the early post-war years. They are: the *Confederazione Generale Italiana del Lavoro* - CGIL (Italian General Confederation of Labour), which is the oldest, as it dates back to 1906; the *Confederazione Italiana Sindacati dei Lavoratori* – CISL (Italian Confederation of the Workers Trade Unions) and the *Unione Italiana dei Lavoratori* – UIL (Italian Union of Workers). In terms of identity and values, these confederations reflect the various cultures and political orientations expressed in the world of work. With regard to the topic of digitalisation, trade unions lament their lack of involvement in public decision-making processes on digitalisation and technology issues, especially regarding the transformation of work. The only two social dialogue fora reported are the 'Steering Committee' linked to the Industry 4.0 Plan and, later, the Commission on Artificial Intelligence. Nevertheless, in some regions and local areas, social dialogue initiatives have taken place: the Emilia-Romagna Region has recently (2020) signed a 'Pact for work and climate' ⁽²³⁾ - involving all social partners at the regional level, associations, Universities and other stakeholders – which calls on all actors to cooperate in order to stimulate investment in the digital transformation of the economy and society, starting with its three essential components: infrastructure, access rights and people's skills.

Positive examples like this are still exceptions, and the recent approval of the NRRP within the Next Generation EU has not reversed this trend. National trade unions, forming a common front without key differences, criticise the government for not involving them sufficiently in the phase of defining the national Plan, despite its strong and evident impact on employment and the quality of work ⁽²⁴⁾. In this regard, trade unions have asked for a concrete commitment from the Government, calling on them to regulate in law the introduction of a form of governance in which all social partners can be represented, informed and consulted. Further, they asked for the governance to also be aimed at monitoring how the funds are actually used, to direct the

23. <https://www.regione.emilia-romagna.it/pattolavoroeclima/homepage>

24. This position became explicit when the Tus proposed an amendment to the decree law of 31 May 2021 on the governance of the NRRP, https://www.collettiva.it/copertine/economia/2022/01/28/news/confronto_lo_dice_la_legge-1819493/

investments in a common and shared direction. Another criticism of the NRRP voiced by national trade unions is the lack of a clear obligation to maintain employment levels in those companies benefiting from public funds. In December 2021, therefore, a new protocol on participation and involvement in the NRRP was signed by CGIL, CISL and UIL and the Italian Government: the protocol introduces some preventive forms of information and consultation of trade unions at national, regional and local levels, with regard to the social, economic and employment impact of the investments and reforms envisaged in the NRRP. In these forms of information and consultation, specific attention will be paid to:

- Monitoring of cross-cutting priorities (vulnerabilities, youth and female employment, South and territorial cohesion, digital and ecological transition);
- The use of the NRRP funds in combination with other European funds available at national, regional and local levels;
- The industrial policies needed to ensure reconversion processes (automotive, circular economy);
- All aspects directly and indirectly related to work.

Section 3.3 Electricity production and distribution sector

3.3.1 Collective bargaining in the sector

In line with the general collective bargaining context described in Section 3.1, the electricity sector has an industry-wide collective agreement which covers about 50,000 workers, as well as decentralised collective company agreements. Looking at the social actors which participate in the collective bargaining process, the most representative trade unions are Flaei-CISL, Filctem-CGIL and Uiltec-UIL, which are all affiliated to the three 'umbrella' confederations mentioned in Section 3.1. The most important employers' associations are Utilitaria and Elettricità Futura, the second of which is affiliated to Confindustria. Historically, Utilitaria tended to represent the so-called multiutility companies, whereas Elettricità Futura was more focussed on the specific electricity sector. However, this sharp distinction is progressively disappearing because of the changes in the electricity market and the core business of its players.

Multiutility companies are public utility companies, which may be public or private, national or local, and have undergone significant changes over the last 15 years in parallel with a process of convergence leading them to operate simultaneously in several sectors (electricity, natural gas, water, telecommunications), with a strong presence in the final stages of distribution and sale. Their growth was encouraged largely by the liberalization and privatization of public services and the consequent corporate reorganisation process that affected all the main operators in the sector (Mencarelli and Mereu, 2018).

As illustrated before, the electricity sector is characterised by a relatively small number of very large companies, which makes it very different from the rest of the national industrial sector. Indeed, Italian productive structure is primarily characterised by small and medium size companies; industry-wide collective agreements play a key role in this rather fragmented structure by regulating economic and working conditions. On top of the common general standards and rights established by industry-wide collective agreements for the different industries, there are a number of decentralised company agreements aimed at providing further and integrative economic and normative elements for workers, as described in Section 3.1.

The electricity sector is thus dominated by a very small number of companies, particularly the ex-monopolistic national-owned company Enel, which accounts for about 57% of total employment in the sector. According to the interviews, therefore, company agreements in a way tend to influence industry-wide collective agreements. This is the reason why, as is currently the case, company agreements in Enel often pre-empt national collective bargaining, where possible; these company agreements determine the most strategic elements, which are later developed in the national collective bargaining.

The three largest sectoral trade unions reflect in a way the political orientation of the three confederations they belong to. Fictem-CGIL and Uiltec-UIL are industrial unions that cover a large number of sectors and industry-wide agreements while Flaei-CISL covers only the electricity sector and the related agreement. Thus, the former tends to take a broader approach to contractual issues, including matters that may go beyond the electricity sector. Overall, the unionisation rate in the sector is about 50%.

3.3.2 Role and importance given to digitalisation in the national industry-wide agreements

The last industry-wide agreement was signed in 2019, and the bargaining process for its renewal will be launched between May and June 2022. The key issues addressed at the time were:

- Specific attention paid to young workers, with the introduction of mechanisms that could allow them to accumulate additional resources for their future retirement;
- Introduction of specific measures for cases of harassment or gender-based violence in the workplace (a highly innovative issue addressed for the first time in an industry-wide contract);
- Coverage by the agreement of companies working on renewable sources of energy with fewer than 25 employees, which were formerly covered by other industry-wide contracts such as those for the mechanical or the service sector. This would make it possible to have one agreement for the entire electricity sector, thus increasing salaries and improving

workers' rights. Moreover, from a strategic perspective, this point was particularly important, as the renewable energy sector is growing and will become more and more relevant in the future.

The agreement signed in 2019 ⁽²⁵⁾ did not cover points specifically linked to digitalisation. However, in the current process negotiating the renewal of the industry-wide agreement, at least two topics related to digitalisation will be addressed as illustrated in the following section: remote working and the classification of professional profiles.

3.3.3 Trade union approaches and priorities for the collective bargaining agenda on digitalisation

One of the trade unions' current priorities for the collective bargaining agenda on digitalisation is the regulation of remote working and the related issues, such as the right to disconnect, work-life balance, privacy issues and surveillance of workers. Another priority is the change in the classification of professional profiles, which is linked to digitalisation processes, although indirectly.

An agreement on remote working has recently ⁽²⁶⁾ been signed in Enel and, given the role of this company in the sector, this agreement will probably influence the collective bargaining at industry level. The key values which are recalled in and guided the agreement are:

- 'consolidation of leadership open to discussion, sensitive to people's well-being, results-oriented, leaving wide freedom and delegation to workers in line with Enel 'Open Power' values: trust, responsibility, innovation and proactivity;
- voluntary participation in remote working;
- prevailing role of the company headquarters as a meeting place for activities [...];
- strengthening of good practices aimed at better protecting work-life integration, including digital disconnection;
- development of the transversal skills and abilities necessary to face the challenges of the future and to enhance workers' talent;
- inclusion as a driver to ensure the success of transformation focusing on the individual [...];
- attention to people's needs, both during on-site activities and when remote working;
- intensification of social dialogue as a tool for activating change.'

25. https://www.gse.it/documenti_site/Documenti%20GSE/Societ%C3%A0%20trasparente/Personale/Contrattazione%20collettiva/Rinnovo%20Contratto%20Collettivo%20Nazionale%20di%20Lavoro%20per%20i%20Lavoratori%20Addetti%20al%20Settore%20Elettrico.pdf

26. Signed on the 21st of March 2022.

The agreement then sets out a maximum number of working days per month that can be conducted remotely. It establishes that remote working must be voluntary and contains a set of rules to ensure the right to disconnect and the right balance between working times and personal life.

Another priority for the collective bargaining agenda on digitalisation is the change in the classification of professional profiles. This aspect is indirectly linked to digitalisation and is very important. Through digitalisation processes and the transition towards renewable energies, the competencies in the sector are changing rapidly, and so are workers' professional profiles. Technical and technological instruments are changing rapidly, new competences are required, so trade unions are trying to reflect and accompany this evolutionary process in the industry-wide agreements, in order to evaluate the emerging profiles properly from an economic perspective and to capture emerging needs and rights.

It is important to point out here that on 29 March 2022, a new agreement was signed between the unions (Filctem-Cgil, Flaei-Cisl and Uiltec-Uil) and Enel, the largest company in the sector, called 'Statute of the Person' ⁽²⁷⁾, addressing a wide range of key issues related to the quality of work and workers' well-being. This agreement states that 'to support the green and digital transition, enhance innovation, economic growth, promoting economic and social inclusion and guaranteeing quality employment, the Parties encourage the implementation of programs to improve existing skills to access courses to advance professionally (upskilling) and learning new ones (reskilling), also enhancing transversal skills and soft skills, in collaboration with the dedicated bilateral bodies. [...] The enhancement of individual training as a subjective right of the person has constituted a fundamental point of the latest renewal of the national collective bargaining agreement for the electricity sector, as a strategic lever for addressing the challenges of the energy transition and digital innovation.' Moreover, showing considerable openness towards workers' families and suppliers, the agreement also contains the following idea: 'With a view to sharing and generous openness to the outside world, the Parties agree on the opportunity to make available to people outside the company (e.g. family members of employees, employees of contractors and their children) the rich schedule of corporate digital training, through the creation of 'open learning' platforms in which enabled users will have the possibility to benefit from a vast list of training contents on various topics such as safety, languages, energy transition, respect for the environment and biodiversity, circular economy etc., also in order to extend the new culture to the entire Enel ecosystem and creating opportunities for integration into the Company.'

Specific workers' rights linked to digitalisation-related issues can also be found in the 'Statute of the person' signed in Enel. Rights to information and consultation related to digitalisation

27. <https://www.filctemlazio.it/file/enelprotocollocontrattazioneinclusivastatutodellapersona.pdf>

processes have been addressed in both general and specific terms, as we can see from the following quotes.

'Tools and forms of active participation and involvement of people - valuing subjectivity, professionalism, inclusion, accountability and sharing of results and objectives - act as an incremental factor of individual well-being and at the same time organisationally and collectively. Likewise, the enhancement of the collective dimension, of the active participation of the social parties, of confrontation through an engaging social dialogue, which will find its full expression in the work of joint and constant analysis of the context issues, which the Parties will carry out in the spirit of sharing as wide as possible of strategic and organisational choices, and an essential key to grow and manage the challenges of the future, from digitalisation to the energy and climate transition, from generational challenge to the transition of work.'

'A reasonable right to disconnect, for example, is considered by the Parties to be a lever to help people to protect a healthy balance of private and private life with work, people's well-being and the opportunity to profitably dedicate themselves to their family commitments, interests and passions. It is important to implement a shared set of behaviours on which to base the organisation of work without weakening the corporate mission and objectives, as well as regulating the exercise of the right to disconnect.'

3.3.4 Conclusions on the sector

The last industry-wide agreement was signed in 2019; the bargaining process on renewal of this agreement will start between May and June 2022. The key issues addressed at the time were:

- Specific attention paid to young workers with the introduction of mechanisms that could allow them to accumulate additional resources for their future retirement;
- Introduction of specific measures for cases of harassment or gender-based violence in the workplace (a highly innovative issue addressed for the first time in an industry-wide contract);
- The inclusion in the agreement of companies working on renewable sources of energy with fewer than 25 employees, previously covered by other industry-wide agreements such as those for the mechanical or the trade sector. This would make it possible to have one agreement for the entire electricity sector, thus increasing salaries and improving workers' rights. Moreover, from a strategic perspective, this point was particularly important, as the renewable energy sector is growing and will become more and more important in the future.

The agreement signed in 2019 contained no points specifically linked to digitalisation, while in the current process linked to its renewal there are at least two topics related to digitalisation: remote working and the classification of professional profiles.

One of the trade unions' current priorities for the collective bargaining agenda on digitalisation is the regulation of remote working and the related issues, such as the right to disconnect, the work-life balance, privacy issues and surveillance of workers.

Another priority for the collective bargaining agenda on digitalisation is the change in the classification of professional profiles. This aspect is indirectly linked to digitalisation and is very important. Through digitalisation and the transition towards renewable energies the competencies in the sector are changing rapidly, and so are workers' professional profiles. On 29 March 2022 a new agreement was signed between the unions (Filctem-Cgil, Flaui-Cisl and Uiltec-Uil) and Enel, the largest company in the sector, called 'Statute of the Person'; this addresses a wide range of key issues related to the quality of work and workers' well-being.

Section 3.4 Public administration sector

3.4.1 Collective bargaining in the sector

If industrial relations in Italy's private sector are remarkable because of their voluntary, self-regulated nature, in the public administration sector they are equally remarkable because of the degree to which they are regulated by law and highly structured. Key legislation regulating industrial relations in Italy's public administration include Legislative Decrees 29 of 1993, 165 of 2001 and 150 of 2009 ⁽²⁸⁾. These laws lay out specific rules regarding workplace representation, determination of the representativeness of unions in the public sector and set out which parties may participate in collective bargaining and act as signatories to agreements at various levels. Importantly the 1993 Decree created ARAN, the Italian Agency for the Negotiating Representation of the Public Administration, which serves both as the employer representative in collective bargaining and carries out the critical role of determining which unions may participate in collective bargaining and serve as signatories to collective agreements at each level.

The so-called 'Brunetta Reform' of 2009 limited the issues that were bargainable, while the 2017 'Madia Reform' expanded the perimeter of bargainable issues, while establishing clear boundaries regarding rights to collective bargaining, information and joint examination (Bordogno, 2018).

28. <https://www.aranagenzia.it/lagenzia/laran.html>

As mentioned previously, for the purposes of collective bargaining and labour relations, the public administration is divided into the following bargaining units, each with its own national-level contract, and secondary integrative agreements:

1. Central Functions (ministries, government agencies, compulsory social security)
2. Local Functions (regions, provinces, municipalities)
3. Health Sector
4. Education and Research
5. Presidency Council of Ministers

Between 2010 and 2015, collective bargaining and wages were frozen, justified by then Minister Brunetta by the need to contain costs in the public sector. This freeze was later determined unconstitutional, with collective bargaining resuming in 2017, resulting in an agreement covering the 2016-2018 period, signed in 2018. (Bordogno, 2018) It was during this round of negotiations that the Central Functions were consolidated under one agreement. National-level and supplementary agreements have a duration of three years.

As mentioned, one of ARAN's key roles—defined by the 2001 Legislative Decree—is to certify the representativeness of each union, for the purpose of determining which organisations may participate in and act as signatories to collective bargaining agreements. For each bargaining unit, ARAN periodically certifies, on the basis of data provided by the social partners, which unions pass the minimum threshold of 5% representativeness, determined by the weighted average of dues-paying members in the unit and votes received in the RSU election (workplace representation structure). Those unions who meet the minimum threshold may participate in the national-level collective bargaining process for a given unit. Of the unions that may participate in bargaining, a subset may act as signatories, provided they reach at least 51% in terms of representativeness.

Table 4. Central Functions, Calculation of Representativeness (2021)

Category	Affiliated Confederation	Weighted Average
CISL FP	CISL	23.20%
FP CGIL	CGIL	20.38%
UIL PA	UIL	18.90%
CONFSA UNSA	CONFSA	12.21%
FLP	CGS	8.33%
USB PI	USB	8.14%
CONFINTESA FP	CONFINTESA	6.20%

Source: ARAN.

Table 5. Local Functions, Calculation of Representativeness (2021)

Category	Affiliated Confederation	Weighted Average
FP CGIL	CGIL	34.80%
CISL FP	CISL	27.68%
UIL FPL	UIL	18.23%
CSA Regioni Autonomie Locali	CISAL	8.10%

Source: ARAN.

Typically, the first agreement to be negotiated is the Central Functions national-level agreement, followed by Health, then Local Functions. These national-level agreements also lay the framework for bargaining at the second (or territorial) level, by defining what provisions can be implemented immediately versus those that require further negotiation or joint examination at the secondary level. Since the Central Functions agreement covers multiple ministries and agencies, the second level bargaining is divided into two, with one supplementary agreement covering the specific ministry or agency, and then another for the specific workplace. As we will see, the workplace-level agreement is a key part of union strategy around agile work.

On the union side, in addition to those unions which are signatories to the national-level agreement, delegates elected to the local RSU (unitary workplace representation structure) participate in bargaining on, and act as signatories to, the second level agreement. In addition to these negotiations, which take place every three years, the use of agency discretionary funds is collectively bargained annually by the social partners (e.g., should funds be used for bonuses, wage increases, career progression, etc.?)

3.4.2 Role and importance given to digitalisation in the national industry-wide agreements

On January 5, 2022, ARAN, representing the public administration, and the most representative unions signed the 2019 – 2022 Central Functions collective bargaining agreement. Digitalisation plays a central theme in this agreement: in fact, it represents the first attempt in Europe to govern agile and remote work in a national level agreement. Throughout the interviews we conducted, there was no sense that trade unions are acting defensively, simply adapting to the inevitability of remote and agile work. On the contrary, they appear to have embraced these approaches as strategic, in terms of enhancing quality of working life, driving innovation within the public administration, and improving the quality of services. This notion of a potential 'win-win-win', in which workers, the agency and users all benefit from remote and agile work, appears to be driven by the lived experience of the COVID-19 pandemic, in which workers, forced to use new digital tools, were – in some instances – able to move away from a time-based concept of work to a more outcomes-based concept, and create new ways of providing better services, closer to citizens. The hope is, then, that it will be possible to define the concepts of remote and agile work,

and create mechanisms, through collective bargaining and joint examination, that can result in the extension of remote and smart work to, potentially, all employees.

3.4.3 Trade union approaches and priorities for the collective bargaining agenda on digitalisation

One of the over-arching priorities of the trade unions was to move the concepts of remote and agile work out of the niche realm, something that a manager would 'concede' to a worker on the basis of an individual disadvantage (e.g., young children at home), to a place where remote and agile work were considered as equally legitimate ways of working, with respect to traditional office work.

The second element in the trade union strategy was to shift from a notion of 'who is 'smart-able'' to 'what phases or cycles of work' are smart-able. By shifting from positions to activities, the aim is to potentially enable all employees, regardless of their specific role, to benefit from some degree of agile or remote work.

While purely 'agile' work means that employees work toward objectives, without regard to time, the agreement provides protection regarding the number of hours in a day or week that someone working remotely should be 'contact-able' (without the requirement to provide an immediate response) as well as their right to disconnect. Both terms are defined with reference to the contractually defined number of work hours in a day or week (e.g., 36 hours per week). Unions regard both the definition of when someone should make themselves available to be contacted, and when they have the right to disconnect as key protections.

The aim of the national level agreement for the Central Functions is to provide definitions and establish clear guidelines within which remote and agile work can be further negotiated. The agreement envisions this happening at the second level and using, in the words, 'the most advanced instrument we have by law: joint examination ('il confronto'). (INT 6])

Given the innovative nature of the newly negotiated Central Functions agreement with regard to agile and remote work, it would be of benefit to look more closely at the language used, in order to understand the trade unions' strategy.

Agile and remote work are addressed under Title V of the agreement:

- 1) The agreement defines agile work, with reference to law 81/2017, as 'having the goal of improving public service, organisational innovation while guaranteeing work-life balance.' It establishes that remote or agile work does not alter the nature of the employment relationship and guarantees equal treatment to agile and remote workers.

- 2) The agreement extends remote and agile work to all employees, except to shift workers and workers who must 'continuously use specific instrumentation that cannot be used remotely.' Again, the principal is that all employees, to the extent possible, should be able to benefit from remote or agile work.
- 3) The agreement requires a specific, individual agreement to be made with each employee to determine the parameters of the remote or agile work.
- 4) The agreement sets limits on the total number of hours in a day in which an agile worker must be available to be contacted and makes reference to the average number of working hours in a day, as well as providing for the right to disconnect for 11 consecutive hours. During the period of availability, an agile worker has the same rights to time off as any other worker.
- 5) The agreement also calls for workers to be provided with adequate training so as to allow agile workers to experience greater autonomy and empowerment (the words used by interviewees to describe the desired effect of agile work included 'self-management' and 'self-determination').

The agreement also makes a distinction between agile and remote work. Substantively, agile work should be driven by objectives and maximum freedom for the individual worker, while remote work retains many of the features of traditional work arrangements (i.e., time not objectives are key), providing flexibility with regard to *where* the individual worker carries out their duties, but not necessarily to how or what duties to carry out (as in the case of agile work). The section on remote work makes reference to many of the same clauses as for agile work, including the requirement for the arrangement to be voluntary and based on an individual agreement.

As mentioned, the goal of the national-level agreement is to provide a framework and guidelines for determining what activities can be carried out via smart- or remote-working; it delegates the application of these guidelines to second tier bargaining, joint examination and the stipulation of individual agreements.

3.4.4 Conclusions on the sector

It is hard to speak in general about the sector, since significant differences exist between agencies and even between local offices. COVID acted as a catalyst for the widespread adoption of new digital technologies, as employees were sent home *en masse* to avoid contracting COVID but were still required to provide citizens with the same level and quality of services. As the expression goes 'necessity is the mother of all invention.'

As interviews revealed, leadership, employee training and internal capacity all play important roles in the effective adoption of new technologies. Leadership can come from management, labour or

both. Where agencies had already made investments in training, the adoption of digital tools was facilitated. Pre-existing pilot-programmes, which meant there was already some expertise among colleagues, made it easier to expand the use of new technologies that allowed employees to work remotely.

The overarching theme is the question of remote and agile work, with workers' representatives advocating for making these modalities a right of all employees (within certain limits), both as a means of providing greater flexibility to employees but also, potentially, as a way to provide better quality services to citizens when and where those services are needed.

Remote and agile work continue to be contentious issues. In late 2021, following months of forced working-from-home, a Presidential Decree declared in-office work as the 'standard form' of work in the public administration. A follow-up Ministerial Circular re-iterated this premise, while describing the use of remote and agile work as measures to prevent against infection in the workplace (Ministry for Public Administration, 2022). Notwithstanding this resistance to remote and agile work, unions succeeded in introducing both modalities as a right of most employees in the public sector. This sets up both a challenge and opportunity, as the implementation of such work arrangements requires the negotiation of secondary CBAs and, ultimately, the creation of an individual plan, determining work objectives, modality and place(s) of work, technology needed, etc. The opportunity is to massively introduce greater flexibility for employees and experiment with new ways of providing services. The challenge is that successfully implementing these new forms of work will hinge on the ability of social partners, locally, to jointly negotiate these arrangements.

Section 3.5 Hospital sector

3.5.1 Collective bargaining in the sector

Collective bargaining in the hospital sector is governed by the same rules as in the public administration, under the auspices of *ARAN*. Because the Ministry for the Public Administration has ample authority over bargaining in the public sector for hospitals, as throughout the public sector, bargaining was frozen for economic issues between 2011 and 2016. Bargaining occurs at multiple levels, with the national agreement establishing a floor and specifying the specific areas that are bargainable and where, instead, the social partners have the right to information and consultation, or dialogue (*confronto*) at successive levels of bargaining. In healthcare, additional bargaining, along with the negotiation of specific protocols at the local level, play an important role. The rules that govern bargaining in the hospital sector are spelled out in greater detail in section 3.3.1. above.

Table 6. Hospital Sector, Calculation of Representativeness (2021)

Category	Affiliated Confederation	Weighted Average
FP CGIL	CGIL	23.14%
FP CISL	CISL	22.45%
UIL FPL	UIL	18.83%
FIALS	CONFESAL	11.43%
NURSIND	CGS	9.15%
NURSING UP	CSE	8.14%

Source: ARAN.

3.5.2 Role and importance given to digitalisation in the national industry-wide agreements

Typically, the agreement for the Central Functions is negotiated first, followed by healthcare and the local functions. In this regard, the Central Functions agreement sets the tone for bargaining in the other sectors. We will discuss two examples of this dynamic as it relates to digitalisation and healthcare: *Organismo Paritetico per l'Innovazione* and remote/agile work.

The national, collective agreements in the public sector represent both a floor, in terms of wages and working conditions, and a frame with regard to bargaining at the agency, territorial and workplace level—a frame in the sense that the national agreements specify what issues are bargainable at what level. Though not specifically addressed in national collective agreements, digitalisation has become a priority, as is reflected in the creation, as part of the national public sector agreements covering the period 2016-2018, of the Standing Committee on Innovation (*Organismo Paritetico per l'Innovazione*), a type of roundtable at which social partners sit, in equal numbers. The national agreement calls for the establishment of standing committees in agencies with a minimum of 300 employees. The formation of the OPI is an example of the interplay between the three different rights (bargaining, information and consultation, dialogue).

OPI was established through the collective bargaining process in 2018, at the time of the renewal of the 2016 – 2018 agreement. OPI was set up for the purpose of creating a 'new relational model, with the goal of encouraging the participation of unions... in everything that has to do with new, complex, experimental projects that impact the organisation of the administration...' (29) Members of the local OPIs have the right to information and consultation, to engage in dialogue around the implementation of specific changes, and have the ability to propose changes or topics for future collective bargaining.

29. <https://www.cnel.it/Amministrazione-Trasparente/Personale/Organismo-paritetico-per-linnovazione-OPI>

Finally, as part of the latest agreement for the hospital sector, in line with the Central Functions agreement, workers in this sector enjoy the same rights to remote and agile work as those defined in the public administration agreement, using the same modalities as those outlined in that agreement.

3.5.3 Trade union approaches and priorities for the collective bargaining agenda on digitalisation

Unions in Italy, along with regional governments, have traditionally been among the strongest proponents of developing and strengthening the National Health Service, and interpret their role as serving a dual function: protect and advance the interests and rights of workers alongside the interests and rights of citizens to free, high-quality healthcare. Regarding the role of unions and collective bargaining as it relates to digitalisation and organisational change, one interviewee summed it up like this: collective bargaining is the real value-added... because managers and trade unionists were far-sighted. They looked to the healthcare of the future... they invested in the development of organisational models... this is how we addressed major challenges like the pandemic, organisational changes, structures, skills and capacity. The bargaining table is forward looking...' (INT 9).

Unions are keen to influence and govern the implementation of new technologies, a task rendered more difficult by the exclusion of work organisation as a bargainable item by the reform of bargaining in the public sector. In the local contexts where there is a strong history and culture of social dialogue, this has had little impact on the ability of unions to negotiate changes impacting work organisation. As an example of labour relations' ability to govern technological changes, one leader interviewed, from Emilia-Romagna, cited the consolidation of several emergency call centres into one centre. Through joint examination, employee representatives were able to achieve important changes to the design of the new centre, and influence work organisation: an example that leaders were particularly proud of. Despite the formal exclusion of work organisation from bargaining, 'politically in Emilia-Romagna you are not excluded from issues of work organisation.' (INT 12).

Still, leaders are open about the challenges posed by new technologies to the unions' agendas: 'the risk is that the complexity and specificity of the material leaves the union at a disadvantage.' As a result, unions tend to focus on the 'systemic level,' negotiating on 'organisational systems' rather than specific technologies.' (INT 12)

3.5.4 Conclusions on the sector

The healthcare system in Italy has been particularly impacted by the introduction of new technologies, with more on the way in the coming years. Here, as in the public administration, regional differences impact the adoption and utilisation of new technologies. The quality of industrial relations locally is a major factor in the effectiveness of these new technologies, in terms of how they are adopted and used in the workplace—and who they benefit.

As one of our interviewees put it, the increasing ‘specificity’ and ‘complexity’ of the new technologies is a risk for industrial relations, and in particular for unions, which may lack the expertise to be able to negotiate the adoption and implementation of specific technologies. Yet these technologies increasingly have an impact on the organisation of work, employment and on the quality of services. Unless unions can develop the ability to understand and negotiate the implementation of specific technologies within the workplace – technologies which increasingly impact the ‘organisational systems’ themselves – the risks will only grow.

Section 3.6 Overall cross-cutting sectoral conclusions

To date, industrial relations in Italy have attempted to govern the impacts of these changes through collective bargaining, joint examination (‘confronto’) and information and consultation. Our field research indicates that the degree to which industrial relations have been successful appears to be linked to the abilities of the leadership (management, union or both) and the context within which labour relations exist locally, with significant variation among regions and across agencies and companies. For example, while unions no longer enjoy the right to concertation, the experience of Emilia-Romagna shows how history and culture continue to support an ongoing dialogue and joint negotiation of changes.

Digital transformation, however, appears poised to test the ability of the current system of industrial relations to continue to effectively govern those changes in ways that achieve benefits for workers, users and the organisation. Digital transformation represents a ‘paradigm shift,’ that places unique pressures on organisations to move away from a model based on hierarchy, organisational silos, long-term planning, the fragmentation of job-tasks and visual management, toward a model that is user (citizen) centric, flexible and results-oriented, where top-down management approaches and hierarchical control are replaced by greater horizontal collaboration among workers guided by a shared purpose. (Bacci et al, 2021) Transformation radically changes the ‘way organisations operate and how organisations realise value for customers,’ and demands that organisations rethink how they organise and manage, as well as calling for more holistic thinking. (Grovers and van Almsvoort, 2019.) Finally, new technologies are not neutral: these new technologies reflect the political, social and economic context in which they were developed, and their implementation has an impact on the balance of power and the distribution of resources and

benefits within the workplace and society. How these new technologies are implemented will determine to whom the benefits of these new technologies accrue.

Digital transformation fits the definition of an 'adaptive challenge.' Adaptive challenges place special stresses on leaders (both in management and labour). Effectively responding to these types of challenges requires a shift away from top-down decision making and a reliance on external expertise, toward greater participation in jointly defining the problems and the solutions, as well as direct participation of those most affected by the new technologies in their implementation (Heifetz, et al, 2009). One cannot apply old thinking and ways of working to new technologies and hope to fully realise the benefits, for workers, organisations and users, of those new technologies (Grovers and van Almsvoort, 2019; Ribarova et al, 2022).

Italy has a rich history of using industrial relations and collective bargaining to jointly negotiate changes and monitor their implementation by social partners. Specifically regarding digitalisation, there was the recognition by CGIL, Italy's largest labour confederation, of the need to 'negotiate the algorithm,' implying the need for unions to develop deeper expertise in the specific types of digital technologies affecting work. We see this history reflected in the case studies as well, for example the inclusion of a right to remote and smart work in the new public administration agreements, the creation of bi-lateral commissions for addressing and monitoring changes that impact work organisation, the negotiation of the Statute of the Person in Enel. However, as in other EU countries, there is much less experience of *joint implementation*, at the level of the workplace, through direct worker participation in specific changes (Ribarova et al, 2022). Research, however, points to the need for a major shift in roles in terms of direct participation in the adoption and implementation of new technologies in the workplace. This would require a shift in thinking among unions and management regarding the role of industrial relations in implementing specific changes at the workplace level. (Guidelines for Good Practice of Direct Participation; Bacci et al 2021.) This may be the adaptive challenge of the digital era.

While unions are understandably concerned about loss of autonomy and of their role as collective representatives of workers, as a consequence of direct participation schemes, there is also a risk associated with not promoting such an approach: as digital technologies impact work more and more, unions may risk being seen as being unable to govern the implementation of these technologies for the benefit of workers and users. Some evidence for this view is provided by the DGQS survey—especially in the public administration and hospital sectors, sectors in which unions nationally have made governing the impact of digital tools a high priority. Participants were asked if formal information and consultation procedures were followed 'when planning and designing the digitalisation of work processes and tools at your workplace' regarding 'the process of digitalisation and its implementation strategy.' 30% of public administration respondents said 'I don't know,' while 48% said 'no, such procedures were not followed.' In healthcare, 45% responded 'I don't

know' and 37% responded 'no, such procedures were not followed.' In the electricity sector, 41% said 'I don't know' and 19% said 'no, such procedures were not followed' in response to the same question.

Respondents were also asked 'In your view, how effective has the trade union been in negotiating the socially sustainable management of digitalisation and technological change' in the workplace. 26% of public administration respondents said: 'I don't know,' while 23% said 'not effective at all.' Among healthcare respondents, 36% said 'I don't know' and 18% said 'not effective at all.' (In the electricity sector, on the other hand, 70% of respondents saw the union as moderately to highly effective in this regard.)

As the pace of digital transformation picks up in the coming years, there is the risk that perceptions such as these, that unions are unable to govern these changes, may only increase, further disadvantaging labour. There is also, however, ample research to support the view that direct worker participation in implementing changes in the workplace, in the context of robust, collaborative labour relations, can improve outcomes for workers, organisations and users, as well as strengthening the role of unions as collective representatives of workers' interests (Ribarova, 2022; Rubinstein and McCarthy, 2016).

By experimenting with new ways of joint problem-solving and decision making, and continuous, direct participation in the workplace, leaders can tackle the adaptive challenge presented by digital transformation, to the benefit of workers, organisations and citizens, while strengthening the role and ability of unions to collectively represent the interests of workers.

SECTION 4. RECOMMENDATIONS TO NATIONAL AND EU STAKEHOLDERS

Section 4.1 Recommendations to national stakeholders

As we have seen, the nature of the changes being wrought by digitalisation are both profound, and sweeping. And because the social, political and economic context within which new technologies are developed and implemented has an impact on the balance of power within the workplace and society, the benefits of digitalisation are matters for contention. This reality, the non-neutrality of technology, opens up possibilities of both increasing conflict in industrial relations, as well as increasing collaboration.

Ensuring that the benefits of new technology accrue evenly across society, and particularly include workers, will require new levels of awareness and understanding of digitalisation, new skills, approaches to bargaining that include the entire value chain, and the joint governance of change, including at the level of the workplace. Below, we flesh out in more detail specific proposals that can help ensure that digitalisation brings benefits to workers, as well as to users and organisations/companies.

Awareness & Training

Across the sectors studied in this report, through interviews, focus groups and the DGQS survey, a greater need for training became clear. Workers, managers and union delegates should receive a foundational level of training that: 1.) raises awareness about the nature of technology-driven change in general (including and especially the non-neutral nature of technology) 2.) provides training in digital literacy and numeracy 3.) enhances relational and team-building skills 4.) trains participants in change management. This suite of skills is required so that individuals, teams and organisations can make conscious choices about how best to implement new technologies, including understanding the impacts on work organisation, quality of work and quality of service. It is important that training be ongoing (life-long), and experiential (Ceccotti, 2023). Ongoing training of this kind will benefit unions in their ability to understand digitalisation and to represent workers effectively, as well as workers and management. Finally, workers should have a right to lifelong training.

Including the Whole Value Chain

Digital technologies break down and blur boundaries between roles and organisations, and also enable greater use of outsourced labour and sub-contracting. Because of these dynamics, it is essential that labour strategies take into account the entire value chain, and not simply traditional actors. We see examples of this especially in the electricity sector, where unions have successfully included smaller start-up firms (active in particular in renewables) in the industry-wide collective bargaining agreement.

Governing Change

Digital technologies are introducing radical changes into organisations and whole industries, affecting processes, work organisation, the quality and quantity of employment, wages, and health and safety. These new technologies are also redefining and blurring boundaries, between roles, organisations and industries, and between user and producer (not for nothing is this era referred to as the 'fourth industrial revolution'). These profound changes, combined with the acknowledgement that technology is not neutral (socially, politically, economically) brings a need to strengthen the ability of social partners, and unions in particular, to collectively govern these changes. It is in this spirit that we offer the following recommendations:

1. **Legal and Regulatory Framework:** The appropriate legal and regulatory framework should be created to ensure that new technologies put people at the centre, including criteria for the use and development of algorithms, AI and other technologies; regulation should ensure that the public sector does not become dependent on a narrow set of private-sector solution providers; regulation should also require social dialogue regarding the ends (intents) of adopting new technologies, and joint negotiation around their implementation. Social partners should actively monitor the impacts of new technologies and have viable enforcement mechanisms when the impacts stray from the agreed-upon intents; new technologies, and their implementation, should comply with the rights of workers as outlined in the Workers' Statute.
2. **Expertise:** Unions need to have the required expertise to understand and independently develop positions on the use of specific technologies. During negotiations, unions should have access to subject-matter experts so that they can effectively represent workers' interests based on their independent view of technologies. Joint bodies (bi-lateral commissions, standing committees, etc.) should have the support of subject matter experts that social partners view as legitimately independent to help them make informed decisions. Initiatives such as the development of the CGIL initiative 'Labour 4.0' and the Forum on the Digital Transition are important steps in this regard ⁽³⁰⁾.
3. **Training:** The deep and wide-ranging impacts of technology, along with its specificity and complexity, require significant investments in training, not just for workers but also for their representatives and other social partners. Training should provide broad awareness of the kinds of technologies affecting work, with an emphasis on the non-neutral nature of technology and the choices available to social partners regarding the selection of new technologies and their implementation. Union delegates and managers should also receive training in new forms of technology-enabled work organisation, including best practices for implementing remote and agile work arrangements (it is clear that so much of the

30. <https://www.collettiva.it/speciali/idea-diffusa-1-2023/>

implementation of unions' vision for remote and agile work will depend on the abilities of managers and delegates at the local level).

4. Encourage joint implementation and monitoring of changes in the workplace:

Industrial relations should encourage direct worker participation in the selection and implementation of new technologies, especially when employment, job quality and work organisation are likely to be impacted. Direct participation should be encouraged, not as the unilateral prerogative of management, but as an extension of collective representation and existing union efforts to jointly govern the impact of changes on workers and work organisation. One such model is the Joint Union Management Steering Committee (JUMSC), proposed by the EU funded project DIRECT 2: Expanding and Improving Workplace Democracy as a Prerequisite for Humanising Labour and the Work Environment (<https://2.direct-project.org/library/english/84-guidelines-for-good-practice-of-direct-participation>). It should be noted that such joint management-labour structures are not a substitute for conflict, collective bargaining or the role of unions as workers representative, but an extension and deepening of existing practices into the workplace. Such an extension seems necessary, given the nature of the sweeping changes impacting work and to ensure that the benefits of those changes accrue to workers.

Section 4.2 Recommendations to European stakeholders

Stakeholders at the European level have an important role to play in supporting the ability of social partners nationally to jointly govern the impacts of digitalisation. In particular, stakeholders should advocate for the development of appropriate legal and regulatory frameworks within Member States, funding for training and awareness building around technology-driven change and should promote cross-border collaboration and learning through the creation of communities of practice. Finally, EU stakeholders should advocate for ongoing research into digitalisation and its impact on work and society so that stakeholders' understanding and ability to jointly govern changes keep pace with the changes themselves.

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Annex 1. List of interviews

ID	Gender	Institution	Sectors	Position	Date	Method
INT 1	Male	Flaei Cisl Reti	CISL/Electricity	Secretary	7/3/22	Zoom
INT2	Male	UILPA	UIL/Central Functions	Delegate	1/3/22	Zoom
INT3	Male	ILCTEM	CGIL	Functionary	4/5/22	Zoom
INT4	Male	FILCTEM	CGIL/Electricity	Secretary	28/03/22	Zoom
INT5	Male	FILCTEM	CGIL/Electricity	Secretary	28/03/22	Zoom
INT6	Male	FPCGIL	CGIL/Central Functions	Secretary	23/02/22	Zoom
INT7	Female	FPCGIL	CGIL/Local Functions	Secretary	17/03/22	In Person
INT8	Male	FPCGIL	CGIL/Central Functions	National Coordinator	25/03/22	Zoom
INT9	Female	CGIL	Emilia-Romagna Region	Functionary	21/10/22	Telephone
INT10	Male	Emilia-Romagna Region	Health and hospitals	Worker	15/11/22	Teams
INT11	Male	Emilia-Romagna Region	Health and hospitals	Worker	15/11/22	Teams
INT12	Male	FPCGIL	CGIL/Healthcare	Secretary	17/11/22	In Person

Annex 2. List of focus groups

Public administration

ID	Gender	TU affiliation	Sector	Occupation
FG1	Female	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Local Functions	Functionary
FG2	Female	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Local Functions	Employee IT Services
FG3	Male	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Central Functions	Functionary
FG4	Female	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Central Functions	Employee
FG5	Female	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Central Functions	Social Worker
FG6	Male	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Local Functions	Functionary
FG7	Male	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Central Functions	Employee
FG8	Male	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Central Functions	Employee
FG9	Male	FPCGIL (Funzione Pubblica – Confederazione Generale Italiana del Lavoro)	Healthcare	Administration

Electricity sector

ID	Gender	TU affiliation	Sector	Occupation
FG1	Male	FILCTEM CGIL (Federazione italiana lavoratori della chimica, tessile, energia e manifatture - Confederazione Generale Italiana del Lavoro)	Chemistry, Textile, Energy, Industries	Electrician
FG2	Male	FILCTEM CGIL (Federazione italiana lavoratori della chimica, tessile, energia e manifatture - Confederazione Generale Italiana del Lavoro)	Chemistry, Textile, Energy, Industries	Electrician
FG3	Male	FILCTEM CGIL (Federazione italiana lavoratori della chimica, tessile, energia e manifatture - Confederazione Generale Italiana del Lavoro)	Chemistry, Textile, Energy, Industries	Electrician
FG4	Male	FILCTEM CGIL (Federazione italiana lavoratori della chimica, tessile, energia e manifatture - Confederazione Generale Italiana del Lavoro)	Chemistry, Textile, Energy, Industries	Electrician
FG5	Male	FILCTEM CGIL (Federazione italiana lavoratori della chimica, tessile, energia e manifatture - Confederazione Generale Italiana del Lavoro)	Chemistry, Textile, Energy, Industries	Electrician