Impact of the Content of Collective Agreements on Changes in the Nature of Work, in Qualification Requirements and in Occupational Safety, in Connection with Digitalisation and Robotics

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Introduction

Globalization that facilitates and accelerates the movement of goods, people and capital. Thanks to it, the ever-increasing competition comes not only from traditional countries, but also from other countries, such as the 'Asian Tigers'. Rapidly growing consumer demand for custom manufacturing. A dynamic market environment in which periods of economic growth alternate more and more often with periods of recession. All this is a list of the most important features that characterize today's business environment. If a company wants to succeed and prosper in such an environment in the long run, it must focus, among other things, on digital transformation, automation, robotics, and on investment in modern technologies in general.

The introduction and use of modern technologies bring unquestionable benefits for companies and their employees. Overall, they enable companies to be more competitive and meet the needs and wishes of customers within the necessary time without sacrificing goals in terms of cost, quality, reliability, etc. They bring higher productivity, better working conditions, new ways of organizing work or better quality of services and products, etc.

Therefore, with the vision of greater competitiveness, a large number of companies would like to use the potential of these technologies. However, what brings advantages usually has its limitations and disadvantages. Moreover, profits are never automatic. Insufficient preparation for the introduction and use of modern technologies can have a significant impact on employees, one of the most important corporate resources. As a result of insufficient training, working conditions, occupational health and safety, the quality of work and thus private life may be endangered or, in the worst cases, employment may be endangered.

In this context, there is a need for a joint commitment on the part of employers, employees and their representatives both to make the most of opportunities and to best meet the challenges that modern technology brings to the world of work. [1] One way to achieve this is to adapt collective agreements and, where appropriate, other related documents accordingly.

The study presented here also responds to this need, the aim of which is, on the one hand, to define the key areas that should be addressed in collective agreements and related documents from the point of view of employees. On the other hand, the aim is to present possible measures to deal with potential problems and risks in collective agreements and related documents, and to present good practice examples.

The first chapter presents collective bargaining in its current state within the Czech Republic. It describes the status of employee membership in trade unions and their coverage under collective agreements. Furthermore, the chapter outlines the process of collective bargaining and its legislative framework.

The second chapter of the study focuses on a brief summary of the main expected impacts of digitalisation, automation, robotics (the introduction of modern technologies in general) and other simultaneous factors on work, working conditions, work organization, etc. The purpose is

to realize the significance of the changes that are taking place and will take place, and thus to understand the importance of this study and the need to protect workers.

The third chapter deals with key measures of collective agreements in connection with the introduction of modern technologies. It points out the need to set up the right implementation process, including the importance of employee engagement. There are also good examples from different countries, such as Spain or France, and from different sectors of the economy, such as the engineering industry or public services. Finally, the reader is acquainted with the key findings of the German project 'Work 2020', which can be in many ways inspiring for setting the content of collective agreements.

The fourth chapter addresses measures, principles and rules concerning the protection of specific working conditions. These are education, working conditions (OSH, ergonomics, etc.), work organization, remuneration, cyber security, employee control and data collection, threats to social contact and disadvantaged groups of workers. Some areas are again supplemented by good practice examples.

The penultimate chapter discusses the necessary measures, principles and rules to protect workers using new forms of employment, such as digital platforms. It provides good examples of how they have dealt with this relatively new phenomenon in other countries.

The last chapter mentions the importance of sustainable development. The purpose is to realize that the protection of employees must be set up in the right way so that the competitiveness of a company is not endangered and there are no negative effects on the economy and the labour market.

1 Collective bargaining

Social dialogue, whether at the state or company level, is one of the tools to help balance labour market mismatches and prevent polarization. The results of company collective bargaining between the employees' representative (trade unions) and the employer are also valid at the company level for employees who are not members of a trade union. Likewise, thanks to higher-level collective agreements, the results of collective bargaining are extended to the entire sector. Although the results of collective bargaining concern a large proportion of employees, only a small proportion of them actively participate in collective bargaining in the form of representatives. It is not only about the size of the group represented, but also about its stability, which serves to ensure an equal partnership in the social dialogue. Therefore, this chapter will focus on the trade union engagement of Czech employees and developments in this area, as well as the expansion of collective agreements and their importance. An equally important part of the chapter is the legislative picture of collective bargaining itself.

1.1 Trade union membership

Czech society - like the entire Czech economy - underwent significant changes in the early 1990s. This transformation of society and the economy was reflected in the area of collective bargaining and in the attitudes of the Czech population, and therefore of Czech employees, to social dialogue. With the transformation came a change in the approach of Czech employees to trade union engagement or active participation in collective bargaining. Figure 1 clearly shows a decrease in trade union members by more than 2.3 million over 25 years. After a steady decline, we can observe a constant value of 500,000 employees who are members of trade unions in recent years.

The second view in Figure 2 shows the related declining level of engagement of Czech employees, when almost 7 out of 10 employees were members of a trade union in the early 1990s, it was only every second two years later, only 20% of employees in the next 10 years in 2005 and we are currently approaching 10%.

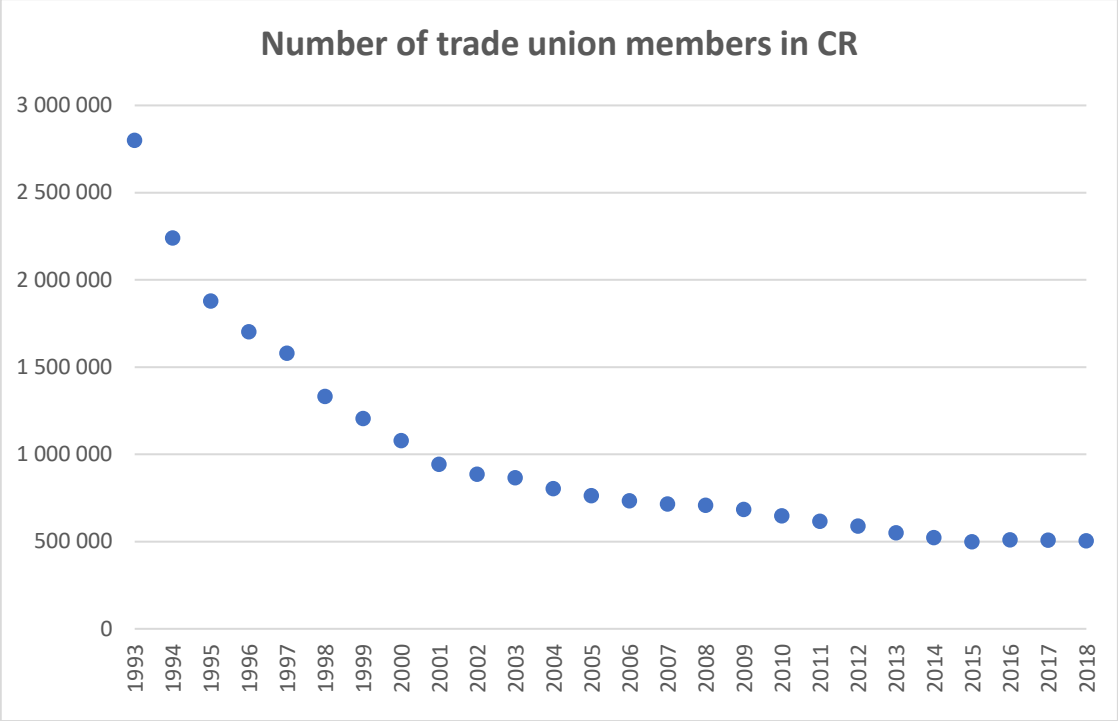


Fig. 1 Number of trade unions members in the Czech Republic in 1993-2018 (OECD, own adaptation)

There are several reasons why there has been a rapid decline in trade union members and trade union engagement. Trade union engagement in the Czech Republic is affected by, for example, the following factors:

- A level that is dominant in terms of collective bargaining. Bargaining at higher levels is associated with higher trade union engagement [1], and trade unions are not under pressure of rapid shrinking of membership base [2].
- Development of the population from which the membership base can be established. In this respect, demographic development in particular plays a key role, with trade unions having to resolve the conflict between the interests of the younger and older generations. These interests are often contrary and demotivate the younger generation in terms of trade union engagement, as they may feel that organizations do not represent them sufficiently compared to older employees [3].
- Unemployment also plays a major role. High unemployment can lead to a reduction in the number of employees who can join trade unions, but mainly strengthens the position of employers during the unfavourable development of unemployment [4].
- Adverse economic development. Economic crisis may accelerate the decline in trade union membership in countries where collective bargaining does not have adequate legislative support and is not considered one of the tools to address labour market problems [1].
- The change in the structure of the economy, which manifested itself in the transformed economy mainly by:
    - a change in the sectoral structure of the economy, by moving away from traditional sectors and moving towards services,

- increased emphasis on entrepreneurial activity and an increase in the number of entrepreneurs - employers,
- higher number of economic entities with a low number of employees (especially micro-entities).

The changes in the structure of the economy described above have been further amplified in recent years by new trends in the labour market, which are closely related to the digitalisation and automation of the economy. Changes in the labour market are rapid and it is often difficult to enshrine them in legislation. The advantages and disadvantages associated with a higher degree of digitalisation - and thus flexibility - are also reflected in the relationship of employees to collective bargaining, which may not respond to new phenomena at the required speed. The next chapters deal with this issue in more detail.

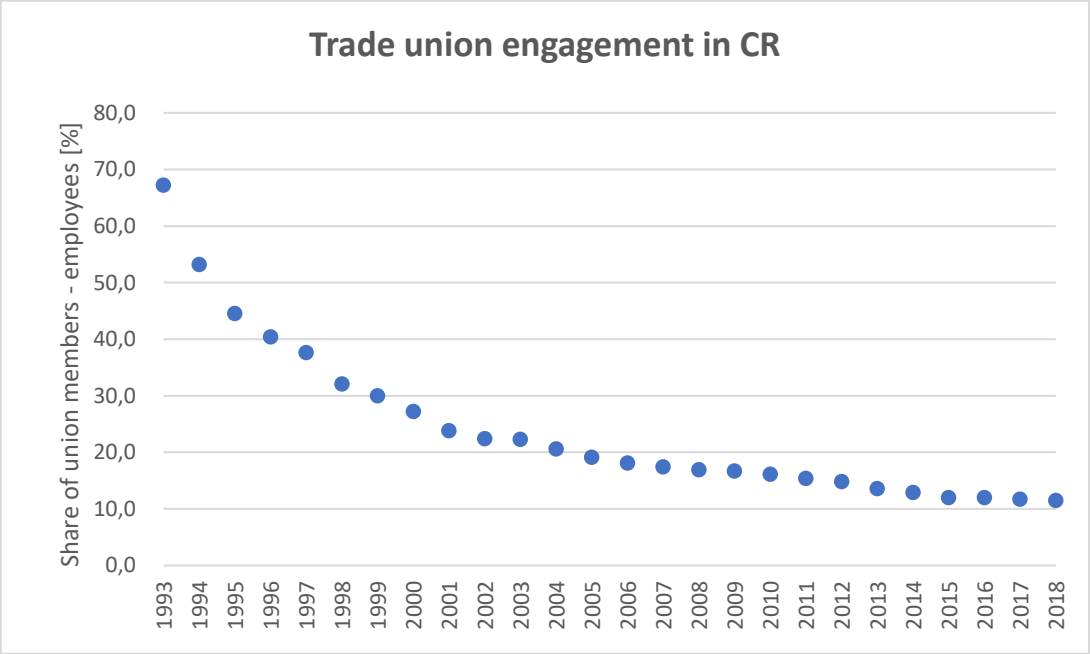
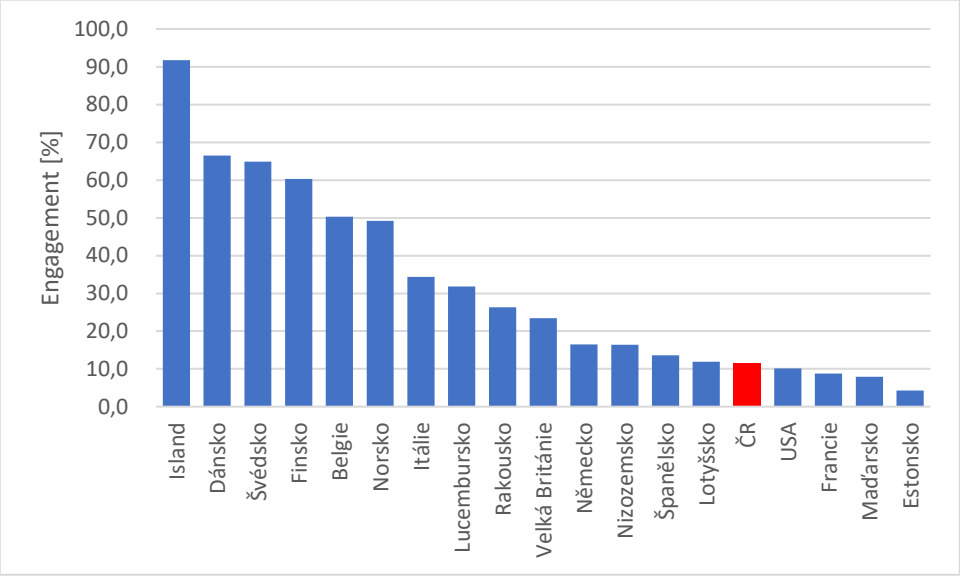


Fig. 2 Trade union engagement of employees in the Czech Republic in 1993-2015 (OECD, own adaptation)

All the above factors contributed to the fact that the trade union engagement of employees in the Czech Republic has similar characteristics as in other developed countries. Although there was an enormous decrease in the trade union engagement of employees in the last 30 years, the share of employees - union members remains at a similar level as in the Visegrád Four countries (see Figure 3). Thanks to this, we can see that it is not a disturbing development within the Czech Republic, but that engagement is declining across countries.

Figure 3 further indicates that there are large differences between countries in terms of union engagement of employees. Employees are most often union members in Iceland (90% of employees are also union members), Sweden (67%), Denmark (65%), Finland (65%), Belgium (54%) and Norway (52%). More than half of the employees joined a trade union in all these countries.

Most of these countries (Sweden, Finland, Denmark and Belgium) belong to the countries with the Ghent system [5]. Under this arrangement, trade unions have tools at their disposal that implicitly support high trade union engagement. Trade unions here have part of the obligations of the social system related primarily to the payment of unemployment benefits. Unemployment benefits are often linked to the condition of membership in the system. The decision of a particular employee whether to become a trade union member or not is both based on their beliefs and economically motivated.



Island,Denmark,Sweden,Finland,Belgium,Norway,Italy,Luxembourg,Austria,Great Britain, Germany, The Netherlands, Spain, Latvia, CR, USA, France, Hungary, Estonia

Fig. 3 Trade union engagement of employees in an international comparison in 2018 (OECD, own adaptation)

1.2 Coverage by collective agreements

The number of union members may not be directly proportional to the extent of the impact of collective bargaining on a company, because, as mentioned above, collective bargaining results are valid at company level for all employees regardless of their union membership and because they affect entire sectors in case of higher-level collective agreements. For this reason, the following section will be devoted to the coverage by collective agreements of economic entities and employees with an emphasis on the identification of employees outside the protection of collective agreements.

1.2.1 Coverage of economic entities

The existence of a collective agreement is an important protective element from the point of view of labour protection of employees at a particular employer. The scope of a collective agreement (whether a company agreement or a higher-level collective agreement) is not a matter of course with all economic entities. In 2018, 22% of economic entities with 10 or more employees were to be governed by a collective agreement. However, as Figure 4 shows, there are large differences between the entities.

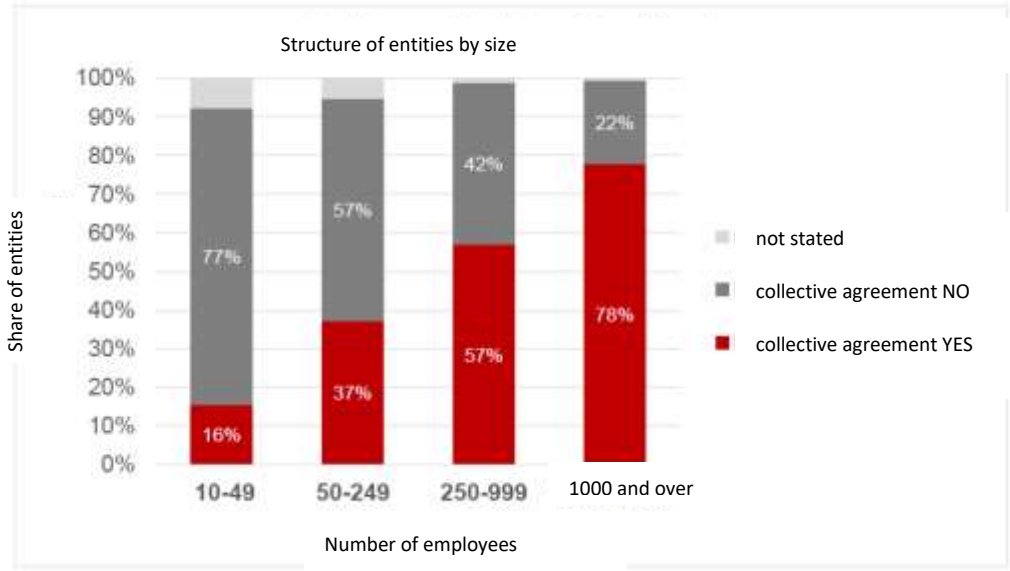


Fig. 4 Existence of a collective agreement in economic entities by size in 2018 (MLSA, Trexima adaptation)

While most companies have to comply with a collective agreement in the group of the largest economic entities, this obligation applies to only one-sixth of them in the group of entities with 10-49 employees. However, the coverage by collective agreements is to a large extent affected not only by the size of an economic entity, but also by the affiliation of an economic entity to the wage or salary sphere (see Figure 5).

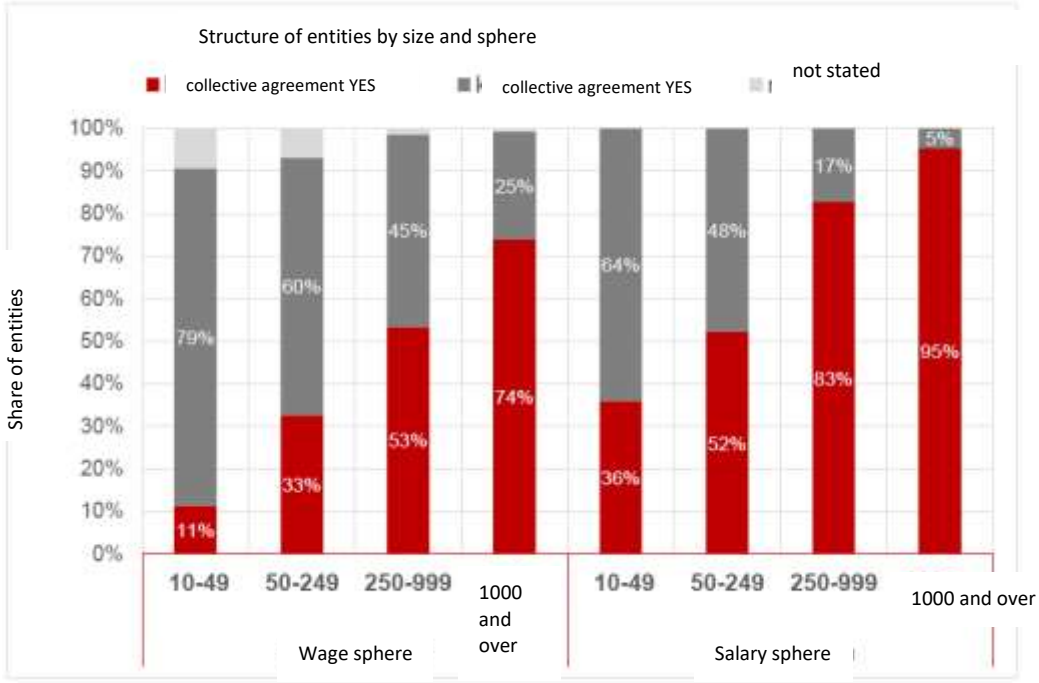


Fig. 5 Existence of a collective agreement in economic entities by size and sphere in 2018 (MLSA, Trexima adaptation)

It is clear from the above figure that the coverage by collective agreements is denser in the group of economic entities in the salary sphere in all size categories. Economic entities that remunerate

their employees in accordance with Act No 262/2006 Coll., the Labour Code, are thus much more often bound by the provisions of a company collective agreement or a higher-level collective agreement.

In addition, economic entities show different variability in individual sectors in terms of size structure. The high share of the smallest economic entities in some sectors may worsen the overall situation of the sector in terms of coverage by collective agreements, as it is the smallest entities that are least covered by collective agreements. As illustrated in Figure 6, collective agreements usually cover entities in the following sectors:

- agriculture, forestry and fishing (section A of the CZ-NACE classification),
- mining and quarrying (section B), and
- transport and storage (section H),

thus in traditional, better organized sectors.

Conversely, fragmented sectors with a high proportion of small economic entities are covered the least, such as:

- wholesale and retail trade, repair and maintenance of motor vehicles (section G),
- accommodation, food and hospitality (section I),
- administrative and support service activities (section N),
- other activities (section S),

or new, fast-growing sectors such as:

- information and communication activities (section J),
- finance and insurance (section K), or
- professional, scientific and technical activities (section M).

Lower coverage of progressive sectors is one of the consequences of changes in the structure of the economy, taking place as a result of the growing digitalisation and automation of the economy. These sectors are characterized by a larger number of newly established, smaller economic entities in which the concentration of trade unions is lower. A higher-level collective agreement is not concluded in these sectors, which is, among other things, a consequence of the large individualization of progressive sectors in terms of the focus and scope of work of individual entities. Individualism thus manifests itself not only at the level of employees, but also at the level of economic entities.

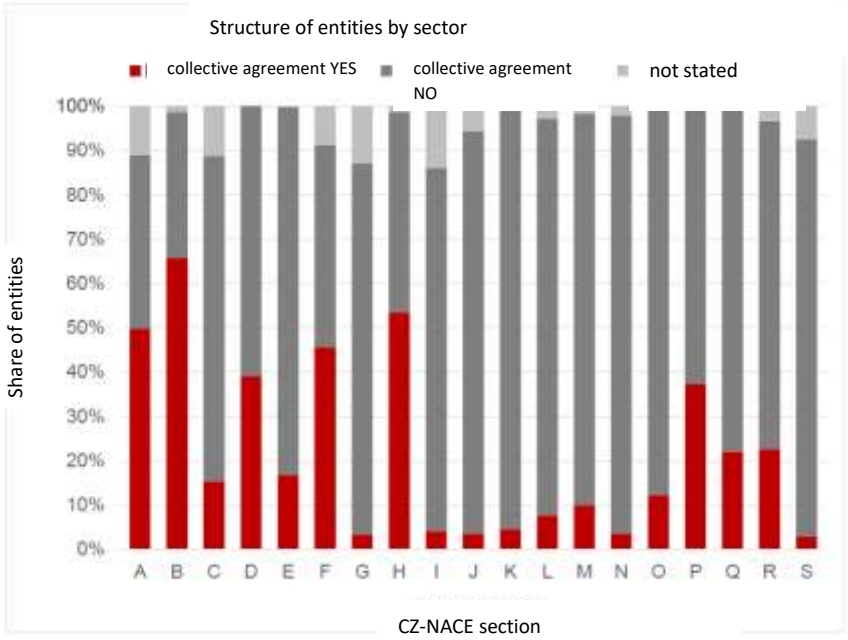


Fig. 6 Existence of a collective agreement in economic entities by sector (MLSA, Trexima adaptation)

1.2.2 Employee coverage

In addition to monitoring the share of economic entities for which compliance with the collective agreement is binding in fulfilling their economic objectives, it is important to monitor the share of employees whose employer must comply with the provisions in a company collective agreement or in a higher-level collective agreement. With regard to the heterogeneous structure of economic entities by size (see Figure 4), it is logical that employees will be covered by collective agreements to a much greater extent. In 2018, 44% of employees in the Czech Republic were covered by collective agreements (see Figure 7).

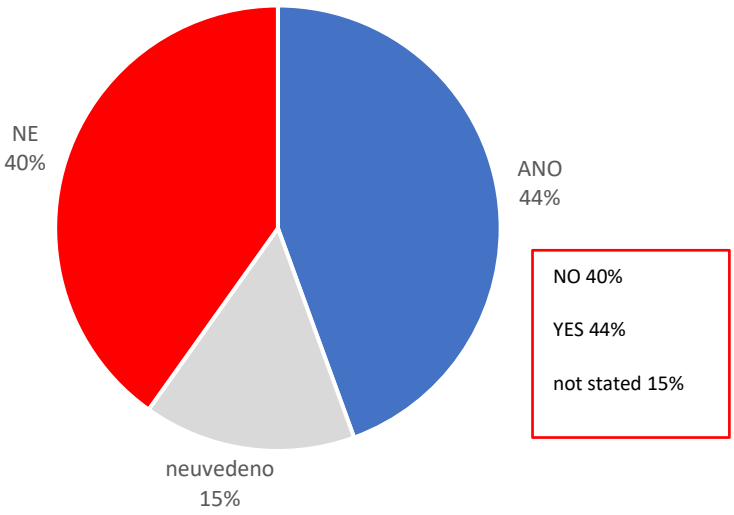


Fig. 7 Coverage of employees by collective agreements (structure of employees according to the existence of a collective agreement in a company) (CZSO, own adaptation)

Coverage by collective agreements has shown similar trends as trade union engagement since the early 1990s (see Figure 2). Almost three quarters of employees were covered by a collective agreement at the beginning of the 1990s, however, the coverage of the employee population by collective agreements gradually decreased, reaching its lowest level in 2001. This year, only 38% of employees on the Czech labour market were covered by the collective agreement. The structural changes related to the transformation of the Czech economy became fully apparent during the 1990s. The level of coverage of employees by collective agreements has gradually stabilized in the new millennium, with the share of employees protected by the results of collective bargaining oscillating between 40 and 50% (see Figure8). While the engagement within the Visegrád Four does not differ much, the coverage rate is lower in other countries - the coverage rates for Slovakia and Hungary are between 20 and 30% and between 10 and 20% for Poland.

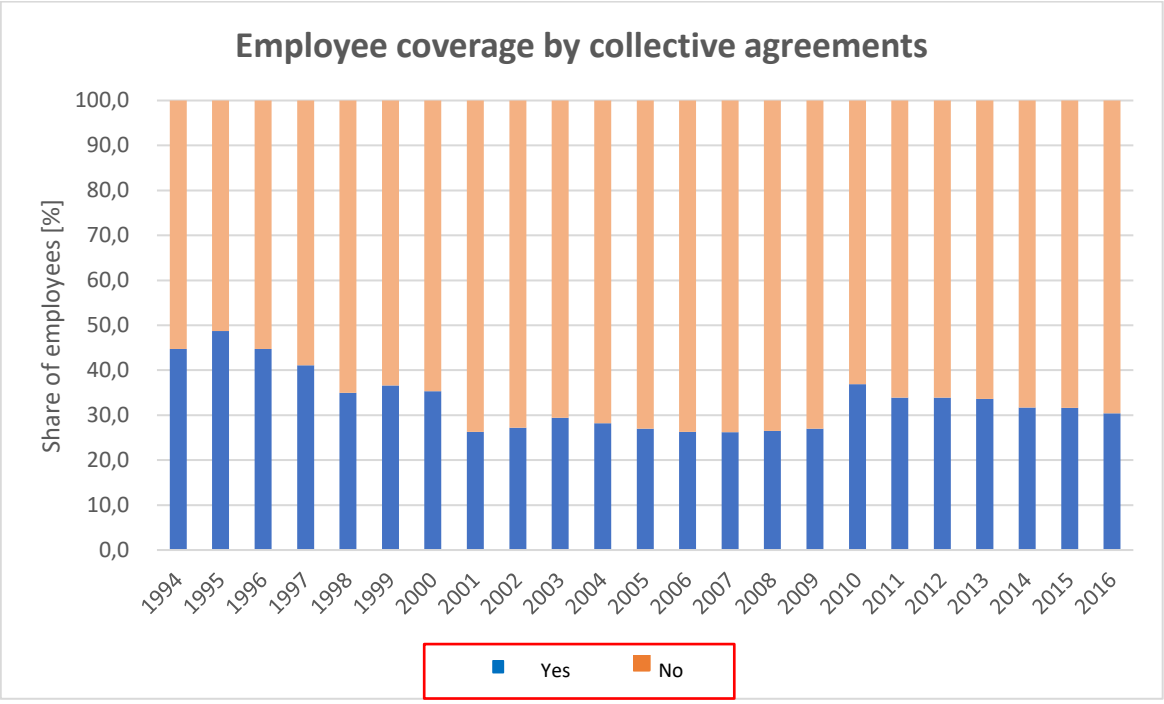


Fig. 8 Coverage of employees by collective agreements in 1993-2015 (OECD, own adaptation)

Gender issues are often mentioned in the context of collective bargaining. Although social dialogue is one of the important tools for achieving a level playing field in the labour market, trade union membership and collective bargaining remain gender unbalanced [6]. Figure 9 indicates that men (46%) are more often covered by collective agreements than women (43%) even in the Czech Republic. Based on this figure, it can be concluded that collective bargaining is targeted at companies and sectors that are more masculine (i.e. characterized by a higher proportion of male employees).

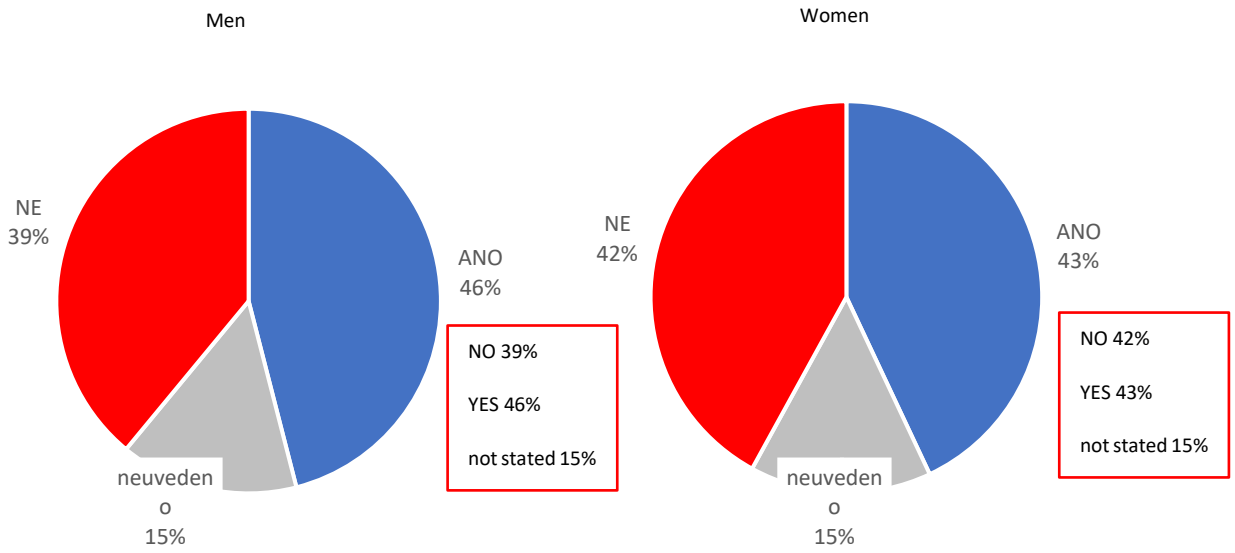
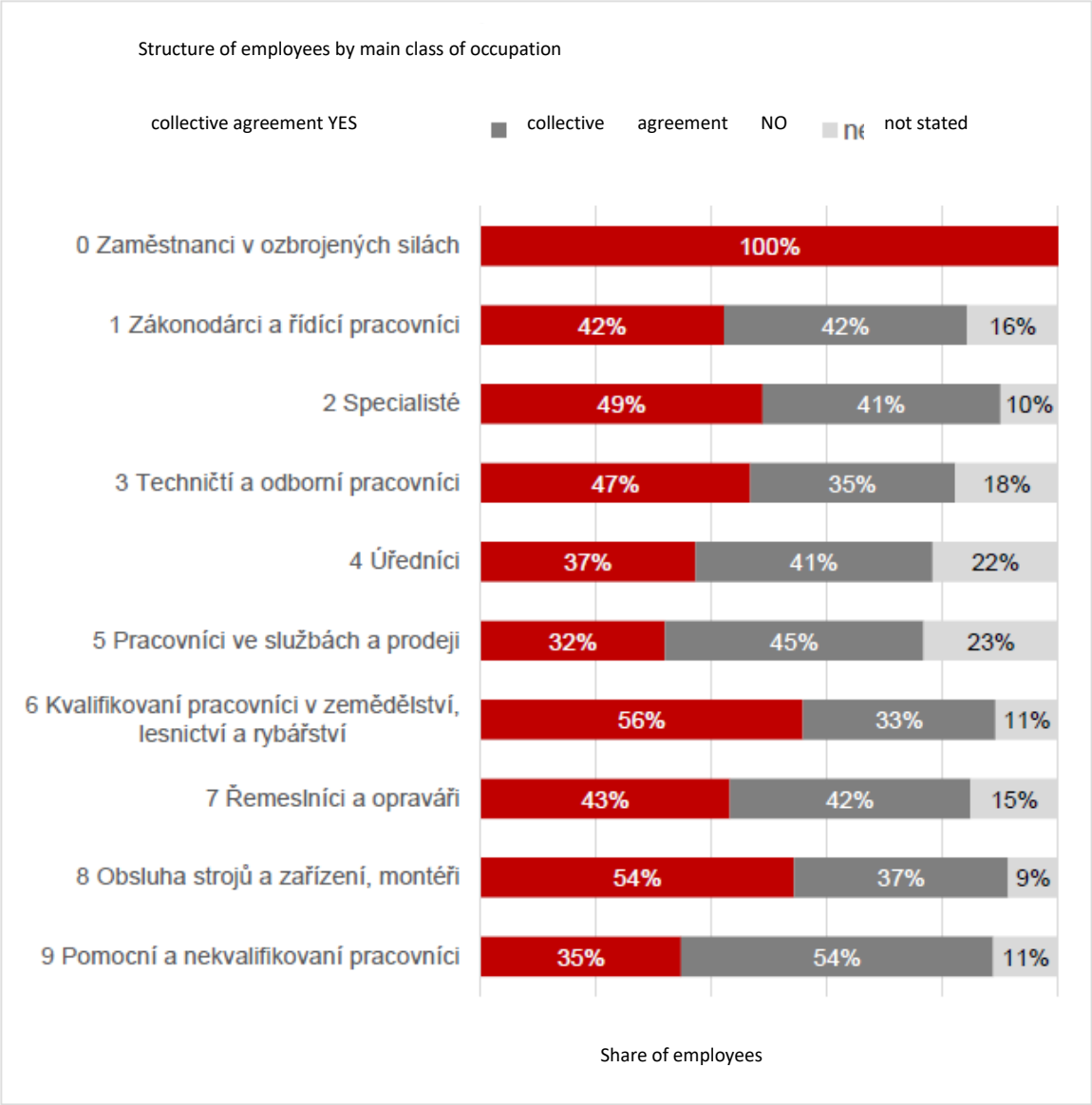


Fig. 9 Coverage of employees by collective agreements by gender in 2018 (CZSO, own adaptation)

There are large differences in the Czech Republic also according to employment in terms of coverage of employees by collective agreements. Employees in the armed forces are fully covered, which is related to the concentration of these workers in a single entity (the Ministry of Defence of the Czech Republic and the Army of the Czech Republic). High protection by collective agreements is enjoyed by employees working as skilled workers in agriculture, forestry and fishing (6th main class of occupations according to the CZ-ISCO classification) and operators of machinery and equipment and fitters (8th main class), as there are more than half of the employees covered by collective agreement in both main classes of occupations. It also corresponds to the data on the coverage of economic entities from the previous chapter. On the contrary, the lowest coverage by collective agreements currently exists for service and sales workers (5th main class) and for auxiliary and unskilled workers (9th main class). Only one-third of employees are protected by a collective agreement in these main classes (see Figure 10).

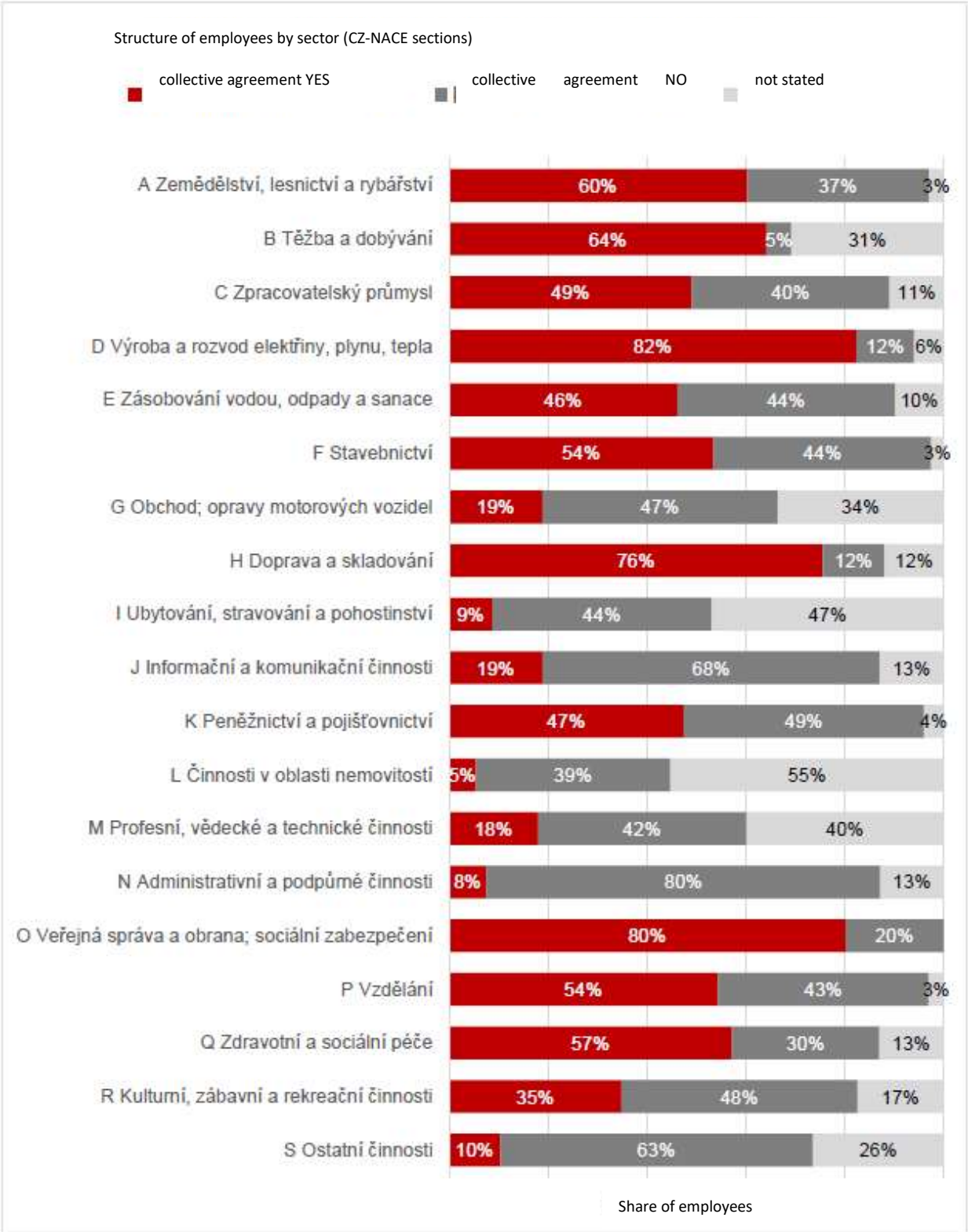


0 Employees in armed forces
1 Legislators and managers
2 Specialists
3 Technical and expert employees
4 Officers
5 Employees in services and sales
6 Skilled employees in agriculture, forestry and fishing
7 Craftsmen and repairmen
8 Machine and equipment operators, assemblers
9 Auxiliary and unskilled employees

Fig. 10 Coverage of employees by collective agreements by occupation in 2018 (MLSA, Trexima adaptation)

The situation in terms of coverage of employees by collective agreements in individual sectors is illustrated in Figure 11. The highest coverage of employees is typical for sectors with a long tradition of collective bargaining (e.g. agriculture, forestry and fishing - section A of the CZ-NACE

classification, mining and quarrying - section B, production and distribution of electricity, gas and heat - section D, or transport and storage - section H) and for public administration, defence and social security (section O).



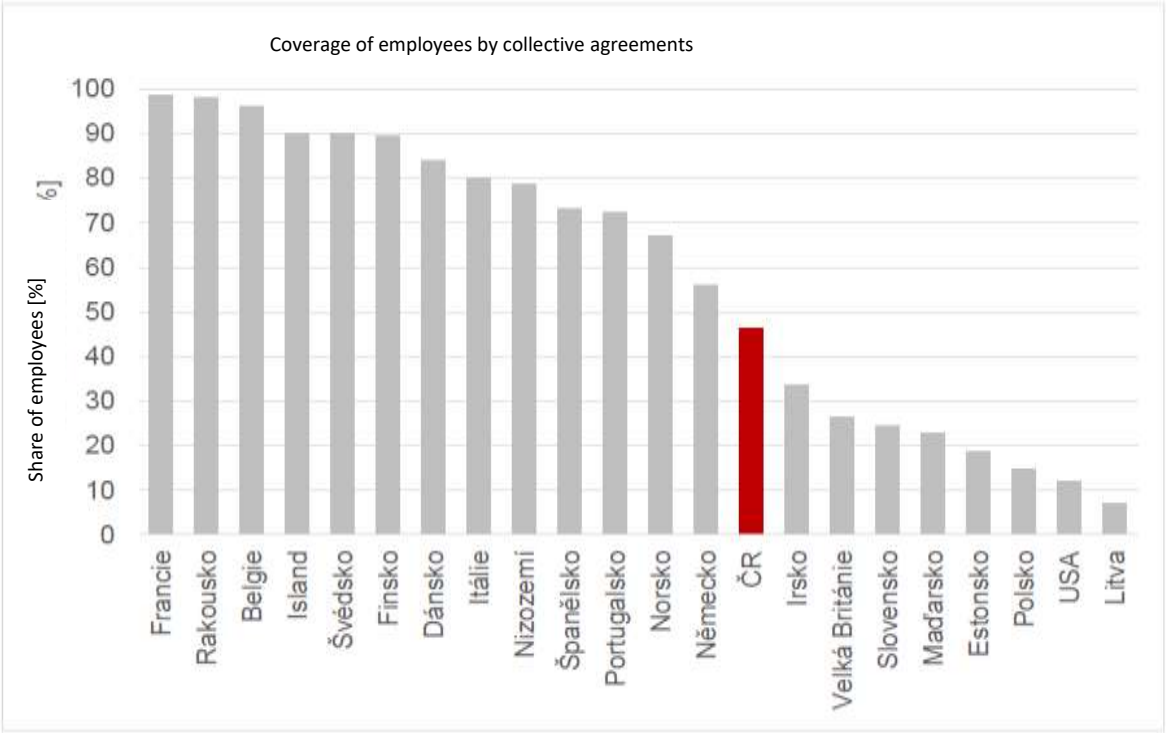
A Agriculture, forestry and fishing

B Mining and quarrying
C Manufacturing industry
D Production and distribution of electricity, gas and heat
E Water supply, waste and remediation
F Construction
G Trade; motor vehicle repairs
H Transport and storage
I Accommodation, food and hospitality
J Information and telecommunication activities
K Finance and insurance industry
L Real estate activities
M Professional, scientific and technical activities
N Administrative and support service activities
O Public administration and defence; social security
P Education
Q Healthcare and social care
R Cultural, entertainment and recreation activities
S Other activities

Fig. 11 Coverage of employees by collective agreements by sector in 2018 (MLSA, Trexima adaptation)

On the contrary, the lowest protection of trade unions is available to employees working in inhomogeneous sectors or sectors characterized by a large number of small economic entities. Examples of these sectors are real estate activities (section L), administrative and support service activities (section N) or accommodation, food and hospitality (section I). Less than 10% of employees are covered by collective agreements in these sectors.

Although the coverage of some groups of Czech employees is low compared to the whole of the Czech Republic, the protection of Czech employees by collective agreements remains relatively high compared to other Visegrád Four countries (see above) and some developed countries (see Figure12).



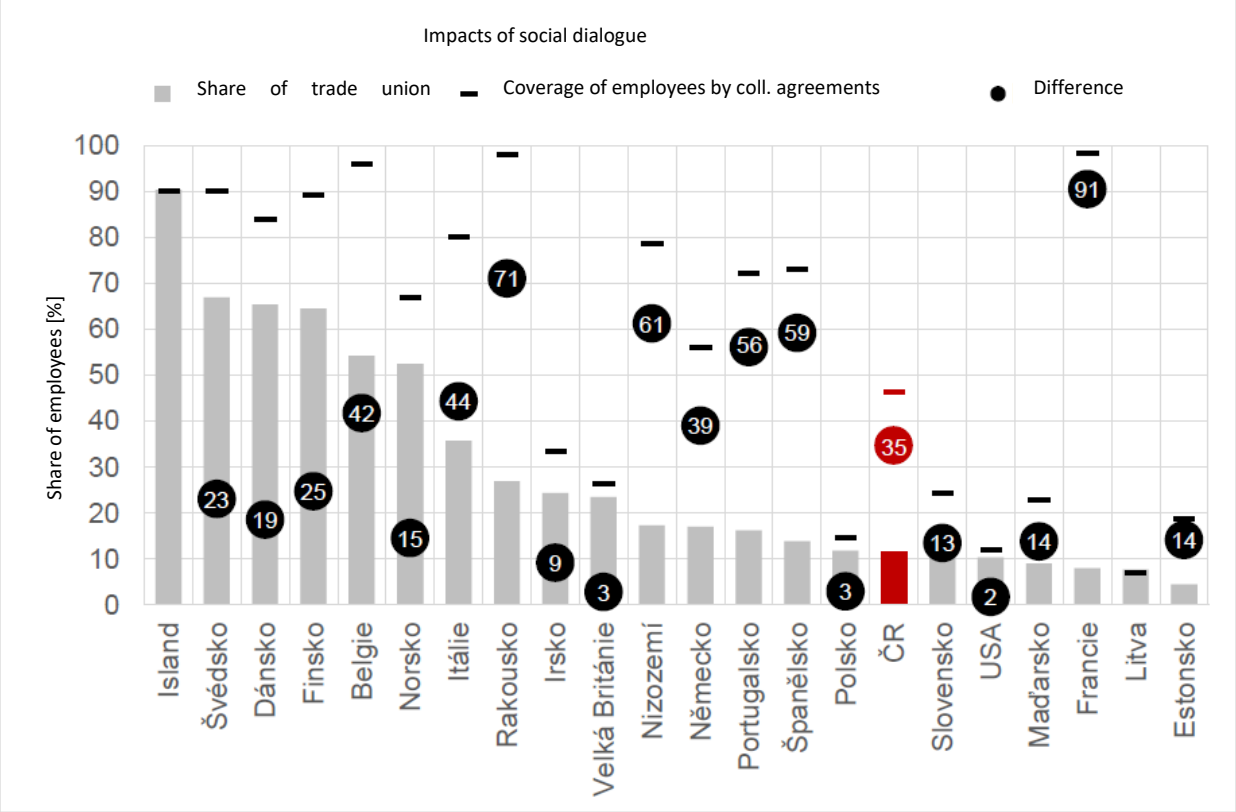
France

Austria, Belgium, Island, Sweden, Finland, Denmark, Italy, The Netherlands, Spain, Portugal, Germany, CR, Ireland, Great Britain,, Slovakia, Hungary, Estonia, Poland, USA, Latvia

Fig. 12 Coverage of employees by collective agreements in international comparison (OECD, Trexima adaptation)

On the other hand, almost all employees are covered by collective agreements in many developed countries. These countries include France, Austria, Belgium, Iceland, Sweden, Finland, Denmark and Italy, where more than 80% of employees are covered by collective agreements.

Data on the coverage of employees by collective agreements as well as on the level of trade union engagement (i.e. the share of employees who are also trade union members) provide important information on the development and status of collective bargaining in a given country. The difference between the two figures offers important information about the strength of the unions in a country. The higher the difference between the two figures, the more non-member employees are represented by trade union members. As Figure 13 shows, trade unions in France have the highest strength in this regard. The union membership base is at the level of 8% of employees, but the results of collective bargaining are valid for 98% of employees. Thanks to the expansion of collective agreements, 91 pp more employees benefit from the activities of trade unions than participated in the negotiations.



Island, Sweden, Denmark, Finland, Belgium, Norway, Italy, Austria, Ireland, Great Britain, The Netherlands, Germany, Portugal, Spain, Poland, CR, Slovakia, USA, Hungary, France, Latvia, Estonia

Fig. 13 Difference between the coverage of employees by collective agreements and the trade union engagement of employees in selected countries (OECD, Trexima adaptation)

On the contrary, trade unions in the USA, Lithuania and Poland have the lowest strength in this respect. Both trade union engagement and collective bargaining coverage are low in these countries. The minimal difference between the two indicators then indicates that the activities of trade unions primarily benefit their members and there is no major overlap with other employees.

In terms of the difference between the share of employees covered by collective agreements and the share of employees who are trade union members, the Czech Republic is at the level of the OECD average. Four times more employees benefit from the trade union activities than participate in them. Trade unions thus have a medium strength in the Czech Republic if we evaluate the results in an international context.

1.3 Legislative framework for collective bargaining

Collective bargaining and collective agreements in the Czech Republic are currently regulated primarily by two legal norms - Act No 262/2006 Coll., the Labour Code, as amended, and Act No 2/1991 Coll., on collective bargaining, as amended. With the adoption of the new Labour Code, the legislation on collective bargaining and collective agreements changed and the scope of the above-mentioned laws was newly defined. Sections 2 to 6 regulating collective agreements were deleted from Act No 2/1991 Coll., on collective bargaining. The contractual type in the form of a collective agreement is newly regulated in Sections 22 to 29 of Act No 262/2006 Coll., the Labour Code. Act No 2/1991 Coll., on collective bargaining, currently regulates only the procedure for concluding and amending collective agreements or the procedure for resolving disputes.

Collective bargaining

The definition of collective bargaining is laid down in International Labour Organization (ILO) Convention No 154 of 1981. According to Article 2 of the Convention, collective bargaining is defined as any action and negotiation between an employer (or group of employers) and a trade union (or group of trade unions), the purpose of which is to lay down working conditions, terms of employment and to regulate relations between employers and workers or between employers or their organisations and a workers' organisation or workers' organisations (i.e. between the social partners).

Czech legislation regulates the term 'collective bargaining' in a narrower sense. Collective bargaining in the Czech Republic is defined in Section 1 of Act No 2/1991 Coll., on collective bargaining, as amended, according to which 'the Act regulates collective bargaining between trade unions and employers or their organizations, assisted by the State when necessary, aimed at concluding collective agreements'. Collective bargaining in the Czech Republic is also related to changes in a collective agreement (Section 8 (5) of the Collective Bargaining Act) or to the emergence of disputes over the conclusion of a collective agreement and disputes over the fulfilment of collective agreement obligations (Section 10 et seq. of the Collective Bargaining Code).

The fact that the national regulation of collective bargaining is narrower than the international regulation does not adversely affect the negotiations between employees and employers. Although the Collective Bargaining Act regulates only the part of negotiations concerning collective agreements, the other areas mentioned in ILO Convention No 154 are not neglected. However, the regulation of these areas is a part of Act No 262/2006 Coll., the Labour Code, as amended, which stipulates specific rules of conduct in the relevant labour and other legal relations. The Labour Code regulates the position of trade unions in the Czech Republic, while the relevant provisions concern, in particular, the regulation of:

- the right of co-decision of both social partners (e.g., Section 61 of the Labour Code),
- the right of discussion (e.g., Section 46),
- the right of information (e.g., Section 38 (3)),
- the right to control (e.g., Section 322 of the Labour Code),
- the right to the proper performance of trade union activities (e.g., Section 277),
- employees' rights (e.g., Section 62).

Commencement of collective bargaining

The procedure for concluding collective agreements is regulated by Section 8 of the Collective Bargaining Act. According to Section 8 (1), collective bargaining is initiated by the submission of a written proposal of a collective agreement by one of the contracting parties to the other contracting party. The other contracting party is, according to Section 8 (2), obliged to respond to the proposal in writing without undue delay and to comment on those proposals which it has not accepted. The amendment to the Collective Bargaining Act, implemented by Act No 264/2006 Coll., which amends certain acts in connection with the adoption of the Labour Code, tightened the rules concerning the obligation of the beneficiary of the proposal to respond to it.

According to Section 8 (3) of the Collective Bargaining Act, the contracting parties are obliged to negotiate with each other and provide each other with the required cooperation, provided that it does not conflict with their legitimate interests.

Collective agreement

The issue of collective agreements is regulated primarily by Act No 262/2006 Coll., the Labour Code in Sections 22 to 29.

Only a trade union may conclude a collective agreement on the behalf of employees pursuant to Section 22 of the Labour Code. However, according to Section 24 (1) of the Labour Code, this organization automatically concludes a collective agreement also for employees who are not involved in a trade union. If there are several trade unions operating for the employer, the employer is obliged to negotiate the conclusion of a collective agreement with all trade unions according to Section 24 (2) of the Labour Code. According to this provision, trade unions act with legal consequences for all employees together and in mutual agreement, unless they agree otherwise between themselves and the employer.

The current legislation on collective bargaining does not contain a **definition of a collective agreement**. However, a collective agreement can be defined as 'a bilateral written labour act, having the nature of a normative act, resulting from collective bargaining between the contracting parties and regulating individual and collective relations between employers and employees and the rights and obligations of the contracting parties (collective agreement participants)'. The **Labour Code** currently **defines only the content** of collective agreements. According to Section 23 (1) of the Labour Code, it is possible in the collective agreement to regulate the rights of employees in labour relations, as well as the rights or obligations of the parties to this agreement. [8]

The Labour Code further distinguishes between two types of collective agreements, namely company agreements and higher-level agreements.

A **company collective agreement** is concluded between one or more employers and a trade union or trade unions operating for the employer according to Section 23 (3) (a).

A **higher-level collective agreement** is concluded between the employers' organization or organizations and the trade union or trade unions according to 23 (3) (b). At present, according to Section 25 (2) (a) of the Labour Code, a higher-level collective agreement is binding also for employers who are members of an employers' organization that has concluded a higher-level collective agreement. According to Section 25 (2) (a), the higher-level collective agreement is also binding for employers who have left the employers' organization during the life of the collective agreement and cannot therefore be excluded from the effectiveness of the higher-level collective agreement by leaving the union.

According to the current legislation, the collective agreement also **applies to employees working on the basis of agreements on work performed outside employment** (i.e. agreements to complete a job and agreements to perform work concluded in accordance with Part III of the Labour Code). According to Section 77 (2) of the Labour Code, work performed on the basis of agreements is subject to the regulation for the performance of work in an employment, unless otherwise provided by law. In connection with collective agreements, the following rights may be granted to persons working on the basis of agreements on work performed outside employment:

- The right to equal pay for equal work and work of equal value. The employee's right to remuneration from the agreement cannot be regulated by a collective agreement because it follows from Section 138 of the Labour Code that the amount of remuneration and the conditions for its provision are agreed directly in the agreement to complete a job or agreement to perform work. However, the principle of equal wage, salary or remuneration for equal work and work of equal value under Section 110 of the Labour Code implies that an employee employed under an agreement must earn the same under the same conditions as an employed employee, although this remuneration may not be provided in the structure in which the wage or salary belongs. Therefore, it does not have to include individual components, such as tariff remuneration, bonuses, benefits or rewards, but this remuneration must be the same under the same conditions in terms of

the total amount. The collective agreement will thus indirectly affect the amount of remuneration if it stipulates the amount of individual wage components;

- The right to discounted company meals as employed employees (otherwise the principle of equality in the working conditions of employees is violated);
- The employee's right to other important personal obstacles at work and to leave. It is possible to arrange directly in the agreement to perform work or to stipulate in an internal regulation the right of the employee to other important personal obstacles at work and to leave, under the same conditions as employed employees. Thus, a collective agreement cannot directly establish the right of an employee working on the basis of an agreement to perform work to leave in the event of obstacles at work on the part of the employee and the right to leave, but may act indirectly (if the relevant employee rights are agreed in the agreement to perform work, it is in the amount and to the extent provided by the collective agreement);
- Organization of working hours. Based on a collective agreement, it is possible to apply to agreements the legal framework of working hours or some of its segments (e.g. breaks at work for food and rest, limitation of shift length or periods of continuous rest).

2 Impacts of digitalisation, automation and other factors

We are in the period of the Fourth Industrial Revolution, which brings changes to our personal and professional lives. The entire customer environment is changing significantly. An ordinary product delivered within a few days is often not enough for the customer. The customer wants a 'tailor-made', 'instant', 'reasonably priced' product. In an effort to focus on the customer and meet his/her needs, wishes and requirements, there are changes in the internal management of companies, which, for example, focuses on process management and greater interconnection of individual parts of the company in an effort to create a more efficient and effective organization. Also in this context, there is a greater integration of supplier-customer relationships. However, in order for the implementation of all changes in business management to be successful, it is not possible to use modern technologies. In virtually all sectors of the economy, digitalisation, automation and robotics in general are gradually gaining ground. The use of modern technologies such as modern software tools, the Internet of Things, cloud computing, BigData and their analysis, artificial intelligence or, for example, additive manufacturing is growing. The changes brought about by the Fourth Industrial Revolution are therefore fundamental. It is difficult to predict them, but it is necessary to prepare for them. We can say with certainty that it will significantly affect our work and personal lives. [11]

2.1 Impacts on the nature of work and working conditions

The introduction and use of modern technologies significantly change working conditions. Thanks to digitalisation, automation and robotics, individual workplaces and the nature of work are changing significantly. Businesses are increasingly using robots, and more recently also cobots, i.e. robots with which humans work directly. An analysis commissioned by the World Economic Forum suggests that in the short to medium term, some human positions will be strengthened rather than completely replaced by machine and computer work. Replacing routine and repetitive tasks will lead to better use of human potential and talent and thus increase productivity and competitiveness. Much of automation occurs at the level of tasks, not at the level of entire jobs or professions. It is estimated that about 2/3 of jobs contain at least 30% of automated tasks and ¼ jobs contain more than 70% of automated work tasks. Nevertheless, it is quite clear that the share of tasks processed by machines and computers will grow in the long run - the most burdened are positions dealing with information and data processing, performing complex and technical activities, performing physical and manual work activities or administering. Increase in the work of machines/computers is expected in these jobs by up to 17% (Figure 15). [12]

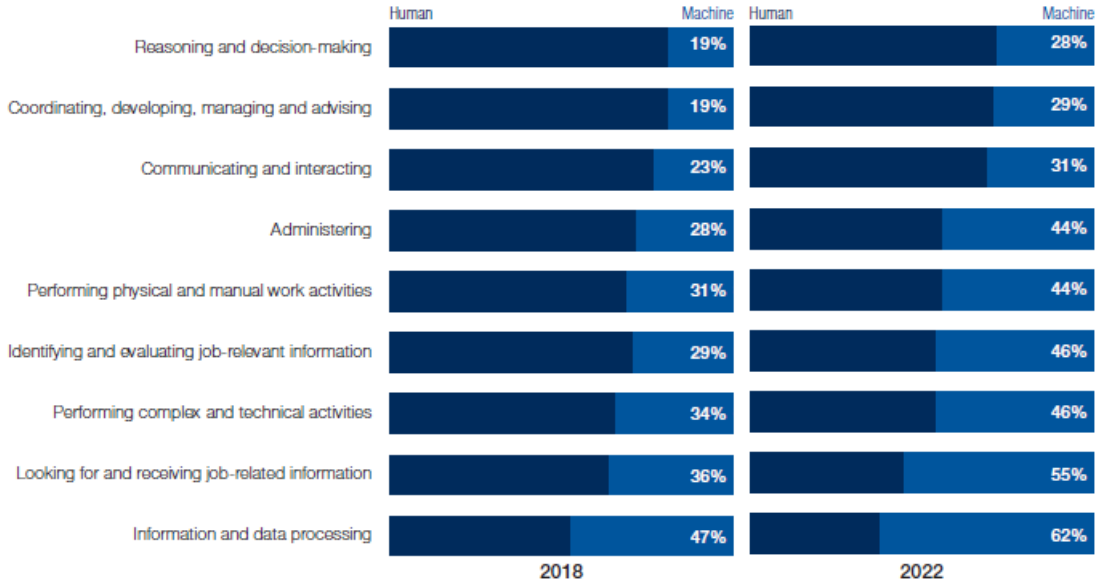


Fig. 15: Proportion of work performed by man and machine, 2018-2020 [12]

The use of software tools is growing in offices, it is no longer just ERP systems or office applications, but simulation tools, for example, are being used more and more. Thanks to technical progress, we are no longer tied only to our workplace in the company, but we can work from home or on the go thanks to mobile devices, cloud computing and the Internet. Communication and cooperation within and outside the company is moving to virtual space.

Naturally, these changes bring many benefits. We have already mentioned that in some respects it facilitates work and makes better use of human potential, but there are other benefits such as a better work-life balance, etc. However, they also bring risks. They affect the safety of workplaces, workers have to work with equipment and IT systems which are not always sufficiently ergonomic, work is intensified, the boundaries between private and professional life are erased and the problem of unlimited availability arises, social contact decreases, etc. Given that all these risks affect the potential work well-being of the employee, who is a key resource of the company, it is necessary to set up and prepare appropriate measures that will lead to their minimization.

2.2 Assumptions of affected jobs by country

As part of the still relatively current extensive analysis of the OECD from 2018, which took into account various factors (including requirements for the level of skills and activities necessary for the performance of individual professions), it is assumed that automation will burden about 14% of jobs and another 32% of professions with significant changes in the next 10-20 years (Figure 16). These estimates are significantly more positive than in the past. The best situation is in the Nordic countries, the USA or the United Kingdom, where the services segment is strongly developed, the worst in Slovakia, but also in Germany or Japan.

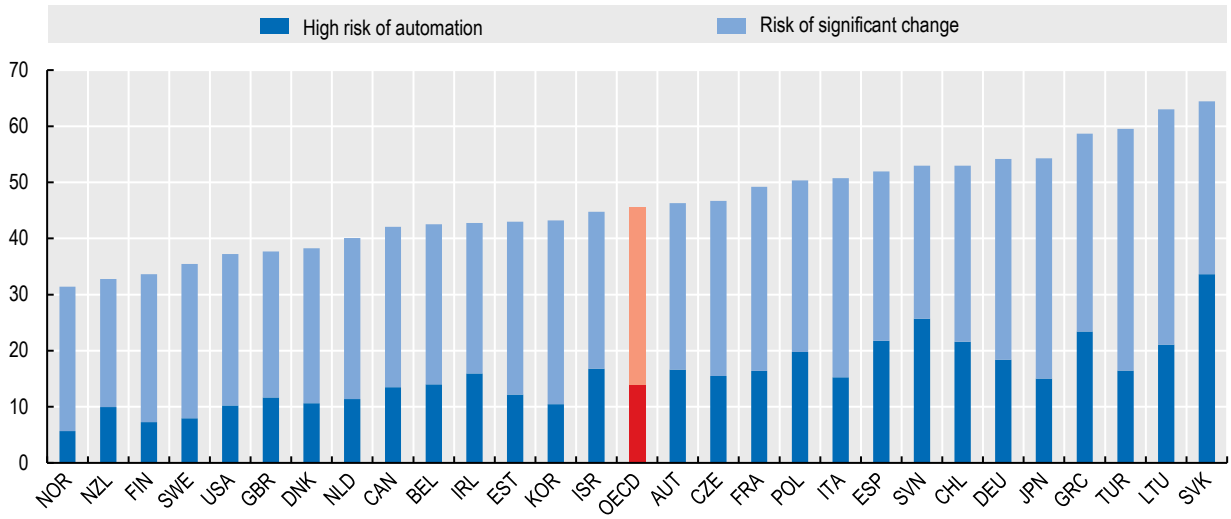


Fig. 16: Proportion of places with a high risk of automation and places with a risk of significant change (%) [13]

The analysis of the impacts of automation and robotics on the labour market in 2018 was also carried out by the consulting company PwC, its analysis is based on similar principles as the OECD analysis, but considers other factors such as the level of technology in relation to their implementation in practice, various sectors of the economy, different composition of workers (gender, age, education). The analysis distinguishes 3 waves of automation and robotics, which will run gradually in the periods up to 2025/2030/2039. Jobs will be most affected by automation in Slovakia, the Czech Republic and Slovenia, especially in the second and third waves. This is mainly due to the fact that these are countries with a strong manufacturing industry. However, these waves will also strongly affect the USA, where the problem is lower education, or Italy, where there is a population with a relatively old age for a change. On the other hand, countries such as Finland or Korea will be the least affected.

2.3 Assumptions of affected jobs by industry

As noted above, the introduction of modern technologies in the various sectors of the economy will take place at different intensities and at different times, given their different level of development. According to the aforementioned PwC survey, it is quite logical that the first wave is expected to hit services the hardest, namely the finance and insurance sectors, the ICT services sector and the professional, scientific and technical activities sector. Automation is expected to affect around 8% of jobs in these sectors (Figure 17).

The second wave, which includes the automation of more complex tasks, will again hit finance and insurance, public administration, transport and storage, and the manufacturing industry most noticeably, where around 25% of jobs will always be at risk. The third wave, in which the automation of physical and manual work is already assumed, logically concerns especially transport and storage, manufacturing and construction, again about 25% of jobs will be at risk. Overall, the automation will affect the accommodation and catering services and healthcare sectors the least, where up to 23% of jobs are at risk in total for all waves, and education, where

it is less than 10% for all three waves. Overall, the transport and storage sector (53% of jobs at risk) and the manufacturing industry (approximately 45% of jobs at risk) will be most affected.

Within the manufacturing industry, which is an important sector in the Czech Republic, the highest risk to jobs is expected in the second and third waves (Figure 17). The second wave, which will take place during the 2020s, will affect about 23% of jobs (335,000 jobs). The third wave in the 2030s will affect 20% of jobs (290,000 jobs).

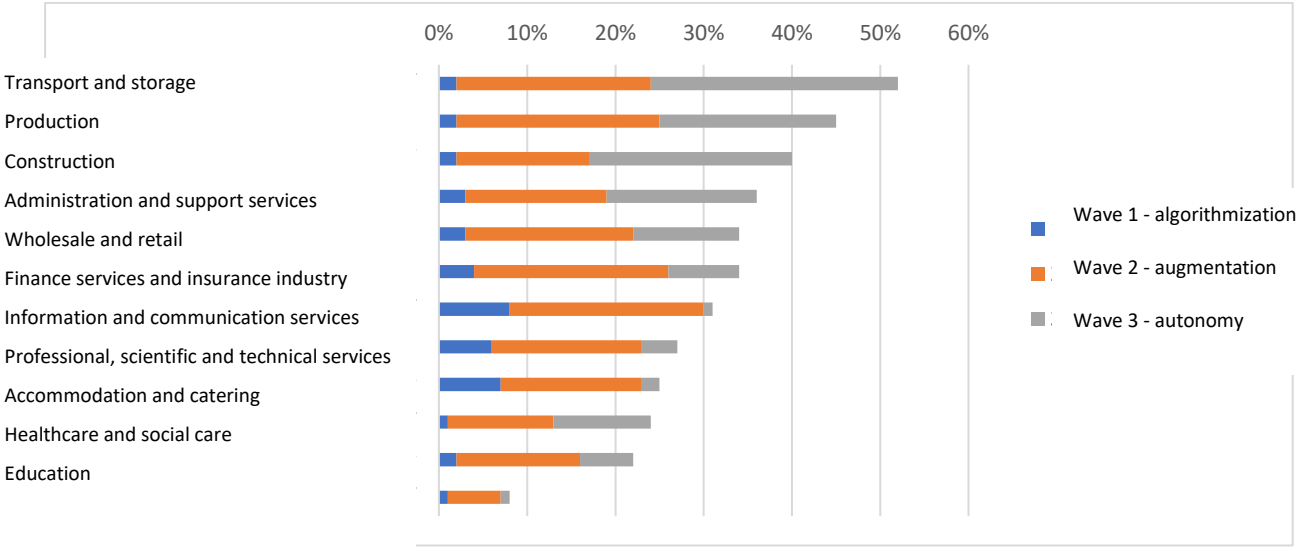


Fig. 17: The potential of profession automation in individual sectors of the economy. Source: Adapted according to [14]

2.4 Expected impacts by business

One thing is what changes are expected or predicted by the analyses of international organizations, consulting companies and experts, and another thing is how the situation is perceived by the companies themselves. A recent 2019 survey by Boston Consulting Group [15] among 1,314 companies from around the world shows that a large proportion of companies expect to lay off workers in connection with robotics. Redundancies of at least 5% of employees are expected by 56% of Asian, 50% of North American and 44% of European companies (Figure 18).

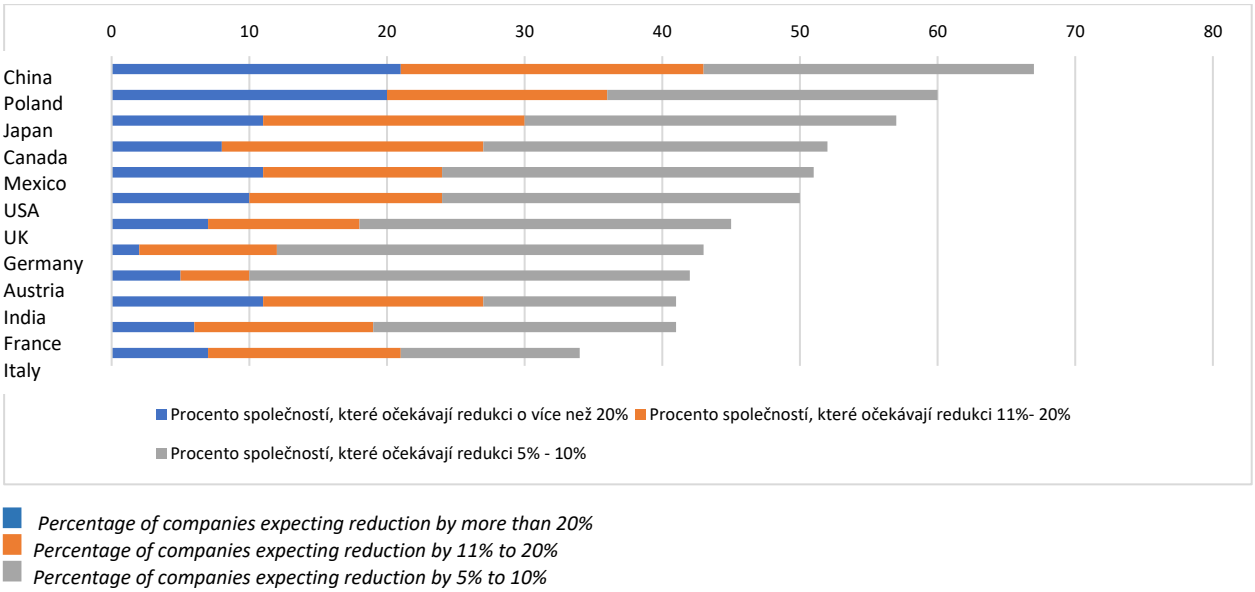


Fig. 18: Impact of the implementation of advanced robotics on the number of jobs. Source: Adapted according to [15]

Overall, companies from China, Poland and Japan anticipate redundancies (57-67% of companies), followed by companies from Italy (34%), which may be to some extent related to the age of local population. At the same time, however, 62% of companies add that, in connection with the introduction of advanced robotics, they also expect to hire new employees - white collars, for example, to adapt new solutions to the company's needs.

A survey conducted by the World Economic Forum in 2018 found that companies did indeed anticipate redundancies due to automation (Figure 19), specifically up to 50% of companies. However, 38% of companies generally expect to recruit new employees and 28% of companies expect to recruit new employees due to automation.

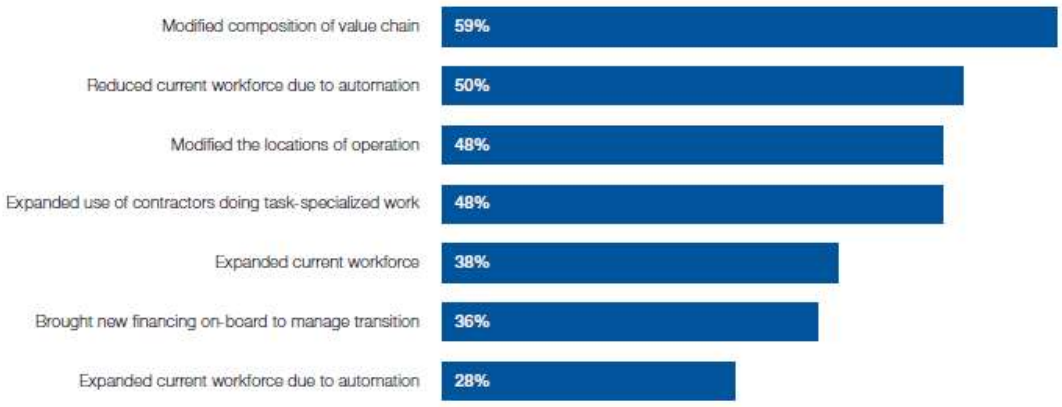


Fig. 19: Impacts of current changes on the workforce by company [12]

2.5 New professions and skills

New professions will emerge and expand and others will disappear in connection with the introduction of modern technologies. Due to the fact that modern technologies are significantly connected with ICT, the development of professions in this area is expected. These are, for example, software or application developers, specialists in cloud computing, artificial intelligence and machine learning, blockchain or experts in digital transformation. Along with the development of ICT and Internet connection, cyber security specialists and workers focused on data protection, know-how, critical infrastructure security, risk assessment and management, crisis management and computer systems attacks will also be needed. With regard to the development of e-commerce, specialists will be needed in this area as well. E.g. specialists in digital marketing and strategy, social media, experts for remote support for their products.

There is also a significant increase in corporate data from companies from various sources, not only from traditional accounting and economic systems, but also data supplied by various sensors from production and other equipment, as well as from the products themselves in real time. Therefore, businesses anticipate a greater need for specialists focused on BigData, data analysis, database specialists or data creation, processing and visualization specialists.

With the development of new production technologies, the need for workers with a focus on innovation, new technologies in general (e.g. IoT), process automation or robotics, additive technologies, industrial protocols and designers of new production facilities will also be needed.

On the contrary, redundant or increasingly endangered professions will gradually include data entry clerks, administrative staff, accountants, selected warehouse workers, bank officials, salespeople, manual production workers, machine repairers, telemarketers, etc.

The analysis of the World Economic Forum from 2018 summarizes in detail the development in the professional field for 2018-2022 (Figure 20).

Stable Roles	New Roles	Redundant Roles
Managing Directors and Chief Executives	Data Analysts and Scientists*	Data Entry Clerks
General and Operations Managers*	AI and Machine Learning Specialists	Accounting, Bookkeeping and Payroll Clerks
Software and Applications Developers and Analysts*	General and Operations Managers*	Administrative and Executive Secretaries
Data Analysts and Scientists*	Big Data Specialists	Assembly and Factory Workers
Sales and Marketing Professionals*	Digital Transformation Specialists	Client Information and Customer Service Workers*
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Sales and Marketing Professionals*	Business Services and Administration Managers
Human Resources Specialists	New Technology Specialists	Accountants and Auditors
Financial and Investment Advisers	Organizational Development Specialists*	Material-Recording and Stock-Keeping Clerks
Database and Network Professionals	Software and Applications Developers and Analysts*	General and Operations Managers*
Supply Chain and Logistics Specialists	Information Technology Services	Postal Service Clerks
Risk Management Specialists	Process Automation Specialists	Financial Analysts
Information Security Analysts*	Innovation Professionals	Cashiers and Ticket Clerks
Management and Organization Analysts	Information Security Analysts*	Mechanics and Machinery Repairers
Electrotechnology Engineers	Ecommerce and Social Media Specialists	Telemarketers
Organizational Development Specialists*	User Experience and Human-Machine Interaction Designers	Electronics and Telecommunications Installers and Repairers
Chemical Processing Plant Operators	Training and Development Specialists	Bank Tellers and Related Clerks
University and Higher Education Teachers	Robotics Specialists and Engineers	Car, Van and Motorcycle Drivers
Compliance Officers	People and Culture Specialists	Sales and Purchasing Agents and Brokers
Energy and Petroleum Engineers	Client Information and Customer Service Workers*	Door-To-Door Sales Workers, News and Street Vendors, and Related Workers
Robotics Specialists and Engineers	Service and Solutions Designers	Statistical, Finance and Insurance Clerks
Petroleum and Natural Gas Refining Plant Operators	Digital Marketing and Strategy Specialists	Lawyers

Fig. 20: Examples of stable, new and redundant jobs, all industrial areas [12]

2.6 Need for skilled workers

However, new or modified jobs will often require a different set of knowledge, skills and abilities. The analysis by the Statista portal [16] expects a worldwide increase in the share of highly educated workers (managers and specialists) from 14% in 2019 to 17% in 2030 and middle-educated workers, trained workers (technicians, tradesmen, craftsmen, etc.) from 41% in 2019 to 43% in 2030. On the contrary, a more significant decline of the least educated (production operators, farmers, etc.) is expected, from 45% in 2019 to 39% in 2030.

One way to get such workers is to recruit them. However, given the growing need on the part of all businesses, demographic change or the capacity of education systems in individual countries, there may not be enough skilled workers. This fact is to some extent confirmed by the Statista portal analysis, which states, for example, that Germany will face the fundamental shortage of qualified workers . An absolute shortage of educated workers is estimated at 1.95 million graduates by 2030, which is an average annual shortage of around 1.6% (Figure 21). Given that the Czech workforce is still one of the cheaper and the Czech Republic borders Germany, this fact suggests potential problems for the Czech Republic associated with the departure of our educated workers, which are already in short supply in some areas. In contrast, a surplus of educated labour force is expected in Italy and France. Outside Europe, Japan and the United States will face a significant shortage. The real situation in the world is shown in the following diagram (Figure 21).

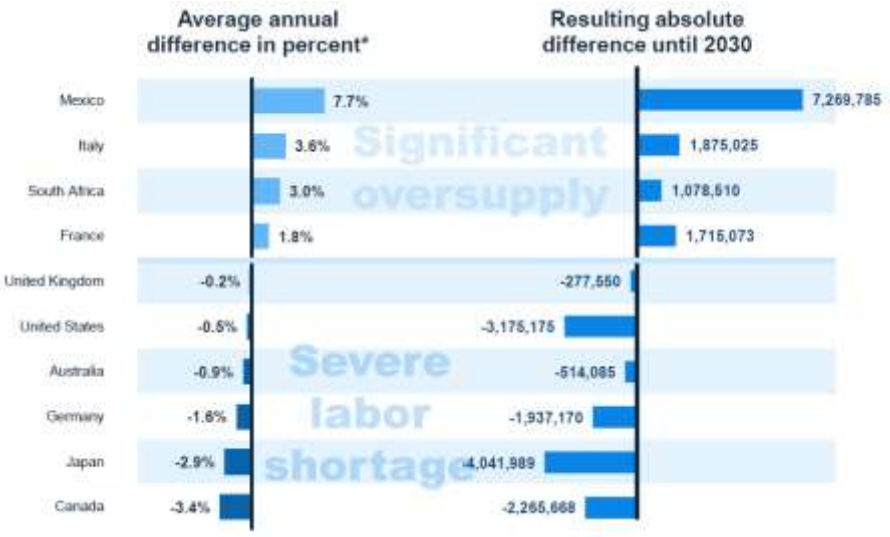


Fig. 21: Annual and resulting development of the number of university graduates by 2030 [16]

However, even if there were enough skilled workers as a result, what would happen to the existing ones in the case of recruiting new employees? The shortage of qualified staff will therefore be important to address by a system of retraining, education and training of existing ones. A World Economic Forum survey estimates that only 46% of workers will not need retraining or training. The remaining 54% will then need retraining and training to varying degrees, about 25% within 3 months, about 10% for 3-6 months, 9% for 6-12 months and 10% for more than 1 year (Figure 22).

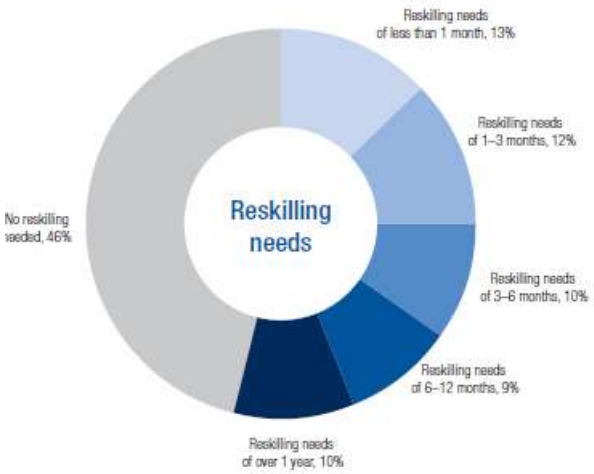


Fig. 22: Expected average retraining time in 2022 [12]

Most companies from the survey expect to use mainly their internal departments (85%) and external companies (75%) in connection with retraining and training of employees. Companies expect the least the use of employee unions (23%).

However, in the context of training and retraining, care must be taken to ensure that, as a result, workers are not either insufficiently qualified or over-qualified. This is a problem that has long been highlighted in the OECD reports. The situation is at a good level in the Czech Republic, the

employment of an unsuitable applicant occurs only in 14% compared to e.g. 37% in Germany. The result is improperly spent funds. [17]

3 Agreement on the introduction of modern technologies

Digitalisation, automation, robotics, and introduction of modern technologies in general is a complex and challenging issue with far-reaching implications for the future. It is therefore quite clear that the implementation of these modern technologies will not be possible without a thorough analysis of the current state, preparation and planning, implementation and finally evaluation of the success and benefits of implementation. Given the direct impact on employees, it is absolutely essential and logical that even employee representatives have the opportunity to influence, enter and participate in this complex process. After all, employees are often actors directly confronted with technical innovation and should therefore be able to contribute their knowledge and skills to the processes of change - they are, after all, experts in the business activities entrusted to them. In addition, the engagement of employee representatives minimizes the risk of neglecting potential problems. Employees are also those who feel the effects of introduction of new technologies in the form of affecting the quality of work and working conditions or in the form of a potential risk of losing their job. Last but not least, we must not forget that the engagement of employees creates a sense of belonging to the company, their work, and any changes.

It is the possibility of involving employees in the process of introducing modern technologies into companies that is the first and key area, one could say the so-called 'gateway', which is absolutely essential to define in collective agreements. Within the implementation process, from the point of view of employees, there is the greatest space and opportunity to affect the entire solution as effectively as possible. An example can be the selection of technology with the necessary ergonomics, ensuring sufficient training, etc. Any remedies implemented after implementation are always significantly more complicated and less effective and successful. Even though the introduction of modern technologies is already in full swing in some companies, it is never too late to get involved and get on the bandwagon, because we can always affect something.

An agreement on the introduction of modern technologies can play a more important role for the employers than it might seem at first glance. Its conclusion can reduce employees' sense of insecurity and fear of what digitalisation and automation will bring them in the future. The mental wellbeing of employees living and working in uncertainty about their future is not good, which can often lead to, for example, a decrease in productivity or quality of work performed or to even more serious problems, such as absence due to illness, etc.

3.1 Key principles and rules of collective agreements

We can identify at least 3 key areas that should be defined in collective agreements in connection with the actual introduction of modern technologies. These are the following areas, which are discussed in more detail below:

- Employee participation in bodies
- Partnership process setting

- Timeframe setting

3.1.1 Employee participation in bodies

The participation of employee representatives in the introduction of modern technologies should be addressed in collective agreements. Existing bodies, such as works councils in Germany, can serve this purpose. However, it needs to be clearly defined in collective agreements. An indirect advantage of involving these existing bodies in the introduction of modern technologies may be a better anchoring in the functioning of the company. However, various types of new bodies can be set up directly, such as evaluation committees, which will directly assist in evaluating the possibilities of introducing modern technologies in individual business areas. These committees often participate in training or presentations of new technologies.

Employee representatives should meet certain criteria. They should be both experts and negotiators. It is also important to correctly evaluate which business departments will be represented in the bodies. Selected representatives should be able, if necessary, to prepare sufficiently for their participation and work and to undertake in advance potentially necessary training on digitalisation, automation, robotics, etc., or use the expertise of other employees, employee surveys, meetings within departments, etc. [18]

3.1.2 Partnership process setting

Furthermore, the key parameters of the 'partnership' process in the field of digitalisation, automation and robotics, in the process of introducing modern technologies in general, should be defined. [1] The main goal of the process is to achieve a consensual and successful integration of modern technologies in the workplace, including seizing opportunities but also preventing and minimizing risks for workers and employers and ensuring the best possible outcome for both employers and workers. The interdisciplinary nature of the process is essential, capturing all elements of workplaces and interconnecting them so that they are not addressed separately. Some features of the process are universal, others are not. It is necessary to deal with different situations or circumstances and modify the process depending on the needs of a particular country, sector, company (type, size, etc.) or, for example, the situation in which the company finds itself.

The process can be seen in Figure 23 and can be divided into 5 phases [1]:

1. Joint exploration/preparation/underpinning - represents research, awareness raising and confidence building and the right underpinning knowledge base to openly discuss the opportunities and challenges or risks of digitalisation, their impact on the workplace and possible processes and solutions.
2. Joint mapping, regular assessment, analysis - focuses on mapping specific areas in terms of challenges, risks, benefits and opportunities in terms of how the integration of digital technology can benefit or limit workers and the company. Possible measures are also identified at this stage. SMEs may need external advice/support.
3. Joint overview of situation and adoption of strategies for digital transformation - follows up on the above steps and is actually the result of them. It is a basic understanding of the

opportunities, challenges, risks, various elements and their interrelationships, as well as a consensus on digital strategies setting future business goals.

4. Adoption of appropriate measures/actions - this phase is based on a joint overview of situation. It includes: the possibility of testing the envisaged solutions, setting priorities, timing, implementation in successive time-limited phases, clarification and definition of roles and responsibilities of management and employees and their representatives, definition of resources and accompanying measures such as (professional) support, monitoring, etc.
5. Regular joint monitoring/follow-up, learning, evaluation - represents the last phase with which the process closes. It includes a joint evaluation of the effectiveness of the measures and a discussion on whether further analysis, awareness raising, underpinning or any further action is needed.

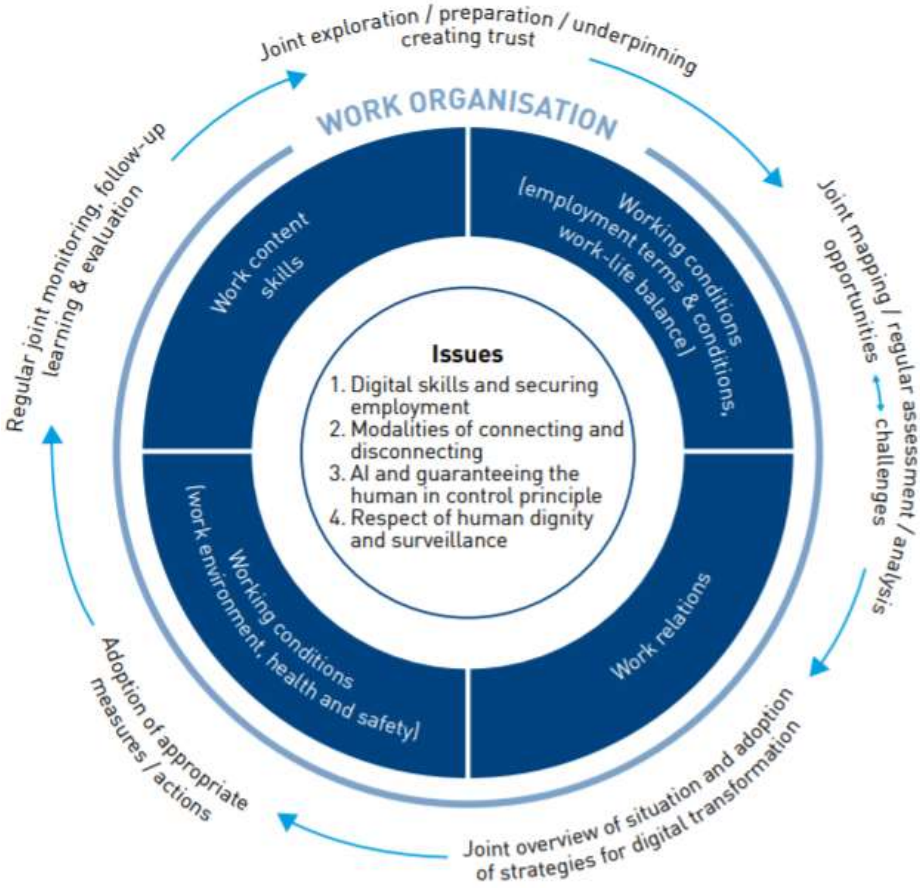


Fig. 23: The 'partnership' process in the field of digitalisation [1]

Concerns about impacts on working conditions, health and safety requiring immediate attention need to be addressed. It is in the interest of employers and workers to adapt the work organization to the ongoing transformation, if necessary. This adjustment should be made in a way that respects the interests of employees and the privileges of employers as regards the work organization at company level.

The presence or introduction of digital technologies or tools has an impact on the work organization (Figure 23 - Work organisation), where we can include several key topics, such as working conditions, work organization, education, etc. All these topics must be discussed and considered in the various steps of the process. The individual areas are addressed in more detail in the next chapter. [1,18]

The joint commitment of employers, employees and their representatives to an agreed and jointly managed process is essential for overall success and sustainable development. Equally important is respect for the roles and representatives of all participants (see also above - employee participation in committees) and helpfulness and willingness to communicate. It is also important to communicate and pass on information from the company and employee representatives to employees. Employee representatives must be provided with such information, tools or equipment that are necessary for effective engagement in the various phases of the process. [1,18]

3.1.3 Timeframe setting

It is necessary to set a timeframe for the process, which is also important. For this reason, we mention it directly here again, although this fact has already been mentioned above. Employees or their representatives should be able to always evaluate the impacts of new technologies on employment, quality and working conditions, etc. well in advance. Without sufficient time, the evaluation would either not be possible at all or may not be sufficient and could lead to the omission or underestimation of some problems.

3.2 Best practice examples

In connection with the definition of key principles and rules for the implementation of modern technologies, here are some best practice examples in the framework of collective agreements:

Tab. 1: Best practice examples - agreement on the introduction of modern technologies

Subject/ Sector	Solution
Renault (Spain)	In order to remain competitive, we must, like other companies in the automotive industry, use new modern technologies. In this context, a committee for new technologies is set up, which includes 7 employee representatives. Employees will be able to have their representatives in seminars focused on new technologies. The company's management also undertakes to inform the committee in advance about the introduction of new technologies, the impact on employment or working conditions. [31]
Chemical industry (Spain)	In the case of the introduction of new technologies, which bring about fundamental changes in working conditions and require adaptation for more than a month and extensive training, this fact must be communicated to the employee representatives well in advance. Employee representatives then have time for analysis in relation to employment, work organization, health, training, etc. In addition, the workers concerned must be adequately trained.

	The introduction of new technologies will, where appropriate, include an updated occupational risk assessment. [31]
NANO Automotive S.L. (Spain)	Management and employee representatives recognize that new technologies are essential for the development of the company. Their introduction should therefore be an opportunity to improve working conditions and productivity. The company's management undertakes to inform in well advance about technological changes so that employees representatives have time to evaluate the effects of these changes with regard to employment, working conditions, training, etc. [31]
Public services (Norway)	The Ministry of Local Government, the Public Service Workers' Union and the Association of Local and Regional Authorities reached a tripartite agreement on social dialogue and the engagement of workers in the digitalisation of the public sector in September 2017. The agreement commits the social partners to shaping the digitalisation of local government services through a combination of collective bargaining, consultation and cooperation at the workplaces. The agreement was followed by a pilot project involving 70 local authorities and presenting an innovative combination of consultation and cooperation at the workplaces - including the appointment of so-called 'agents of change', some of which are elected by local unions. The project places great emphasis on the organization study and includes the development of a digital platform for sharing knowledge and experience between different communities. The Norwegian Health Authority preferred consultation and cooperation after realizing that breaches of confidentiality information about patients by a private supplier could be prevented by improving communication. Good experience from local dialogue is also reflected in sectoral dialogue, including collective bargaining processes. The agreement was followed by negotiations concerning workers' rights to training throughout their working lives, to compensation for loss of earnings during training and to higher remuneration based on improved skills. [20,21]
Unit the Union (Great Britain)	Naturally, the unions also focused on preparing the content of collective agreements, which would consider the introduction of modern technologies. In this context, the unions of the Unit the Union from Great Britain prepared a draft 'New Technology Agreement'. Under the agreement, the employer agrees to work actively on using the new technologies for the benefit of everyone within the organization, including its employees, whether directly or indirectly employed. The aim of the agreement is to ensure that the introduction of new technologies takes place on the basis of a mutual agreement based on a comprehensive review of the relevant information and is monitored by commissioners or representatives of Unit the Union. The agreement provides an organization-wide framework and set of principles for addressing issues arising from proposals to introduce new technology. Sufficient time and resources should also be earmarked to address potential implementation issues. New technology in this agreement is defined as any innovation that affects workers' jobs, including new techniques, machines, controls, materials, processes and/or work organization systems. The agreement contains, inter alia, the following principles and rules.

	The following principles will apply: • The introduction and operation of new technologies in the workshop will be carried out only with the consent of the employer and the Union on the behalf of its members concerned. • The employer reinvests the cost savings from implementation in areas that support and provide more and better jobs. • New skills or responsibilities will be rewarded with a higher salary. New technology will only be introduced if: • The total number of jobs will be maintained. • It does not benefit one group of workers at the expense of another. • Proper training is provided to employees. • Employees are rewarded for new skills. • It does not include monitoring and/or tracking functions without consent. • There are clear and fair principles for any use by employees. • There are no negative health and safety issues. • It will be implemented fairly and equitably. [18,19]
Orange (France)	The Orange telecommunications group signed an agreement on measures accompanying its digital transformation in 2016. This was allegedly the first agreement of one of the 40 companies listed on the Paris Stock Exchange which is dedicated exclusively to digital transformation. The purpose of the agreement was to highlight both the opportunities and risks presented by the digital transformation. It applied to the company's 96,000 French employees and also indirectly to each member of the group's 154,000 employees. The aim was to achieve a 'balanced position' between two contrasting approaches: accepting the digital transformation 'unconditionally' and refusing to enter the transformation at all. Orange, as a 'committed and responsible employer', sees this process as a way to improve employees' working conditions. The agreement was signed by the group and three unions. The agreement has 4 key areas, of which we mention the Social Dialogue, which is closely related to the introduction of modern technologies (other areas are discussed below). The following principles and rules are included in the field of Social Dialogue: Digital transformation is a process and, if new developments occur, the agreement needs to be changed. Transformation thus becomes the subject of social dialogue. The management of the Orange Group presents its digital affairs policy to the Central Works Council and other boards once a year. A new body, the National Council for Digital Transformation, will also be set up to act as a forum for strategic social dialogue. It will consist of management members and three representatives for each participating union. This body will work on 'potential medium and long-term aspects' and will offer its expertise to employee representative bodies. It will also monitor the productivity gains generated by digitalisation in order to channel some of these gains into improving working conditions. [22]

3.3 German ‘Arbeit 2020’ project

We will briefly consider the German project ‘Arbeit 2020’ - ‘Work 2020’ at the end of this chapter; it is not related to collective agreements, but is closely related to their content, their preparation and preparation for the introduction of modern technologies.

We can have two attitudes to the introduction of new technologies. A negative one. Or an attitude in which we will try to affect and shape these changes in the sense of minimizing negative impacts and supporting and strengthening the positive ones actively, comprehensively. German unions chose the second attitude. They perceive the challenges associated with the implementation of the ‘Industrie 4.0’ - ‘Industry 4.0’ concept for employment, work organization and working conditions and would like to affect the implementation of modern technologies. However, active engagement is not just about participating in negotiations, but about an overall strategy. That is why the German unions began to come up with support projects. One of them is ‘Arbeit 2020’ in North Rhine-Westphalia, which has been running since 2015, it is currently in its third phase and has already involved more than 60 companies. Its task was and is to raise awareness of employees’ councils about the impact of digitalisation on the workplace, improve their knowledge of changes, increase their responsiveness and, ultimately, lead to negotiating ‘agreements on the future’ with employers setting out how to address digitalisation challenges together. [23,24]

Important findings from the ‘Arbeit 2020’ project include in particular the following facts [23]:

- The changes associated with the introduction of modern technologies are continuous and build on previous changes.
- The expectation that the level of employment will fall has not been confirmed. In fact, employment in German production in general, as well as in companies where case studies have been carried out, has increased in recent years, albeit with the transition from production to administrative roles and with a sense of uncertainty about future developments.
- Only minimal degradation effects of skill and competence requirements were observed at the implemented workshops and seminars. The introduction of innovative technologies has, at least so far, created new demands on skills and knowledge, and companies are still building on skilled work. However, this does not mean that digitalisation will not have a negative impact on workers’ skills in the future.
- Companies were far from responding adequately to the need to develop the skills and knowledge needed to meet new and growing demands.
- Deteriorating working conditions were observed and a growing burden on workers was observed. This may be partly related to the increase in the level of digitalisation and automation, as well as insufficient staffing, harsh cost measures, budgetary pressures and frequent overtime.
- Workshops and seminars with employee councils found that the biggest concerns and current employment threats were in most cases not related to digitalisation or

technology, but to their experience of competition, possible operation relocation and, in a few cases, serious problems with their employer.

- ‘Digitalisation maps’ drawn up in each department of the company and analysing individual workplaces seem to be important. The maps were created in collaboration with professional consultants and advisers. They have proved to be an important tool for transparently showing how digitalisation works in practice at the workplace level and what the challenges are. In this way, the maps formed the basis on which works councils could gain knowledge and assess the dynamics of technological change and its impacts. The acquired knowledge can then help in the management of future measures.

We perceive the ‘Arbeit 2020’ project as inspiring in many ways. Conclusions, experience and outputs (e.g. digitalisation map, articles, etc.) from the ‘Arbeit 2020’ project can, in our opinion, help in many ways with successful preparation for future changes, successful preparation of the content of collective agreements or implementation of the ‘partnership’ process in digitalisation, automation and robotics, the process of introducing modern technologies in general, which we described in this chapter. More detailed information about the project, accompanying materials and a ‘digitalisation map’ in digital format are available on the ‘Arbeit 2020’ project website [24]. Experience and knowledge from other similar projects can also be useful.

4 Agreement on the protection of working conditions

Digitalisation, automation, robotics and modern technologies in general bring significant changes to our working lives. It should be borne in mind that the quality of working life is essential not only for the worker, but also for the employer, because productivity and the quality of work performed depend on it. It is well known that workers who are happier with their work are less likely to leave. It is also less likely that they reduce the company's productivity through absenteeism or presenteeism (presence at work with insufficient productivity due to poor working conditions, illness, injuries, etc.). In connection with the already mentioned significant changes that are taking place, the quality of working life and working conditions must be strictly protected, not only to ensure sufficient productivity or quality of work, but also the health of employees. [25,26,27,28]

In the context of the protection of working conditions, the following areas, among others, are mentioned as important in connection with modern technologies, which will be discussed below:

- Education
- Quality of working conditions
- Work organization
- Remuneration of employees
- Cyber security and excessive control of employees
- Disadvantaged groups of workers
- Threats to social contact

4.1 Education (and employment)

Education is one of the key success factors in today's digital transformation, automation and robotics. It enables both employees and companies to successfully adapt to these changes. As a result, companies are given the chance to increase productivity, improve working conditions or the health of companies and thus succeed in a highly competitive globalized market environment. On the other hand, employees can keep their jobs. Education makes it possible to seize opportunities and deal with the challenges, risks and pitfalls that digital transformations, automation and robotics bring.

4.1.1 Goals and challenges

The main aim of education is to prepare the current and future workforce for the introduction and use of modern technologies and to pass on the necessary knowledge and skills. There are two key challenges we face in this context:

1. Identifying which (digital) skills and process changes need to be implemented and, as a result, select and organize appropriate training measures.
2. Facilitating access to quality and effective training and skills development while respecting the diversity and flexibility of education systems which vary by business area.

Given that training is also important for workers in terms of employment and job retention, another goal is to prevent job losses and create new opportunities through training. The challenge in this context is to set up an appropriate transformation strategy that will support employment.

4.1.2 Key principles and rules

For education and employment, as for other areas, there are appropriate key rules and principles to consider, seek agreement between partners (enterprise, employees, etc.) about them and then, where appropriate, consider including them in agreements or collective agreements. The individual principles and rules are discussed below.

Education

The measures that should be considered in education include [1,8,19,23,24]:

- There is a joint interest of employers and workers in contributing to up-skilling and retraining, leading to successful businesses and high-quality public services and a suitably qualified workforce.
- A commitment by both parties to increase the skills of or retrain workers to take advantage of opportunities and meet challenges.
- Employer and employee representatives should assess and identify the training needs associated with digitalisation for the business or sector and its workforce. Social partners can play a supporting role for businesses in their efforts to develop skills plans to suit ongoing and future changes.

Digitalisation map

The digitalisation map, which was created within the German 'Arbeit 2020' project summarized in more detail in the previous section, could find application in connection with the previous point. Digitalisation maps are developed in each business department and analyse individual workplaces. They are created in cooperation with professional consultants and advisers and are a transparent tool showing how digitalisation takes place in practice at the workplace level and what the challenges are. In this way, the maps formed the basis on which works councils could gain knowledge and assess the dynamics of technological change and its impacts. The acquired knowledge can then help in the management of future measures. A model digitalisation map can be seen in the following figure (Figure 24).

Fig. 24: Digitalisation map [24,29,30]

Each workplace of the company has its own rating (grey boxes). The impact of technological changes on 3 areas (green, grey and red circles) are monitored within evaluation: 1. Employment - number of employees; 2. Required qualification and 3. Workload. Furthermore, the degree of interconnection of technologies (blue scale - no interconnection on the left, growing connection beyond the place/workplace on the right) and the degree of control using technology (brown scale - control support on the left, the process is controlled by technology on the right).

- Given the pace of changes in the labour market, regular assessment of workers' existing skills and the identification and anticipation of future skills needs are crucial.
- Ensure access to and organization of training in accordance with various national and industrial rules, training procedures and considering the diversity of the workforce, funding opportunities, competence development plans, etc. Training rules and conditions for participation need to be clearly formulated, including duration, financial aspects and employee engagement.

- If the employer asks the worker to take part in job-related training related to the digital transformation of the business, the training is paid for by the employer or in accordance with a collective agreement or national practice. This training can take place internally or outside the workplace and takes place at appropriate and agreed times for both the employer and the worker and, if possible, during working hours. If training takes place outside working hours, adequate compensation should be provided.
- Focus on quality and effective training: This means providing access to appropriate training that responds to the identified training needs of the employer and employee. A key aspect in the context of digital transformation is the training of staff to enable them to make the best use of the digital technologies being introduced.
- Arranging training that provides skills that could support mobility between and within sectors.
- Internal or external training validation solution.
- The functioning of systems, such as short-term work, which, in precisely defined circumstances, combines reduced working hours with training.
- Motivation of employees to participate in training should be supported in all steps of the up-skilling process. In this context, the engagement of social partners at the appropriate level, as well as personnel and line managers and employee representatives and works councils, is important.

Careful design of appropriate measures in education is important because this area is often insufficiently addressed, much underestimated and is one of the areas where savings are made. It is again proven by the findings from the 'Arbeit 2020' project. The workshops revealed a number of problems such as failure to carry out a systematic assessment of training needs, problematic planning for further training, training for all key areas was not carried out in some cases, training was insufficient when new software was introduced. These deficits were mainly attributed to companies' cost reduction strategies. Unfortunately, the cost of training and education is one of the first areas to be cut when it comes to saving, which is confirmed, for example, by research from the United Kingdom. However, this fact can subsequently affect employment in the company. [23]

It is also important to realize that physical and routine tasks are being replaced by machines, while intellectual and social tasks and the use of ICT are increasing. Replacing machine work can also lead to labour intensification. This may be difficult for some employees to cope with and may create psychological pressure and stress, which is why it will be important to focus on training in this area. [19]

Employment

In terms of employment, the agreement should encourage partners at the appropriate levels to implement digital transformation strategies in the sense of a partnership approach. Social partners should consider measures at the appropriate levels to ensure that the impact on employment is well expected and managed and that the strategy supports job retention and

creation. It is essential to consult the implementation of modern technologies with workers and their representatives to build trust in the entire process.

The measures that should be considered in employment include [1,8,19]:

- Strategies should ensure that the implementation of digital technologies benefits both business and workers.
- The aim of digital transformation strategies is to prevent job losses and create new opportunities, including job redesign.
- Ensure the conditions for the digital transformation of businesses leading to job creation, including the commitment of employers to introduce technology in a way that benefits employment, productivity and work content, and improved working conditions.
- Encourage employee transitions within businesses and more broadly between businesses and sectors through investment in skills that ensure skills upgrades and sustainable employability and resilience of businesses.
- Retraining and up-skilling so that workers can move to new jobs or adapt to redesigned jobs within the business under agreed conditions.
- Job redesign so that workers can stay in the company in a new role if some of their tasks or jobs disappear due to digital technology.
- Rework the work organization, if necessary, considering changed tasks, roles or competencies.
- An equal opportunities policy to ensure that digital technology benefits all workers. If digital technology contributes to inequalities between women and men, for example, the social partners must address this issue. The same is true for low-income groups, for which 'digital connectivity' can be problematic due to a lack of funding.

4.1.3 Best practice examples

Best practice examples are presented again in the following section:

Tab. 2: Best practice examples - agreement on training and job protection

Subject/ Sector	Solution
SEAT (Spain)	Under a collective agreement between Seat and the unions, the two partners agreed that, in order to respond to the needs required by industry, the company would develop a general training model for employees who wish to use it voluntarily and be taught outside working hours, whether at the beginning or end of the working day. The costs of organizing and implementing the training will be borne by the company, as well as the costs of catering or transport to the training site. The aim of this training is to acquire highly qualified and specialized staff in the field of future technologies and thus move to a digitized and interconnected industry that prioritizes the competitiveness of the company and the efficiency of industrial processes in research and development, management, production, marketing, etc. [31]

Robert Bosh (Aranjuez, Spain)	The collective agreement concluded for 2015-2017 in the Spanish branch of Robert Bosch contains, inter alia, the following provisions concerning employment and training: 1. … In accordance with the applicable regulations, the company is committed and employees accept - appropriate steps to transform employees, adapt them, use appropriate sociological and training techniques to new productive needs, all in such a way that no one becomes 'obsolete' due to technical progress, thus reducing the risk of possible technological unemployment. 2. Given the need to restructure services and jobs, the transformation of the staff concerned will be addressed in the following spirit: • Transfer of workers from indirect positions to direct positions. • Transfer of employees from atypical positions to positions typical for the company. • Training of these workers in the techniques of their new positions. • Training in general of all staff affected by technical progress and organization for the satisfactory fulfilment of their mission. 3. Those affected by the transformation will not lose the level they have achieved and will retain their basic salary and fixed salary bonuses they had, while the rest of the remuneration concepts will correspond to what is determined with regard to the position they occupy. 4. The transformation process will be carried out by the company's training and psychological services in cooperation with representatives of the company's employees. [32]
OTIS (Germany)	OTIS, which develops, manufactures and sells lifts, escalators, etc., recognizes in the collective agreement that continuous qualification of employees is essential for the long-term competitiveness and future success of the company, and therefore offers for employee training should be offered on a consultative process basis agreed between the employer and the works council. If the organization of work changes with regard to the Industry 4.0 concept, the employees concerned are entitled to up-skilling in order to avoid staff reductions and to secure employment. [33]
Insurance group (Spain)	The Framework Agreement on Transformation and Employment, signed by a Spanish insurance company, contains a first point on 'training and development for transformation'. The key idea is that the process of digital transformation of the company has an impact not only on the dynamics of job loss/creation, but in principle on the development of existing jobs. Against this background, the agreement stipulates that 50% of the annual training budget will be allocated to the training of staff in critical skills and knowledge that are expected to be necessary for providing future products and services. [33]
BMPS (Italy)	The agreement concluded between the staff and Banca Monte dei Paschi di Siena (BMPS) also deals with staff training programs to adapt skills to

	changing internal and external contexts. The goal of retraining is to strengthen business and customer support. The agreement strengthens the logic of diversifying and personalizing training using the principle of employee clusters (top management, management, middle management, core) and the training focuses on the areas that the clusters need most, such as risk measurement. It also introduces important new features aimed at facilitating the easier access and subsequent usability of training through a combination of integrated tools (classroom, online, webinar, etc.) and methods of implementation (protected time and use in the 'agile work' mode). [33]
HHLA (Germany)	The HHLA (Hamburger Hafen und Logistik) works council came up with the corporate concept of multiple qualifications. The concept was also welcomed by the company's management. This concept was promoted especially in the CTA subsidiary managing the Altenwerder container terminal, because there is a high degree of automation. It is possible to obtain more qualifications in CTA instead of two to seven activities. On the one hand, the goal of the concept is more qualifications, which would have health benefits - unilaterally stressful activities are reduced by adding others. In addition, there is the possibility of introducing more diversity into the work process. As described above, some employees evaluate the work routine positively. However, the experience of the participants involved was such that positive experience prevailed after the completion of the qualification for the next position. Routine is important, but it should not lead to boredom. On the other hand, multiple qualifications also protect employees from the possible loss of employment that can occur by replacing work with automation. Ultimately, this measure also has benefits for the company. In addition to the positive health determinants that benefit employees, they can also be used more flexibly in a variety of jobs to better compensate for short-term vacancies. However, the meaning of multiple qualifications was not understood by everyone at the beginning, because they perceived the offer of further qualifications as imposing an obligation rather than an opportunity for further development, which showed the importance of communication. [33]
Insurance Reale Group (Spain)	The agreement between employees and Reale Insurance Group recognizes that training is a crucial factor in increasing the company's competitiveness, contributing to adaptation to new forms of work organization and technological change, and development and innovation in the insurance industry, and in short enables the company's goals to be achieved. [31]
Orange (France)	The Orange Group's collective agreement defines, among other things, the level playing field, which contains the following principles: The signatories undertake to ensure that digitalisation 'does not exclude anyone from the work process'. The first risk identified in the agreement is 'digital fission'. The agreement guarantees that there will be a joint knowledge base plus the time needed to acquire it, so that the employee can become a fully independent user of digital tools. Orange will develop personalized learning defined by 'digital self-diagnostics', which will make it possible to draw up an evaluation

	report. Each employee will be able to determine their level of autonomy and use the various available methods of development, including training. These tests will be performed on a voluntary basis and consolidated results will be provided to employee representatives. The agreement also calls on the company to make the transition to managed cooperation based on greater trust. [22]

4.2 Quality of working conditions

The use of modern technologies significantly affects the quality of work and occupational safety and health (OSH), both in a positive and, unfortunately, in a negative sense. The European Agency for Safety and Health at Work has identified the challenges that digitalisation poses to the physical and mental health of workers. Some positive aspects of using ICT tools are mentioned, such as:

- Teleworking can contribute to well-being and work-life balance and can also help reduce the risk of accidents.
- The use of ICT could also help reduce the work of people in dangerous environments or better protect them by automating dangerous and/or monotonous repetitive tasks.
- We can also see indirect benefits in the form of more effective sharing of good OSH practices, providing quality training, keeping and sharing safety violation records.

However, there are also a significant number of negative impacts and risk areas related to the introduction of modern technologies identified by the European Agency for Safety and Health at Work. The use of ICT resources is often associated with physical inactivity, which brings several risks:

- The use of computers and automated systems at work leads to firm posture and physical inactivity. This can lead to increased health risks, such as coronary artery disease, overweight or obesity, certain cancers and psychological disorders such as depression and anxiety.
- Another important risk to physical health is the combined exposure to a mixture of environmental stressors, which together increase the risks of musculoskeletal disorders, the root causes of illness and incapacity for work.
- Devices can potentially pose health and safety risks associated with exposure to electromagnetic fields.
- The central management of mobile devices is often addressed at a high level in companies, but ergonomic aspects are often not regulated. Eye strain, muscle tension or postural problems can occur especially in the case of devices with small displays. In general, the risks of musculoskeletal disorders increase.
- With regard to the growing complexity of new devices or the move to stations and workplaces for remote control (for example, the number of monitored monitors is growing - parameters, controlled panels, etc.), there is also a risk of insufficient

ergonomics in these cases. However, in addition to musculoskeletal disorders, there may be a risk of a slower or poor reaction of workers.

- A similar situation applies to IT systems as a whole, including software. No one was much concerned with ergonomics in software in the past because other factors such as compatibility, functionality, price, etc. were put first. According to a Swedish survey from 2013, 78% of Swedes work with a computer, of which 45% work with a computer for more than half a day and 20% use it all day. In the same study, it was found that in 77% of cases some form of improvement or a plan of activities aimed at further updating or the process of purchasing a new system is required when performing IT system inspections from the point of view of work safety.

[19,23,34,35,36,37]

Emerging significant psychosocial risks are also identified. Flexible working patterns and a 24/7 economy can lead to workers facing increasing workloads and task complexities. Working conditions are also significantly affected by the effort for the high level of use of expensive equipment and technologies, which can often lead to excessive working hours. Employees are also under pressure to solve software problems or to manage a large number of poorly integrated systems. As a result of replacing personal communication with virtual communication, feelings of isolation may arise (for more details, see the next part of the study). Finally, it may be increasingly difficult to achieve a good work-life balance, partly due to work pressure, but also due to the 'fear of loss' syndrome. As a result, there is a danger that workers may suffer from stress and burnout and also face increased emotional demands, including violence, harassment and bullying. One recent UK survey found that more than 50% of absenteeism in the UK is due to work-related stress. [19,36]

The introduction of modern technologies can also lead to a change in work style and different work organization. It is necessary to prepare for this fact and provide workers with appropriate training (see education issues), give workers enough time for such training and to adapt to new working conditions. [19,23]

In connection with the growing use of modern technologies, especially IT systems, it is necessary to address their functionality and availability, which also significantly affects the quality of working conditions. One recent UK study found that more than 25% of workers had problems with their computers at least once a week. The availability of work data is also important. [36]

The use of artificial intelligence, machine learning and process automation will also have a significant impact on the work. While these systems have valuable potential for increasing business productivity and labour well-being and better division of labour between people, between different parts of business and between machines and people, it is also important to ensure that systems and solutions do not endanger safety, improve working conditions, human engagement and working capacity. People's control over machines and artificial intelligence in the workplace should be guaranteed and the use of robotics and artificial intelligence applications should be supported while respecting and adhering to safety regulations and safety controls. [1]

4.2.1 Goals and challenges

Insufficient measures in this area can again lead to psychosocial or, in some cases, physical problems for workers. Due to poor adaptation, for example, there may be a risk of bad work decisions. However, poorly set measures can also lead to low productivity or poor-quality work. Alternatively, additional risks may arise.

Therefore, the aim is to set rules and measures in this context so as to ensure, in particular, occupational safety and health and, in particular, to ensure that workers have quality working conditions in the form of functional equipment and the availability of work data.

4.2.2 Key principles and rules

The measures that are appropriate to consider in terms of the quality of working conditions include:

- Before the implementation of new technologies, IT systems, workplaces, equipment, etc.
    - Perform an evaluation. In this context, it is possible to create maps similar to the digitalisation map mentioned in the previous part of the study.
    - Involve relevant employees, such as users, IT developers, etc.
    - Focus on potential safety, health impacts, usability, functionality, influencing the way of work. Whether the new IT system will manage our work, what the real needs are, how can we ensure that the system responds to our needs.
- For existing technologies, IT systems, workplaces, equipment, etc.
    - Perform an evaluation. In this context, it is possible to create maps similar to the digitalisation map mentioned in the previous part of the study.
    - Involve relevant employees, such as users, IT developers, system buyers, etc.
    - Focus on mapping how many there are, what their safety is, health impacts, how they interact, what the problems are in use, whether workers are adequately trained, what the procedures are and what happens in the event of an error or accident, whether systems are available for monitoring and management.
- As part of the deployment of artificial intelligence systems, machine learning, process automation
    - Partners should recognize the importance of using these technologies and should actively explore the potential to increase business productivity and labour well-being, including better division of tasks, expanded competence development and work capacity, reduction of exposure to harmful working conditions.
    - These technologies should be legal, fair, transparent, safe and secure and in compliance with all relevant laws and regulations, as well as fundamental rights and non-discrimination rules.
    - They should be robust and sustainable, both technically and socially.

[1,18,36]

4.3 Work organization

Digital technologies have increasingly enabled employees to work from almost anywhere in recent years. Thanks to smartphones, tablets, light and powerful laptops, fast fixed and mobile internet, cloud applications and communication or other means, employees no longer have to be constantly present at the workplace but can also perform their work on the road or from home. Unfortunately, the problem of 'unlimited' availability of employees outside working hours, on weekends and holidays has spread due to this fact. This fact is often abused because many of the business issues being addressed 'cannot wait'. While it is true that work and personal life of some employees coincides and they do not mind such situation, it is important to realize that each employee should have the right to self-determination of life and work within reasonable limits. Moreover, although people whose personal and professional life coincides often do not perceive it, insufficient work rest has a negative effect on their work performance and can ultimately lead to health problems. Modern technologies also have a significant effect on speeding up work, which can and often does lead to greater work intensity. [19,35]

Another problem that is closely related to the problem of unrestricted availability is the fact that employees are increasingly bound by targeted agreements. In fact, their work is not limited by time, but by the results of their work. The ability to manage one's own work is automatically increased and the employee's flexibility to switch between personal and professional life is often increased in this way, but at what cost? This is because stress and the risk of being overloaded with unlimited work without rest often grow, and also at the cost of on-call time or unpaid overtime. These facts are often no longer addressed in any way within the framework of employment or collective agreements. [19,35]

Just as we are talking about the negative benefits of digital technologies in connection with work organization, we must also highlight their positive benefits. Digital technologies allow and significantly facilitate working from home in places where we would often not have been able to imagine it in the past, thus significantly contributing to better work-life balance. However, this area also needs to be defined in an appropriate way in (collective) agreements.

In connection with work organization in the time of digital transformation, it is necessary to extend the co-decision of workers over their working life and to enshrine it in collective agreements and company regulations. Workers need to be given a reasonable degree of individual freedom in determining the time, place and organization of work, in order to protect workers from an excessive removal of the imaginary boundaries between flexibility and work intensification. It is also appropriate to give workers more flexibility in choosing their place of work where this was not possible before. Undoubtedly, it must be added that there are ways and tools to define everything correctly. An example can simply be a more appropriate definition of working time, e.g. in the form of the use of flexible working hours and their firm anchoring in the employment contract.

4.3.1 Goals and challenges

The presence or introduction of modern technologies in the workplace can provide many new opportunities and possibilities for flexible work organization for the benefit of employers and

workers. It can also create risks and challenges regarding the definition of work and personal time during and outside working hours. In this context, it is therefore in the interest of employers and workers to adapt, if necessary, the work organization to the ongoing transformation resulting from the use of modern technologies.

4.3.2 Key principles and rules

The measures considered include the following [1,18]:

- The employer's obligation to ensure the safety and health of employees in all aspects related to work. In order to avoid possible negative effects on the health and safety of workers and on the functioning of the company.
- The focus must be on ensuring a safe and healthy working environment through a system of defined rights and obligations.
- Respecting the rules of working hours and teleworking rules and mobile work rules.
- Providing guidance and information for employers and workers on how to respect working time rules and teleworking and mobile work rules, including how to use digital tools such as emails, including the risks of overconnections, in particular from a health and safety point of view.
- Be clear about the principles and agreed rules for using digital tools for private purposes during working hours.
- The commitment of management to create a culture that avoids contact outside of working hours.
- Work organization and workload, including the number of employees, are key aspects that need to be jointly identified and evaluated.
- Achieving organizational goals should not require an off-the-job connection. With full compliance with legislation and working time provisions in collective agreements and contractual arrangements, the employee is not obliged to contact the employee at any additional off-the-job contact (e.g. when receiving an email outside working hours).
- If off-the-job contact is necessary, the employee must receive adequate compensation for the extra time worked.
- Establishing warning and support procedures to find solutions and protect against harm to workers for not being in contact.
- Regular exchanges of information on workload and work processes between managers and employees and their representatives.
- Prevention of isolation at work.
- Other appropriate measures to ensure compliance with the principles set out here.

4.3.3 Best practice examples

Several best practice examples of solving the problem in the form of unlimited work or working hours are mentioned below.

Tab. 3: Best practice examples - work organization agreement 1

Subject/ Sector	Solution
France Télévision (France)	This example could be called Disconnection Right Negotiation and comes from France, where discussions on the right to disconnect began as early as in 2010. A national interprofessional collective agreement indicated that the right to 'disconnected time' is one possible way of work-life balance in 2013. This solution has even been implemented in some companies. A review of the Labour Code was carried out in 2016, where the right to disconnect from all employees appeared. It includes the obligation for each company with 50 or more employees to negotiate the 'use of ICT' to ensure that workers' rest and leave periods and their personal and family lives are respected. Given the fact that there are a large number of labour regulations in France, the exact details of implementation are left to specific negotiations. The law stipulates that circumstances under which employers may or may not require workers to be available to answer telephones or to respond to emails or other electronic messages outside working hours or during rest periods between working days should be a mandatory topic of collective bargaining at the company level. If employers and trade unions cannot agree, the employer is obliged, after consulting the employees' council or employee representatives, to draw up a charter setting out how the right to disconnection will be exercised. The widely acclaimed collective agreement of 2017 between the public broadcaster France Télévision, the Confederation of Trade Unions and the trade unions includes the right to immediate disconnection. The collective agreement, in accordance with the current rules on on-call time, guarantees that no employee will be obliged to respond to emails or other messages outside normal working hours and explicitly states that no disciplinary action can be taken against the employee. If it is necessary to contact employees outside working hours, the contact must be justified by the demonstrable urgency or exceptional importance of the matter. Other related provisions recommend that employees turn off their devices outside of normal working hours and ensure that all emails written in personal time are sent only during working hours. [21,38,39]
State (Italy)	A similar situation as in France occurred in Italy, where the parliament approved Act No 81/2017 regulating employment conditions relating to 'work based on mobile technologies' in May 2017. The Act introduces the concept of 'smart work' as a work regime linked to goals or steps rather than to pre-determined working hours and space, which is intended to increase competitiveness and promote work-life balance. Specific arrangements for 'smart work' must be agreed through individual agreements setting out the following: rules for performing work outside the office; methods for ensuring control and disciplinary authority of the employer; work tools used by the employee; measures to ensure rest and the right to disconnect. [19,40]
BMW (Germany)	Some examples with regard to company-level agreements on 'the right to disconnection' were also implemented in a number of major car companies in Germany, where agreements were concluded between trade unions and employers. German car manufacturer BMW reached an agreement with its

	works council in January 2014, stipulating that all employees can record time spent working outside the employer's premises as working time, which opens up the possibility of compensating overtime for time employees spend responding to emails after their normal working day. In addition, employees are encouraged to agree on fixed 'availability times' with their supervisors. [19,41]
Daimler (Germany)	Similarly, German car manufacturer Daimler introduced a new policy that allows employees to set their mailbox to 'holiday mode' during the holidays; this software allows automatic deletion of all incoming emails during the holiday period. The sender will receive an automatic reply stating that the emails will be deleted during that period and will be prompted to contact another employee during that period. [19,41]
Bosch (Germany)	Another good example is the innovative collective agreement between Bosch and IG Metall unions. It is related to this area only to a certain extent, but in our opinion it is in many ways inspiring in relation to it. This is an example from Germany from 2018. Instead of outsourcing the new Connected Mobility Solutions division as an independent start-up for mobility services, Bosch negotiated an innovative collective agreement with IG Metall, which should also serve as a possible solution for the future within other parts of Bosch. Approximately 300 employees of the new Bosch division will be able to choose to work 35, 38 or 40 hours per week since 2019. Employees can decide for themselves when and how much they will work. Salary bands exist instead of fixed salary groups. In addition, each employee will have a training budget. Employees will also be able to undergo a comprehensive health check every two years, an advantage usually reserved for managers. The negotiated collective agreement is based on ordinary agreements with IG Metall, but offers greater flexibility, freedom and self-determination for employees. This collective agreement creates the right framework. On the other hand, two worlds collide. There are only a handful of specialists around the world in some areas and getting them and keeping them is one big challenge. The company may lose competitiveness through a collective agreement and related restrictions. [42,43]
Orange (France)	The agreement of the Orange telecommunications group from 2016 on measures accompanying its digital transformation contains 4 key areas, here we will discuss two (see the previous part of the study for other information). The agreement shows that Orange's management has recognized the risk of permanent employee connections, leading to increased workload and reduced rest periods, which can be detrimental to health and safety at the workplace. The following principles and rules are included in selected areas: Right to disconnect - The agreement states that 'respect for privacy and the right to disconnect are considered fundamental rights of Orange'. It is about protecting employees from 'disruptive practices' (such as emails, text messages or instant messaging services) 'at any time of the day or night, on weekends, days off or during training' coming from managers but also from colleagues, etc. The agreement provides for automatic mechanisms, such as stopping servers, to protect employees' privacy. To avoid exposing

	employees to psychosocial risks or facing a paradoxical situation, Orange encourages employees not to use their email service or other communication tools during rest periods or on days off. Managers also organize periods in which employees are encouraged to talk to each other to avoid bombarding employees with emails. Employees are also encouraged to reserve periods during which they will not use the electronic messaging service during the working day, for example during meetings or to facilitate concentration. Excessive consumption - As a precautionary measure, the agreement provides employees with the opportunity to have a 'quantitative personal report on the use of digital resources' sent to them on a voluntary basis each year. A collective report can also be passed on to the team to identify 'daily over-consumption' or unusual use of digital tools in the evenings or on weekends. All employees responsible for safety and health in the workplace will be trained to identify the risks associated with the inappropriate use of these tools (such as problem identification or hyperconnectivity) from now until 2018. Measures were planned to encourage the correct use of digital tools, such as a day without email or pop-ups reminiscent of basic rules, with questions such as: 'You are about to send an email at 11 PM. Would it be possible to send it during normal working hours instead?' [22]
Pôle emploi (France)	Pôle emploi is a French government agency that focuses on registering the unemployed, helping them find work and providing financial support. This agency also decided to adjust the use of digital communication tools within the framework of collective agreements in cooperation with trade unions in 2017. The key principles are mentioned below. Any employee absent for more than 5 days (leave, training, etc.) is asked to activate an absence message informing the sender that the message will not be processed. For convenience, Pôle Emploi undertakes to upload a universal message into the system. In order for the employee to be able to deal with the received messages upon return, he or she does not attend meetings with clients during the first half of the day, unless an urgent task requires it. An employee contacted outside working hours, working days or during holidays is not obliged to respond, except in cases of force majeure. No sanction may be imposed for such conduct, subject to the conditions set out in the agreement. The manager must refrain, except in cases of force majeure, from contacting employees or sending personal messages outside working hours, during holidays, etc. In order to raise awareness of staff rest periods, the agency will (if technically possible) take measures on messages sent between 8 PM and 7 AM for both senders and recipients: a return email will be sent to the sender reminding him or her that the message has been sent outside normal working hours and that he or she cannot expect an immediate response from the partner(s) and that only urgency can justify sending an email outside normal working hours; for the recipient, the received email will contain a note indicating that the message was sent outside normal working hours and that he or she is therefore not obliged to reply to it and/or act on it before the start of the next working day.

	In order to increase awareness of these practices, the parties agree that an evaluation of emails sent outside working hours will be carried out after one year of application of this agreement. [19]

We can also add one of the successful examples of how working from home was made possible and the basic rules for its use were set:

Tab. 4: Best practice examples - work organization agreement 2

Subject/ Sector	Solution
Pôle emploi (France)	Within the framework of the collective agreement mentioned above, Pôle Emploi also defined the rules of teleworking after an experiment carried out in 7 of its facilities in 2015-2016. The aim was to make it easier for employees to combine work and personal life. This scheme is open to all interested parties, subject to the following eligibility criteria: the worker must have worked indefinitely at Pôle Emploi for at least 3 years, must have worked at least 80% full-time, and the necessary practical conditions must be met (e.g. adequate household insurance, internet and telephone coverage, compliance with regulations - e.g. use of electrical appliances, etc.) must have the consent of their manager. Teleworking is only open to activities that are compatible with this form of organization, that do not require close managerial support, that can be performed remotely for at least one day. The agency provides and maintains the equipment needed for teleworking and bears the costs directly resulting from the performance of teleworking. The possibility of teleworking is available for a maximum of two fixed days a week for employees (including managers) who do not exercise supervision. Teleworking is possible for one fixed day a week for employees without supervision (including managers) whose working hours are 80%. For superiors, telework is possible one day a week, divided into two half-days, which can be scheduled differently each week. [19]
Generali Group (Spain)	Both parties recognize that teleworking is one of the innovative forms of work organization and performance derived from advances in new technologies that enable the implementation of work activities outside the company's premises. As a result, group companies may implement a teleworking system or scheme after prior information and consultation with the group's trade unions. In doing so, the following must be respected: the provisions of Article 13 of the teleworking statute and Article 20 of the General Telework Convention, as well as the following criteria: (i) Voluntary and reversible nature of teleworking, both for employees and companies In the group; (ii) Equal rights, legal and conventional, of teleworkers with respect to comparable staff working in the company's facilities; (iii) Convenience of regulating aspects such as privacy, confidentiality, risk prevention, equipment, training, etc. These are reflected in the content of the 'Declaration on Telework' signed by the European social partners in the insurance sector on 10 February 2015 and the declaration signed by Generali

	with the European Works Council of 16 May 2017 on the promotion of teleworking. [31]
BMPS (Italy)	An experimental phase for the introduction of the so-called 'agile work' (teleworking from home) was launched at Banca Monte dei Paschi di Siena in 2017 on the basis of an agreement between the company and the trade unions. 'Agile work' is provided a maximum of one day a week and workers have access to agile work on a voluntary basis with prior authorization and using IT tools provided by the company. However, this opportunity is available to a limited number of staff: for those working in the back office and in general management activities in central structures, but it is not provided to those working in territorial branches (they have 'agile work' provided only a few days a year for online training from home). [44]
Insurance Reale Group (Spain)	The collective agreement (2017-2020) signed by the Spanish insurance company Reale also deals with teleworking. The agreement recognizes telework as a way of prioritizing work-life balance. Teleworking is permitted on the basis of the following principles and criteria: • Voluntary principle for both employees and company. • The principle of reversibility for both employees and company. • The principle of equality with regard to employees who perform their duties in the company's facilities. • Criteria for adapting the function, that is, work can be done through teleworking. [44]

4.4 Remuneration of employees

Remuneration of employees, which has always been complicated, naturally is closely related to work performance. However, in view of the changes that are taking place, it is becoming more and more problematic in our opinion, although many employees may not be aware of it. In addition to what was mentioned above, that work unlimitedness widens significantly and targeted employment agreements are expanding with digital technologies, which are not limited in time but work results, there are other factors that complicate remuneration. Among other things, this is work from home, for which it is difficult to monitor how long it really takes employees in real life to complete their tasks. There is a change in the nature of work, which is performed more and more in complex work teams, in some cases is strongly based on know-how and knowledge of employees, uses digital tools and strong sharing of work outputs or work performed. In addition, employees are increasingly working in parallel on the same output (model, file, program, etc.). Thanks to the action of all these and other factors, there is an even greater problem compared to the past with the objectification and measurability of work performance, knowledge used or employee engagement in work, often complicated with regard to the time actually spent. [45]

With regard to the knowledge used, we could perhaps state that it is being exchanged, although even this statement is not entirely fair. We could use various automatic means to monitor the work of employees or the changes made to the outputs, on the other hand, this would undoubtedly be resisted by many employees, and it is generally questionable whether it is

desirable. Another problem is the fact that these solutions would require additional human capital to evaluate the records from these means. In our opinion, it is one of the areas that is difficult to address in collective agreements. The question therefore arises as to whether it is not better to look for various flexible solutions at the core of a more positive and motivating nature.

4.4.1 Goals and challenges

The aim is to ensure objective and fair remuneration of employees.

4.4.2 Key principles and rules

Key measures, principles and rules include, for example:

- Creation of salary bands.
- Remuneration considering self-assessment by the employee.
- Entitlement to a training allowance.
- Choice of the number of working hours.
- …

4.4.3 Best practice examples

Although we do not have a directly proven example of a solution for this area, it can be based on some of the ones already mentioned. An example is the collective agreement between Bosch and the IG Metall trade unions. Where we perceive as important, for example, the possibility of our own choice of the number of hours worked per week and the use of salary bands. Also essential is the training allowance, which actually gives each employee the opportunity to learn and grow and gain new job knowledge. The possibility of remuneration in regular time cycles on the basis of self-evaluation of the employee, which contains a summary of implemented work activities for a given period and evaluation of his or her contribution, seems to be interesting. [42,43]

4.5 Cyber security and excessive control of employees

The growing use of digital technologies or the use of work from home significantly increases the risk of cyber attacks to misuse corporate or private (e.g. employee, client) data or, in extreme cases, to control and manage the attacked entity (e.g. facility or system) and consequently either damage the system or, for example, achieve the production of degraded products.

One of the critical elements in a first-line cyber attack is the employee and his or her behaviour, which can significantly affect the success of the attack. The employee is thus in an unpleasant situation, where due to his or her mistake, even if unintentional, there may be data leakage and the employer or insurance company can then recover the damage from the employee. Employees should therefore be entitled to appropriate training to know how to behave in cyberspace and what the correct working procedures are (e.g. locking the PC when leaving the room, not transferring company data to private devices, not opening fraudulent emails, etc.). The approach of the company itself and its efforts to secure also play an important role. Employees should require the employer to use at least commonly available security options and means, such as accessing a PC using a password, locking disks, using antivirus tools, firewalls, etc., to minimize

potential hazards. The administration of access to computers, to the computer network, to both corporate and employee data or to client data should also be consistently addressed. Not only with regard to the danger from the outside, but also with regard to the danger from the inside, because there is also a growing risk of excessive control of employees by the employer using ICT technologies.

It is also necessary to clearly define the rules and procedures determining which data, for example, on employees, customers, etc. need to be acquired, protected and how.

As the use of social media in companies expands, it is necessary to think about this area as well. Many companies started to use social media quickly and successfully, even though the rules for their use have not been clearly defined.

[1,35]

4.5.1 Goals and challenges

Naturally, it is difficult to strike a reasonable balance between data protection with a certain freedom of employees or between security and excessive control by the employer. That is why it is important that this area is also addressed comprehensively within the framework of collective agreements, and not only at the internal level of the company, so that it does not burden specific individuals. Therefore, the aim is to ensure adequate cyber security and to reduce excessive control of employees and collection of data on them.

4.5.2 Key principles and rules

The measures considered include the following:

- The partners agree that digital technologies and AI surveillance systems, together with data processing, offer the opportunity to secure the work environment and ensure healthy and safe working conditions and improve business efficiency. At the same time, however, they increase the risk of endangering human dignity, especially in cases of personal surveillance. This could lead to a deterioration in working conditions and the well-being of workers.
- Ensuring the safety of all equipment from potential hazards. Training of employees in terms of cyber security and their rights and obligations.
- Ensuring that only specific and agreed locations are monitored and that the use of in-vehicle cameras and data collected from workers' digital bracelets are regulated.
- Establishing more specific rules (allowed by Article 88 of the GDPR) to ensure the protection of rights and freedoms with regard to the processing of employees' personal data in the context of employment relationships.
- Always link data collection with a specific and transparent purpose. Data should not be collected or stored simply because it is possible or for any future indefinite purpose.
- Enabling employee representatives to address data, consent, privacy, and tracking issues.

[1,18]

4.6 Disadvantaged groups of workers

Digitalisation, automation and robotics can pose a threat to equality for some groups of workers. It can be, for example, women, because IT professions are dominated by men. One of the ways to solve and regulate this problem is to set out in agreements - collective agreements various measures aimed, for example, at increased support for projects related to the education of women in the field of IT. Another option is to set certain quotas for male and female workers. [46]

Research also points to negative effects on black and minority ethnic employees. An example is Great Britain. In addition to improving the efficiency and quality of jobs through digitalisation, the government's cuts program has included and continues to include the reduction of first-line jobs in public services (national health, education, central and local government, police forces, etc.). These are jobs that are traditionally held by black and minority ethnic workers, together with disabled and older workers, and they are often 'detained' in them due to unequal working conditions. Workers in these groups were removed to meet staff reduction targets through draconian competency principles over the past decade. These were often workers who had performed the same administrative role for many years and, as a result of digitalisation, were told that, after restructuring, they did not have the necessary skills to move to other jobs. Given the type of jobs, there has been and is little opportunity to participate in skills development and up-skilling. In addition, when budget cuts are needed, the cost of training and education is one of the first affected. Another problem is that these workers and their jobs are also less likely to be released for training. Despite the fact that workers' unions fight back, litigation has been going on for too long and workers have long since been dismissed. Another example of the effects of digitalisation on black and minority ethnic workers is shown by the following study from 2017. A government non-departmental public organization in the UK reportedly found that traditional methods of providing guidance through a helpline are not desirable for younger people and that more advice is needed through digital methods, applications, online internet tools, etc. In reality, however, it was an excuse to reduce first-line jobs. But black and minority ethnic employees were dismissed in the vast majority of the redundancies or they were offered less qualified work. While most white workers kept their jobs. Despite the legal struggle, the employer refused to give any reason, but eventually admitted that the solution was cost-driven. [46,47]

The negative effects of digitalisation can affect, for example, older workers. It can be difficult for them to adapt to the coming changes and learn to work with ICT. Therefore, in addition to providing them with training and education, it will also be important that they have sufficient time to do so. An appropriate form can also play an important role, which should help to make this process as efficient as possible.

Another disadvantaged group may be low-income families, where digital resources can be used to a much lesser extent. These people can then suffer the consequences of the lack of ICT skills, abilities and knowledge. This can ultimately lead to unequal opportunities in companies in terms of transfer to another job or filling new ones due to digitalisation, automation and robotics. Furthermore, their insufficient home connectivity due to insufficient financial resources can be

problematic, which can lead to the employer finally rejecting such a worker due to the limited possibility of working outside the workplace.

We must also bear in mind that digital transformation, as it may in some cases jeopardize equal opportunities for all groups of workers, can also make a significant contribution to supporting disadvantaged groups and greater equality, as it can, for example, allow and facilitate work from home. In this case, we can talk especially about women on maternity leave, the disabled or in some cases injured or sick employees who would not normally be able to come to work (some cases of fractures, asymptomatic COVID-19 infection, etc.). The rules and principles for working from home must be defined accordingly. It is possible, for example, to use some of the rules and principles used for ordinary workers (see the chapter on work organization) and supplement them with those that are specific to specific groups.

4.6.1 Goals and challenges

The aim in this area is to avoid the negative effects of digitalisation on vulnerable groups of workers.

4.6.2 Key principles and rules

The measures considered can include the following (some measures are based on Article 13 of the European framework Employment Equality Directive of 2000) [1,47]:

- The partners are committed to adopting such equal opportunities policies, principles, rules and measures to ensure that digital technology benefits all workers. If digital technology contributes to inequalities, the social partners must address this issue.
- Providing training for trade union negotiators on how to use racial equality and human rights laws.
- The need to establish and use a system of discrimination control to identify, evaluate and monitor any adverse disproportionate impact on race, multiple or other grounds for equality.
- If potential or actual disproportionate effects of digitalisation on disadvantaged groups of workers are identified, positive action measures are essential to ensure full equality in practice.
- Prior to any shift towards digitalisation, BME employees must be equipped with training and development, including any positive actions, to compete for employment at the same level as their white counterparts, and employers must provide alternative safe work. The possibility of membership and engagement in employees' and employers' organizations is also crucial.
- Vulnerable groups should have representatives in important bodies.
- It allows for limited exceptions to the principle of equal treatment, for example in cases where a difference in treatment based on race or ethnic origin constitutes a genuine employment requirement.

4.7 Threats to social contact

Thanks to digital transformation and possibly other influencing factors such as the COVID pandemic, communication between employees, between employees and the company (in relation to management, HR department, etc.) and possibly also in relation to customers or other entities is significantly shifted to virtual space and there is a certain loss of social contact. As a result, new problems and challenges may arise that will need to be addressed. These problems may include [19,23]:

- Improper way of communication: People often communicate in a different way in virtual space than face to face, so there is a danger of, for example, a vulgar way of communication.
- Difficulty of communication: Collaboration through virtual means, including communication, is significantly more demanding, which can lead to stress, increased emotional demands, including harassment and bullying.
- Danger of misunderstanding: Human communication is usually accompanied by facial expressions and gestures (body language) and there is a risk of misunderstanding because these elements can be suppressed in virtual communication or they may be missing. The problem is also in written communication, where some statements may not be properly understood and their explanation is not possible, for example, immediately and in person. Ultimately, there is a risk of interpersonal problems.
- Difficult integration of employees into the work team: It is easier to establish informal relationships between employees within personal contact, which can significantly help with integration. Poorly integrated employees may not achieve adequate productivity and quality of work.
- Isolation: Thanks to digital communication and the already mentioned problematic creation of informal relationships, there is a risk that a feeling of isolation or other negative feelings such as a lack of recognition will gradually appear. This could eventually lead to stress, increased emotional demands, including harassment and bullying.
- Possible other problems.

Social contact also includes relationships with customers, clients and other entities. RPA - robotic process automation, artificial intelligence and machine learning have recently started to be used frequently especially towards customers and clients. Here we can perceive another dimension of the threat to social contact. There is a risk of limiting or preventing human intervention and contact due to the use of these technologies, which can lead to [46]:

- Wrong decisions.
- Communication of information from processes resulting in an inappropriate manner (e.g. in social services - child care, etc.).
- Denial of the meaning and essence of some jobs, types of employment or services (again, e.g. social services).
- Disadvantage to certain groups of customers who, for example, do not have access to the Internet or knowledge of its use and use of electronic services.

- Due to the lack of social contact, vulnerable groups of citizens can also become even more vulnerable (seniors, migrants, etc.) because they relied on the advice of workers.

There is also evidence from research that social workers in Sweden have already left their jobs because they felt that social care decisions were fully automated without the role of professional judgment.

4.7.1 Goals and challenges

The quality of social contact has an impact on the performance and well-being of employees. It is important to consider the quality of relationships (cooperation, integration, contact moments and opportunities, communication, work atmosphere), management style, incidence of violence or harassment, conflict management, support procedures and mechanisms. In this context, the aim is to minimize the problems and risks associated with the threat to social contact and to seek to ensure sufficient social contact.

4.7.2 Key principles and rules

In order to avoid or minimize these problems, the content of collective agreements should include provisions on the need to [1,46]:

- Define behaviour in the virtual space between employees, between employees and customers, etc. using appropriate rules and principles.
- Establish appropriate measures if the above rules are not complied with.
- Enable/ensure regular social contact to create informal relationships in the workplace in order to prevent interpersonal problems, isolation, lack of recognition, stress, mental health problems, etc. Just as rules are set for teleworking, rules can be set to promote social contact.

The measures, principles and rules that should be considered with regard to the introduction and use of RPA - robotic process automation, artificial intelligence and machine learning in the world of work include [1,46]:

- Partners should recognize the importance of using these technologies. At the same time, however, they should recognize and address potential tensions between respect for human autonomy, harm prevention, fairness and the clarity of decision-making.
- The use must be transparent and explainable with effective supervision. Control by employee should be guaranteed.
- The use should respect the principles of justice, i.e. ensure that there is no unfair bias and discrimination.
- Checks will need to be made to prevent erroneous output.
- Agreed ethical standards should be respected and ensure that EU fundamental/human rights, equality and other ethical principles are respected.
- The system should be robust and sustainable, both technically and socially - artificial intelligence systems can cause unintentional damage even with good intentions.
- Transparency needs to be ensured by providing information in situations where systems are used to make decisions about people. In addition, the person concerned may request

human intervention and/or challenge the decision along with testing the AI results. Similarly, this fact may apply to decisions about human resources in companies - recruitment, promotion, dismissal, performance analysis.

5 Agreement on the protection of workers in new forms of employment

For historical reasons, logically, permanent employees are given a higher level of protection than other forms of employment. Until recently, other forms of employment were not as widespread and there were not as many different forms as there are today. However, with the development of modern technologies, the situation is changing significantly and will continue to change, and these changes need to be adapted as part of the protection of these other forms of employment.

5.1 Employment through digital platforms

A key example is employment through digital online platforms. This includes work provided locally using applications, especially mobile ones. In this case, it may be transport or driver services provided through applications or services such as perhaps the well-known Uber or possibly its Chinese equivalent DiDi or Singapore's Grab. It also includes 'crowd' work, usually provided on a global, but in some cases also on a regional scale, through an internet web platform. This area includes services such as Amazon Mechanical Turk - in this case, a website bringing together businesses and freelancers that can hire companies for their tasks remotely through this service. A large part of the work carried out using digital platforms is part-time, temporary, occasional or self-employment, or takes the form of various agreements on performance of work. In addition, these platforms are often used by people on the margins of the labour market, such as refugees and other low-income people trying to gain a foothold in the labour market. Digital platforms are attractive to them because they do not need specific skills. [48,49,50]

5.2 Further expansion of new forms thanks to digitalisation

Other forms of employment are also supported by the development and expansion of digital technologies (smartphones, tablets, laptops, cloud computing, etc.) and communication tools (MS Teams, Zoom, Google Meet, etc.). The employee becomes more independent thanks to them. Compared to the past, the employee no longer has to be physically present at the workplace, he or she can work from home and, for example, it is easier to perform work for several entities at once. This situation can be supported in the future by the development of work task automation and robotics. Not all workplaces can, at least for the time being, be automated, which could lead to, for example, shortening working hours or reducing jobs or hiring independent workers only for specific tasks. Another form of employment, such as employee sharing, has been expanding recently due to this fact. It is a form of employment in which a group of companies employs one worker who provides their personnel needs, thus creating a full-time job for the worker. [51]

Other forms are also expanding, such as employment through employment agencies, voucher-based work, and we will most likely see other new forms. [51]

It is with regard to the above-mentioned events that an increase in workers using other forms of employment can be expected, and it is also necessary to focus on their better protection through collective agreements. After all, a gradual increase was already seen in previous years (Figure 25). The spread of new forms may also occur due to the fact that automation will be possible at least for some tasks, which can lead to part-time work, which people will most likely want to compensate otherwise, such as using platforms.

	2006	2010	2014
AT	34.6	37.4	39.1
BE	34.5	35.7	36.5
BG	11.6	12.3	13.3
CY	26.4	27.0	34.5
CZ	21.1	23.3	24.4
DE	39.9	40.9	40.3
DK	32.1	35.4	34.3
EE	13.2	15.7	14.7
ES	44.9	39.3	41.5
EU-28	35.1	35.7	36.4
FI	32.1	30.5	31.1
FR	31.8	32.6	33.4
GR	30.8	33.1	37.9
HR	25.7	25.7	25.0
HU	15.7	19.2	19.8
IE	28.2	34.3	35.5
IT	35.4	36.3	38.8
LT	21.6	15.3	17.7
LU	25.5	25.5	28.3
LV	16.1	19.8	14.8
MT	22.8	22.7	27.0
NL	54.3	59.0	62.0
PL	40.4	39.1	39.3
PT	32.6	34.1	32.5
RO	22.4	24.2	22.6
SE	39.0	37.9	36.9
SI	26.0	28.0	28.5
SK	16.3	19.0	21.7
UK	33.7	35.0	35.6

Fig. 25: Share of non-standard forms of work in total employment in percent

The results are based on a composite indicator that excludes multiple counting. Non-standard forms of work are defined as: agency workers; employees with fixed-term contracts (excluding agency workers); full-time one-person enterprises; part-time workers in permanent employment (excluding agency workers) and part-time one-person enterprises; 'marginal' part-time employees in permanent employment (excluding agency workers) or 'marginal' part-time one-person enterprises. [52]

5.3 Goals, challenges and key principles

People using non-standard forms of employment can then have only minimal or no security and fundamental rights. They do not reach the minimum income or social and health insurance. They can lose their jobs easily and without reason, they may be under pressure from the entities they work with (e.g. online platforms) or they may be restricted in their other rights. The aim is therefore to ensure higher and better protection for workers using other forms of employment through the use of collective agreements.

The key principles depend to a large extent on the specific work and possible form of employment, but we can include the following: [53]

- The right to a minimum wage, social and health insurance contributions.
- The right to compensation in the event of order cancellation.
- The right to paid leave.
- Entitlement to a minimum number of allocated working hours or orders.
- Set fair conditions that allow a shift between working for the platform and regular employment.
- Provision of a contribution to operating costs - e.g. maintenance of a bicycle, motorcycle, car for food delivery.
- Impossibility of unreasonable removal from the platform and the need to give one's notice.
- Qualification and training requirements.
- …

5.4 Best practice examples

In connection with the issue of protection of non-standard forms of employment within the framework of collective agreements, let us mention one of the best-known examples, which is the collective agreement between the Danish company Hilfr and the Danish trade union 3F. Hilfr is an online platform providing cleaning services in private homes. It had around 1,700 customers throughout Denmark and employed around 450 people in 2018. The 3F trade union is the largest trade union in Denmark, with approximately 278,000 Danish members and more than 48,000 members from other countries. The collective agreement concluded between these two entities represents one of the first collective agreements within the so-called gig economy, which entered into force during 2018. (Note: Gig economics is a variety of fixed-term work that consists of companies hiring independent contractors and external staff instead of full-time employees.) [21,49,54,55,56]

Fig. 26: Hilfr and the 3F trade union [58,59]

The collective agreement provides employees with significant guarantees. Self-employed workers (freelancers) are automatically classified as employees after working 100 hours. (That is, if they choose to remain self-employed, they are not covered by this agreement.) These employees are entitled to higher wages, around EUR 19 compared to EUR 15.5 (values valid in 2018). Furthermore, they are guaranteed some financial compensation for work cancelled in a short period of time and the collective agreement also includes provisions on health care and pension contributions. Furthermore, if Hilfr wants to remove employees from its platform, it must give them their notice and a reasonable reason. [21,49,54,55,56]

Initially, there were some initial concerns that the costs of securing an agreement could lead to uncompetitiveness in a market that is still relatively limited. However, following the announcement of the agreement, Hilfr saw a 50% increase in demand for cleaning services, a fact attributed to the company's willingness to engage in collective bargaining. Hilfr's cooperation with the social partners becomes a competitive advantage and distinguishes it from the competition. An important advantage is that, thanks to the collective agreement, this on-demand service is more reliable for both employees and application users. For example, a provision that compensates employees for tasks that are cancelled in a short period of time means that employees can rely more on the tasks they obtain through the application. Stable work, a reliable income and the protection provided by employment status reduce job changing, which is likely to lead to better service quality. [21,49,54,55,56]

However, the collective agreement between Hilfr and the 3F trade union is not the only one. There are other proven examples of the protection of non-standard forms of employment, or of workers who use them, in the framework of collective agreements. The following table lists some of these examples for digital online platforms.

Tab. 5: Best practice examples - Agreement on the protection of workers in new forms of employment

Company/ Platform/ Sector	Solution within digital online platforms
Logistics sector (Italy)	A collective agreement was concluded in the Italian logistics sector in December 2017, which now includes contract workers for food delivery in their contractual qualifications for the first time. The agreement was signed by selected trade unions and employers' organizations. The agreement covers working time, the notice requirement and compensation for changes to the work schedule and compensation in the event of illness. Following this collective agreement, the Cgil trade union proposed to start negotiations on algorithms for food delivery platforms that manage task assignments and schedules. [60]
Bzzt platform (Sweden)	The agreement between Bzzt, which offers Uber-like services with electric mopeds, and the Swedish Transport Workers' Association allows Bzzt riders to be covered by a taxi agreement that gives workers access to the same standards as traditional taxi drivers. [60]
Sgnam, MyMenu (Italy)	A 'Charter of the Fundamental Rights of Digital Workers in the Urban Environment' was signed in Bologna, Italy, during 2018 between the mayor, selected unions and two food delivery platforms, Sgnam and MyMenu, which together employ about a third of the food delivery riders in Bologna. The Charter provides for a fixed hourly rate equal to or in excess of the minimum wage in the sector concerned, compensation for overtime, public holidays, compensation for bad weather and insurance against accidents at work and illness. It also aims to cover accidents that may occur on the way to and from work, compensation for bicycle maintenance and guarantees freedom of association and the right to strike. [60]
Hermes (Great Britain)	The British courier company Hermes negotiated a new agreement with the GMB trade union in February 2019, which guarantees drivers a minimum wage and holiday pay under a trade union recognition agreement. [60]
Temper (The Netherlands)	The Dutch trade union and the Temper platform for labour supply and demand in hotels, restaurants and cafés signed a 'Cooperation Pact' in 2018 as a one-year pilot program to provide Temper (legally self-employed) workers with training, pensions and insurance. The collaboration between Temper and the unions was later expanded after positive experience in the first months, adding other elements such as the removal of the software fee that Temper employees had to pay and improved training offers. [60]
Uber (Great Britain)	Uber entered into a partnership with the British association IPSE (Independent Professionals and the Self-Employed) in 2017 to provide discounted sickness and accident insurance for Uber drivers. Drivers can use it for GBP 2 (approximately EUR 2.20) per week, instead of the 'market rate' of approximately GBP 8 (EUR 8.80) per week and are insured against sickness and accidents up to GBP 2,000 (EUR 2,200 EUR) if they cannot drive for two or more weeks. [60]

Voocali (Denmark)	Voocali is a technology start-up working with freelancers, which built an interpreting platform that handles both remote video interpreting and on-site interpreting. This start-up signed an agreement for employed workers and a special agreement covering the work performed through the platform by non-employees. The parties agreed that self-employed workers are not paid below the lower quartile for wages, including all staff costs in salary statistics. The participants also discussed how to allocate resources for the further training of freelancers through the Skills Fund for Freelancers. They also worked on reaching an agreement on pension savings. [60]
Airstrike (Australia)	The agreement between the unions and Airtasker specifies several basic procedures and protection for workers, including measures on recommended wage rates, accident insurance, safety and dispute resolution. NSW, Airtasker and the Fair Work Commission agreed, among other things, to develop an appropriate dispute resolution system, overseen by the commission that would also act as the final arbitrator. This is an important step in recognizing the dependent nature of staff on the platform and the importance of an independent and transparent arbitration system in the event of disputes. [60]
Chabber, Instajobs, Gigstr (Nordic countries)	Some platforms in the Nordic countries have registered as temporary employment agencies and are therefore subject to collective rules on temporary agency work (Jesnes et al, 2019). It can be another way to improve working conditions for platform staff and their negotiation opportunities. [60]

The following matrix (Figure 27) shows how traditional unions approach the engagement of workers using non-standard forms of work on the basis of existing examples. What strategies, approaches and tools they use.

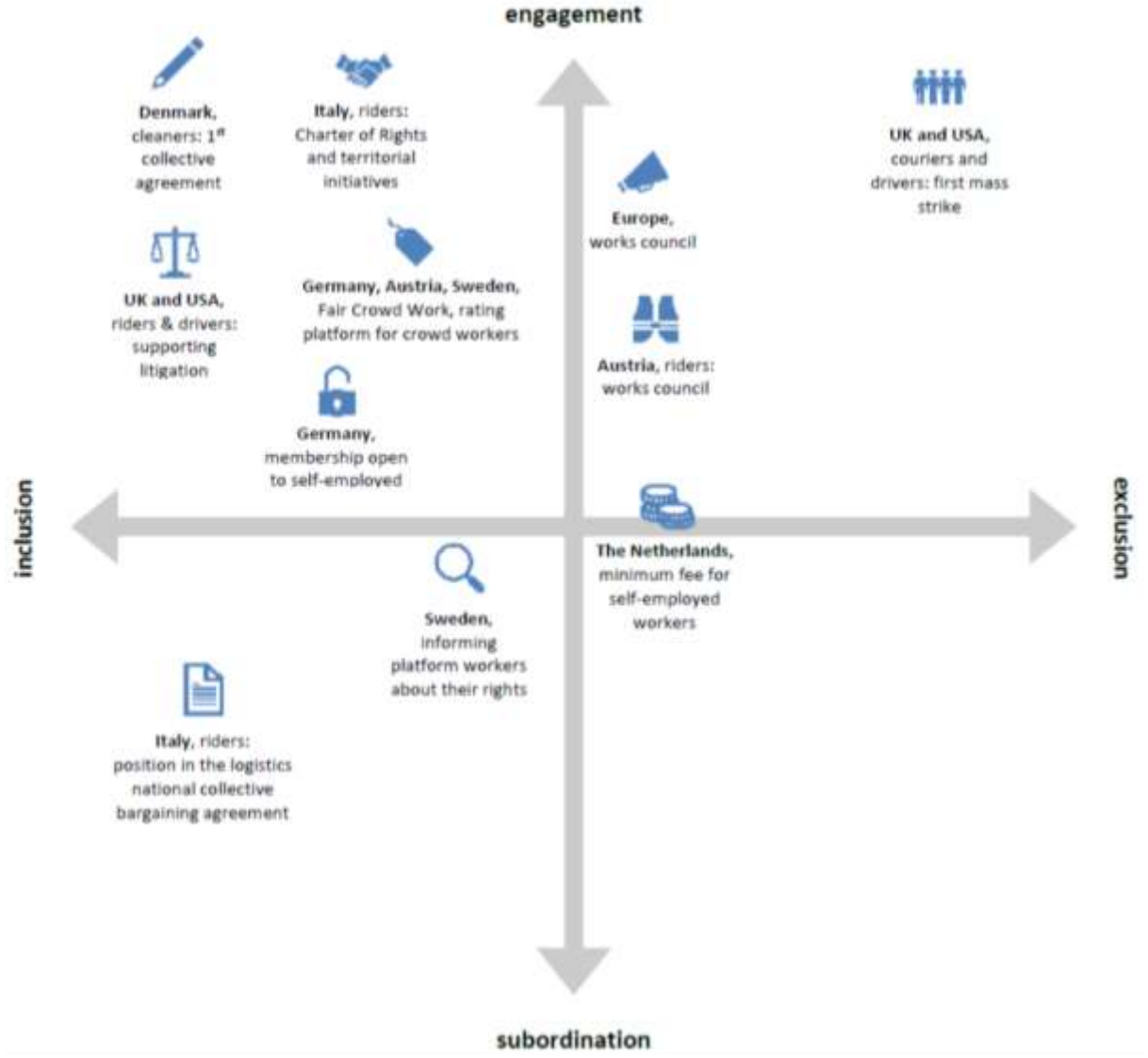


Fig. 27: How traditional unions approach the engagement of workers using non-standard forms of work. What strategies, approaches and tools they use. [61]

6 Risk of incorrectly set agreements

The United Nations World Commission on Environment and Development defined in its report 'Our Common Future' in 1987 sustainable development as development that meets the needs of present generations without compromising the ability of future generations to meet their own needs. Sustainable development is primarily based on 3 pillars, which are economic, environmental and social sustainability. If we want development to be truly sustainable, all 3 pillars must be perfectly balanced. It is not a definition valid only in general, worldwide, but it is also valid separately for individual states, their economies, companies and what is happening in them.

In this regard, it should be noted that collective agreements must also be sufficiently balanced in all three respects. Given that the study dealt with the fundamental problems of employee protection until this chapter, let us pause, at least briefly, on the other side of the problem, and that is, excessive protection of employees through collective agreements in some respects. This area should not be left out of these agreements either.

6.1 Risk of losing competitiveness

First of all, we must not forget the fact that just as it is not possible to prioritize, for example, the economic side at the expense of working conditions of employees, it is not possible to prioritize, for example, excessive employee protection at the expense of digitalisation, automation, robotics or the development of the company in general. There would be a major risk of losing competitiveness. Then, the quote by Neruda might apply: 'Who stands for awhile, stands aside in a while.' Ultimately, this could mean that a company in a highly competitive and global market environment will fail and eventually go bankrupt or, in the case of large companies, move its production elsewhere, to countries with more favourable conditions.

6.2 Risk of negative impacts on the economy and the labour market

In connection with collective agreements, it must be borne in mind that excessive protection of employees in connection with redundancies or the overall reduction of their numbers is not appropriate. Poorly set collective agreements and excessive employment protection can reduce mobility and job changing across sectors of the economy or between successful and unsuccessful companies within a sector. This may have negative effects on the economy, its individual sectors and the labour market as a whole. [27,50]

The analyses of developments in different countries show that as countries' technological level of development grows, the workforce is gradually shifting from the primary sector (e.g. agriculture and raw material extraction) to the secondary sector with the manufacturing industry and then to the tertiary sector (services sector). Naturally, the whole process must be accompanied by an improving economic situation of the population and their willingness to spend on services (e.g. for better health care, financial services, education, etc.), which leads to the growth of this sector. [62]

In this context, we can see, for example, how the situation on the US labour market changed from 1850 to 2015 (Figure 28). There is a clear situation where workers in agriculture, manufacturing or mining industries are declining and employment in the services sectors is growing. [63]

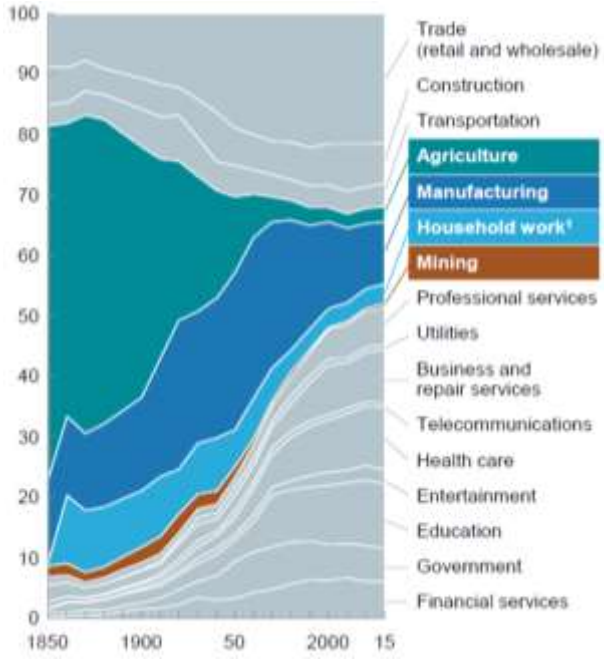


Fig. 28: Employment change in individual sectors of the US economy [63]

An example can be, according to the OECD analysis, the situation in the Venice region, which is located in the north of Italy and is one of the largest (approximately 5 million inhabitants) and the most economically dynamic regions of Italy. As elsewhere, redundancies in industry began gradually in the region in 2008 as a result of the economic crisis and lasted until 2014 (Figure 29). From this year on, employment began to grow again and it essentially returned to the situation before the crisis in 2017. However, the labour market has undergone significant changes due to digitalisation. In particular, the already mentioned gradual transfer of people to the services sector took place.

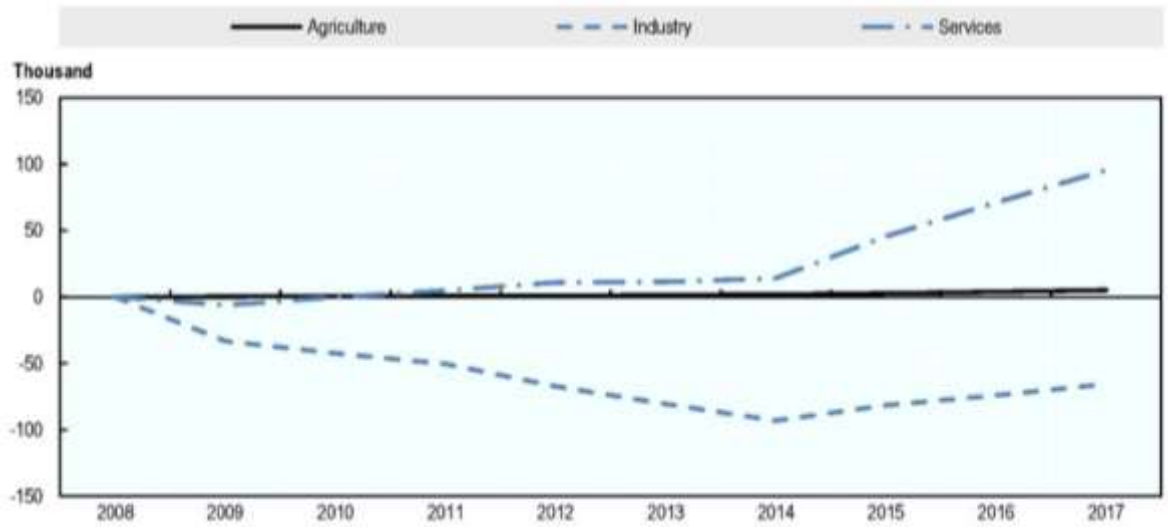


Fig. 29: Employment development in the industrial and services sector in the Venice region [64]

Thanks to technological changes, completely new jobs and professions will be created directly in the manufacturing industry and in other sectors for which it will be necessary to secure a workforce. An example of such a situation from the past can be the development of computers. McKinsey & Company stated in its analysis that although computers destroyed more than 3.5 million jobs in the United States, more than 19 million jobs were created, especially in other industries and sectors of the economy. [63]

It is expected that a similar situation with computers will occur in modern technology. Examples are virtual and augmented reality. According to a 2019 report by PwC, up to around 23 million jobs could be created in connection with these technologies by 2030, almost 23 times more than at present. Growth is also expected in Europe. For example, it is assumed that about 400,000 new jobs will be created in Germany and Great Britain by 2030 (Figure 30), which is a significant increase compared to the present - about 10-15,000 jobs in each country. The share of jobs generated by the development of virtual and augmented reality in relation to the total number could be about 0.75-1.25% in 2030 (Figure 31).

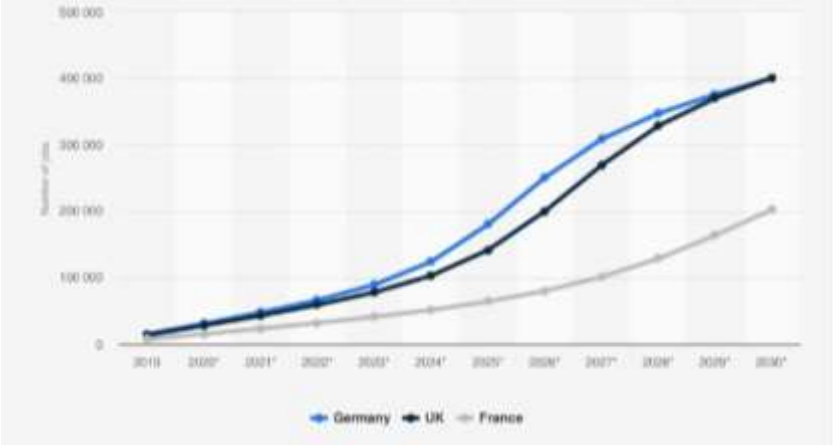


Fig. 30: Development of the number of jobs generated by development of virtual and augmented reality in EU countries [65,66]

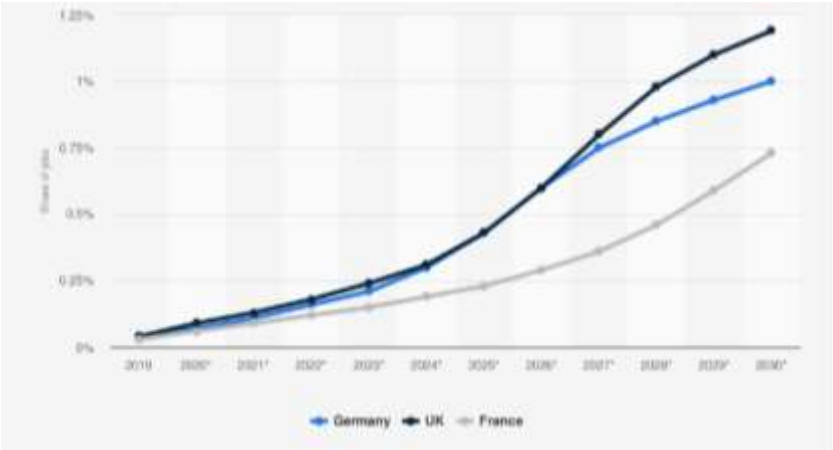
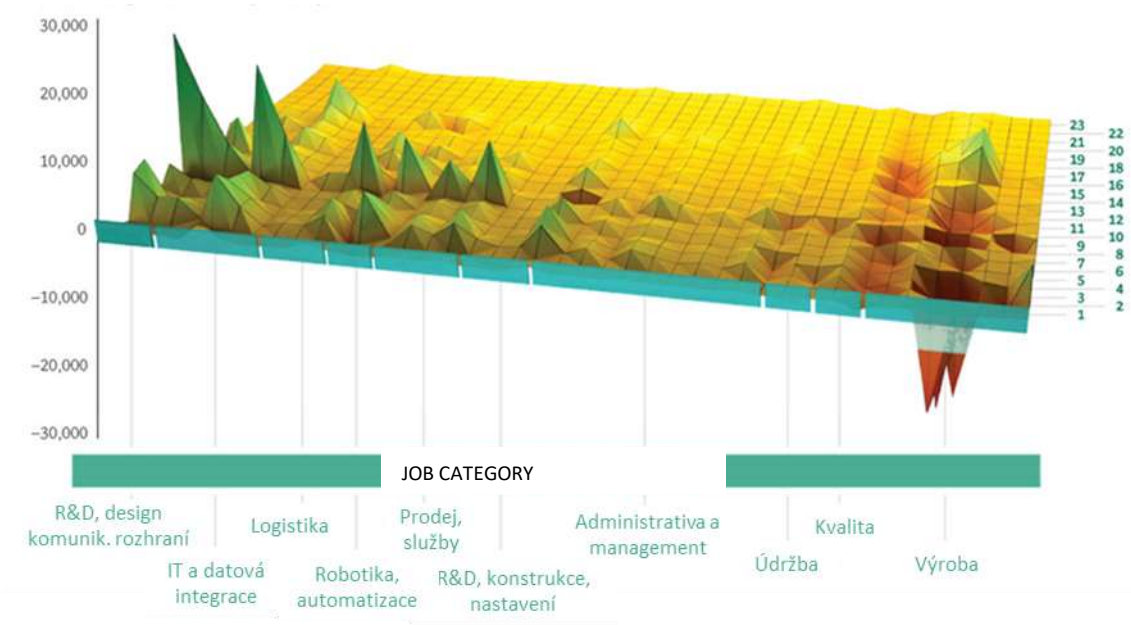


Fig. 31: Share of jobs generated by the development of virtual and augmented reality in relation to the total number of jobs in EU countries [65,66]

A more detailed comprehensive analysis of changes in the labour market in general and in employment in connection with digitalisation, automation and robotics was performed, for example, by Boston Consulting Group in 2015. The research analysed the possible impacts of the introduction of the Industry 4.0 concept focused on the potential development of the number of jobs in the manufacturing industry. There are, of course, various scenarios, the optimistic ones provide for the dismissal of employees as a result of the implementation of Industry 4.0 and for an increase in new jobs associated with the recruitment of experts and workers in other areas. [67,68]

Taking a detailed look at the development of employment in the German manufacturing industry until 2025 across individual sectors and across professions, BCG expects a significant change in the distribution of employees across individual job categories [68]. The situation can be seen in the following 3D diagram (Figure 32).



R&D, design, communication interface
IT and data integration
Logistics
Robotics, automation
Trade, services
R&D, construction, setting
Administration and management
Maintenance
Quality
Production

Fig. 32: Estimate of the development of the absolute number of jobs in Germany until 2025 by type of industry and job category. Source: Adapted according to [67,68]

Right axis: 1-Aerospace and defence; 2-Clothing, footwear; 3-Automotive; 4-Electrical engineering industry; 5-Semiconductors; 6-Metalworking; 7-Wood processing industry; 8-Manufacture of machinery; 9-Medical products; 10-Plastics and rubber; 11-Printing and publishing; 12-Other discreet industry.

Poorly set collective agreements could therefore have a significant negative effect on the changes mentioned here, which will take place in the future.

Conclusion

Digitalisation, automation, robotics, the general introduction and use of modern technologies bring many benefits to companies and workers. It is about higher competitiveness, higher productivity, better working conditions, new ways of work organization or better quality of services and products, etc. However, potential challenges, risks and problems that can have a significant negative impact directly on employees, one of the most important corporate resources, are often forgotten. Working conditions and occupational health and safety may be endangered, the quality of work and thus private life deteriorate or, in the worst cases, employment may be endangered.

In this context, there is a need for a joint commitment on the part of employers, employees and their representatives both to make the most of opportunities and to best meet the challenges that modern technology brings to the world of work. [1] One way to achieve this is to adapt the content of collective agreements and other related documents accordingly.

It is the appropriate content setting that is addressed in the study presented here, which aimed to identify key areas that are important to address in more detail and to recommend possible measures, principles and rules that will help address potential problems and risks for employees. It is essential to focus on setting the following areas:

1. Preparation for the actual introduction of modern technologies - setting the participation of employees in bodies, setting the process of introducing technologies (analysis of advantages and limitations, impacts on employees, etc.) and its time frame.
2. Protection of working conditions
    a. Education (and employment) - setting the system of education, training and retraining and its functioning (time, compensation, etc.), the system of creating new and re-designing existing jobs and the transition of employees across jobs, etc.
    b. Quality of working conditions - ensuring occupational safety and health protection of employees and in this respect the evaluation of existing and new technologies, setting rules for the use of artificial intelligence, etc.
    c. Work organization - setting the rules of contact outside working hours, ensuring the right to disconnect, setting the rules of working from home, etc.
    d. Remuneration of employees - setting flexible remuneration systems, e.g. with salary bands, using self-assessment of employees, etc.
    e. Cyber security and excessive control of employees - familiarizing employees with their rights and obligations, definition of collected data on employees, etc.
    f. Disadvantaged groups of workers - setting principles leading to equal opportunities, e.g. with regard to training, enabling participation in company bodies, etc.
    g. Threats to social contact - defining behaviour in virtual space, ensuring regular social contact as protection against isolation, setting rules for the use of artificial intelligence and other systems in relation to customers, etc.

3. Protection of workers in new forms of employment - ensuring the right to minimum wage, social and health insurance contributions, contributions to operating costs, ensuring the impossibility of unjustified removal from the platform, etc.

Another goal of the study was to present best practice examples. Setting the content of collective agreements and related documents might seem difficult at first glance, but the best practice examples in the study show that it is possible to benefit from new technologies without compromising labour rights or working conditions. Undoubtedly, there are ways to solve such complex problems.

However, collective agreements should not focus only on the social side. The content of collective agreements should always be sustainable development, where all three of its pillars, which are economic, environmental and social sustainability, must be balanced. Not only in relation to the company itself, but also in relation to the economy and the labour market in the long run. Indeed, it is necessary to protect both workers and, for example, to make full use of the potential of modern technologies, to positively promote labour market mobility and to consider the structural transformations of the labour market and the economy [50]. Discussion, an open and forthcoming approach by all parties involved, as well as an effort to find a reasonable compromise are necessary in order to achieve such balanced collective agreements.

Bibliography

1. BUSINESSEUROPE, SMEUNITED, CEEP a ETUC. *EUROPEAN SOCIAL PARTNERS FRAMEWORK AGREEMENT ON DIGITALISATION* [online]. In: . Červen 2020 [cit. 2020-11-09]. Dostupné z: https://www.etuc.org/system/files/document/file2020-06/Final%2022%2006%2020_Agreement%20on%20Digitalisation%202020.pdf
2. ILO (2017). *Trends in collective bargaining coverage: Stability, erosion or decline?* ILO Issue Brief, 2017, No. 1. Dostupné z https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_409422.pdf
3. Blanchflower, D. G. a Freeman, R. B. (1992). *Unionism in the United States and Other Advanced OECD Countries*. Industrial Relations, 1992, Vol. 31, No. 1.
4. Boeri, T., Brugiavini, A., Calmfors, L. (2001). *The Role of Unions in the Twenty-first Century: A Report for the Fondazione Rodolfo Debenedetti*. New York: Oxford University Press.
5. Kroupa, A., Hála, J., Vašková, R., Mansfeldová, Z., Šimoník, P. (2004). *Odbory, zaměstnavatelé, sociální partneři – odborová organizovanost v ČR a hlavní faktory jejího vývoje.* VÚPSV, 2004. Dostupné z http://praha.vupsv.cz/Fulltext/MS-odbor.pdf
6. Vandaele, K. (2006). *A Report from the Homeland of the Ghent System: The Relationship between Unemployment and Union Membership in Belgium.* Transfer: European Review of Labour and Research, Vol. 12, No. 4.
7. Ledwith, S. (2012). *Gender politics in trade unions. The representation of women between exclusion and inclusion*. Transfer: European Review of Labour and Research, Vol. 18, No. 2.
8. Duspivová, *K., Husaříková, L., Nesrstová, M. (2019) Role sociálního dialogu při snižování nerovností na českém trhu práce.* Trexima, Dostupné z https://ipodpora.odbory.info/soubory/uploads/CASTII_01_ROLE_SD_FINAL.pdf
9. Trexima (2015). *Prognóza vlivu kolektivního vyjednávání a zvyšování minimální mzdy na zaměstnanost.* Trexima, 2015, Dostupné z https://ipodpora.odbory.info/soubory/dms/ukony/14405/6/Min_mzda_TREXIMA_FINAL.pdf
10. OECD.stat. (2020). *Collective bargaining coverage.* Dostupné z https://stats.oecd.org/Index.aspx?DataSetCode=CBC#
11. SCHOLZ, Pavel, Petr WEISSER a Zdeněk KADLEC. *Studie možných změn pracovní síly v době digitalizace a robotizace*. ČVUT v Praze, Fakulta strojní, Ústav řízení a ekonomiky podniku. Praha, 2020.
12. WEF. *The Future of Jobs Report 2018*. 2018. Dostupné také z: http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf
13. OECD. *OECD Employment Outlook 2019*. 2019. Dostupné také z: https://www.oecd-ilibrary.org/employment/the-decline-of-the-manufacturing-sector_cc51a592-en
14. PWC. *Will robots really steal our jobs?* 2018. Dostupné také z: https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/impact_of_automation_on_jobs.pdf
15. BCG. *Advanced Robotics in the Factory of the Future*. 2019. Dostupné také z: https://www.bcg.com/de-de/publications/2019/advanced-robotics-factory-future
16. STATISTA. *Labor Shortage: Workers with a higher education*. 2019. Dostupné také z: https://www.statista.com/study/69261/labor-shortage/
17. OECD. *OECD Skills for Jobs Database*. 2015. Dostupné také z: https://www.oecd.org/els/emp/OECD%20Skills%20for%20Jobs.pdf
18. UNIT THE UNION. *DRAFT NEW TECHNOLOGY AGREEMENT* [online]. In: . Listopad 2017 [cit. 2020-11-09]. Dostupné z: https://unitetheunion.org/media/1237/new-tech-agreement.docx

19. PEÑA-CASAS, Ramón, Dalila GHAILANI a Stéphanie COSTER. *THE IMPACT OF DIGITALISATION ON JOB QUALITY IN EUROPEAN PUBLIC SERVICES THE CASE OF HOMECARE AND EMPLOYMENT SERVICE WORKERS* [online]. In: . Červen 2018 [cit. 2020-11-09]. Dostupné z: https://www.epsu.org/sites/default/files/article/files/FINAL%20REPORT%20EPSU%20DIGITALISATION%20-%20OSE%20June%202018.pdf
20. MONSEN, Par Nina. Norwegian Municipal Union Signs Tripartite Agreement on Worker Involvement and Social Dialogue in Public Sector Digitalisation. Dostupné z: https://www.world-psi.org/en/norwegian-municipal-union-signs-tripartite-agreement-worker-involvement-and-social-dialogue-public
21. ILO. *SOCIAL DIALOGUE AND THE FUTURE OF WORK* [online]. In: . 2020 [cit. 2020-11-09]. Dostupné z: https://www.theglobaldeal.com/resources/Thematic-Brief-Social-Dialogue-and-the-FoW.pdf
22. TURLAN, Frédéric. *France: First company-level agreement on digital transformation signed at Orange* [online]. In: . 2017 [cit. 2020-11-09]. Dostupné z: https://www.eurofound.europa.eu/publications/article/2017/france-first-company-level-agreement-on-digital-transformation-signed-at-orange
23. HAIPETER, Thomas. *Digitalisation, unions and participation: the German case of 'industry 4.0'* [online]. In: . 11. června 2020 [cit. 2020-11-09]. Dostupné z: https://onlinelibrary.wiley.com/doi/full/10.1111/irj.12291
24. *Das Projekt Arbeit2020+ in NRW* [online]. In: . 11. června 2020 [cit. 2020-11-09]. Dostupné z: https://www.arbeit2020.de/
25. ROBERTSON I, Cooper C: *Well-Being: Productivity and Happiness at Work*. London: Palgrave Macmillan; 2011.
26. COOPER CL, Lundberg U: *The Science of Occupational Health: Stress, Psychobiology, and the New World of Work*. Oxford: Wiley-Blackwell; 2011.
27. RITZEN, Jo a Klaus F. ZIMMERMANN. *A vibrant European labor market with full employment* [online]. 2014. [cit. 2020-11-09]. Dostupné z: https://link.springer.com/article/10.1186/2193-9012-3-10
28. HEMP, Paul. *Presenteeism: At Work—But Out of It* [online]. In: . Říjen 2004 [cit. 2020-11-09]. Dostupné z: https://hbr.org/2004/10/presenteeism-at-work-but-out-of-it
29. *Die Betriebslandkarte Arbeit und Industrie 4.0 - Ein Anwendungsleitfaden* [online]. In: .[cit. 2020-11-09]. Dostupné z: https://www.arbeit2020.de/fileadmin/Arbeit2020/4.1_Broschueren/Betriebslandkarte_Anwendungsleitfaden.pdf
30. MEIER, Christoph. *Industrie 4.0 und Aus-&Weiterbildung: Arbeitsgruppe, Leitfaden, Landkarte* [online]. In: . Duben 2019 [cit. 2020-11-09]. Dostupné z: https://www.scil.ch/2019/04/07/industrie-4-0-und-aus-weiterbildung-arbeitsgruppe-leitfaden-landkarte/
31. ROCHA, Fernando a Luis de la FUENTE. *The Social Dialogue in the face of digitalisation in Spain An emerging and fragmented landscape* [online]. In: . Prosinec 2018 [cit. 2020-11-09]. Dostupné z: https://1mayo.ccoo.es/fd26563df6fb4f5ad08fd2cc8744b24b000001.pdf
32. ETUC. *DIGITALISATION AND WORKERS PARTICIPATION: WHAT TRADE UNIONS, COMPANY LEVEL WORKERS AND ONLINE PLATFORM WORKERS IN EUROPE THINK* [online]. In: . Říjen 2018 [cit. 2020-11-09]. Dostupné z: https://www.etuc.org/sites/default/files/publication/file/2018-09/Voss%20Report%20EN2.pdf
33. TEISSIER, Christophe a Frédéric NAEDENOEN. *Digitalisation and restructuring: which social dialogue?* [online]. In: . 2020 [cit. 2020-11-09]. Dostupné z: http://diresoc.eu/wp-content/uploads/2020/10/Diresoc-WP4-Synthesis-Report.pdf

34. EU-OSHA - European Agency for Safety and Health at Work (2015) 'A review on the future of work: online labour exchanges, or "crowdsourcing": Implications for occupational safety and health'. Available at: https://osha.europa.eu/en/tools-and-publications/publications/future-workcrowdsourcing/
35. MASCHKE, Manuela. *Digitalisation: challenges for company codetermination* [online]. In: . 2016 [cit. 2020-11-09]. Dostupné z: https://www.etui.org/sites/default/files/Digitalization%20Co-determination%20Maschke%20Policy%20Brief%20PB%202016.07.pdf
36. RUUKEL, Mikael. *"IT Safety Inspections" and Digital Work Environment* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.epsu.org/sites/default/files/article/files/Presentation-Ruukel.pdf
37. CASAS, R. Peña. *Impact of digitalisation on job quality in public services* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.epsu.org/sites/default/files/article/files/Presentation-Pena-Casas.pdf
38. Wajcman, Judy. Pressed for Time: The Acceleration of Life in Digital Capitalism. University of Chicago Press, 2016. 227 stran. ISBN-13 : 978-0226380841.
39. Messenger, Jon. Working time and the future of work. Dostupné z: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_649907.pdf
40. LUDICONE, F. Italy: New rules to protect self-employed workers and regulate ICT-based mobile work. EurWork, Eurofound, Dublin, 2017. Dostupné z: https://www.eurofound.europa.eu/de/observatories/eurwork/articles/italy-new-rules-to-protect-selfemployed-workers-and-regulate-ict-based-mobile-work
41. Eurofound and the International Labour Office (ILO). Working anytime, anywhere: The effects on the world of work. Publications Office of the European Union, Luxembourg, and the International Labour Office, Geneva, 2017 ISBN 9789221304722.
42. SCHAHINIAN, David. *Bosch and IG Metall conclude innovative collective agreement* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.hannovermesse.de/en/news/news-articles/bosch-and-ig-metall-conclude-innovative-collective-agreement
43. Heise.de. *Innovationstarifvertrag fuer digitale Elite Bosch einigt sich mit IG-Metal.* In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.heise.de/newsticker/meldung/Innovationstarifvertrag-fuer-digitale-Elite-Bosch-einigt-sich-mit-IG-Metall-4205629.html
44. ROCHA, Fernando a Frédéric NAEDENOEN. *Work Package 3: Case Studies* [online]. In: . Červen 2020 [cit. 2020-11-09]. Dostupné z: http://diresoc.eu/wp-content/uploads/2020/07/WP3_Synthesis-report.pdf
45. CARUSO, Loris. *Digital innovation and the fourth industrial revolution: epochal social changes?* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://link.springer.com/article/10.1007%2Fs00146-017-0736-1
46. *How Trade Unions Can Use Collective Bargaining to Uphold and Improve Working Conditions in the Context of the Digital Transformation of Public Services* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.fes.de/index.php?eID=dumpFile&t=f&f=35461&token=b0bf5adfc76ca97b3beefc3be7834f9c7899f6e3
47. HOLBOURNE, Zita. *Adverse Disproportionate Impacts of Digitalisation on black & minority ethnic workers* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.epsu.org/sites/default/files/article/files/Impact%20of%20digitalisation%20on%20BME%20workers%20EPSU%20June%2018%20-%20Zita%20Holbourne.pdf

48. BEHRENDT, Christina a Quynh Anh NGUYEN. *Innovative approaches for ensuring universal social protection for the future of work* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_629864.pdf
49. HALE, Julian. *In Denmark, a historic collective agreement is turning the "bogus self-employed" into "workers with rights"* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.equaltimes.org/in-denmark-a-historic-collective?lang=en#.X53J6IhKibi
50. BEHRENDT, Christina a Quynh Anh NGUYEN, Uma RANI. *Social protection systems and the future of work: Ensuring social security for digital platform workers* [online]. In: . 2019 [cit. 2020-11-09]. Dostupné z: https://onlinelibrary.wiley.com/doi/full/10.1111/issr.12212
51. *Sdílení zaměstnanců nebo pracovního místa? To jsou nové formy zaměstnávání na pracovním trhu* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.trexima.cz/aktualita/sdileni-zamestnancu-nebo-pracovniho-mista-to-jsou-nove-formy-zamestnavani-na-pracovnim-trhu
52. WALWEI, Ulrich. *Digital and structural labour market problems: The case of Germany* [online]. In: . 2016 [cit. 2020-11-09]. Dostupné z: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_522355.pdf
53. OECD. *The Future of Social Protection - What Works for Non-standard Workers?* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://read.oecd-ilibrary.org/social-issues-migration-health/the-future-of-social-protection_9789264306943-en#page36
54. Collective Agreement between Hilfr ApS. CBR.No.: 37297267 and 3F Private Service, Hotel and Restaurant. https://lontjek.dk/arbejdsretten/database-over-kollektive-overenskomster/collective-agreement-between-hilfr-aps-and-3f-private-service-hotel-and-restaurant-2018---2019
55. FRIIS, Søren Elkrog. *Hilfr-overenskomst kritiseres for at underminere den danske model* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.altinget.dk/artikel/hilfr-overenskomst-kritiseres-for-at-underminere-den-danske-model
56. LANGEROVÁ, Jana. *Co je to gig ekonomika a jak to s ní u nás vypadá?* [online]. In: . 2018 [cit. 2020-11-09]. Dostupné z: https://www.podnikatel.cz/clanky/co-je-to-gig-ekonomika-a-jak-to-s-ni-u-nas-vypada/
57. Eurofound: Making the Platform Economy Work Well for Workers. https://www.youtube.com/watch?v=YHebHO1uCvo&t=960s
58. *3F - United Federation of Workers in Denmark* [online]. In: . [cit. 2020-11-09]. Dostupné z: https://www.3f.dk/
59. *Hilfr* [online]. In: . [cit. 2020-11-09]. Dostupné z: https://hilfr.dk/en
60. MEXI, Maria. *Social Dialogue and the Governance of the Digital Platform Economy: Understanding Challenges, Shaping Opportunities* [online]. In: . 2019 [cit. 2020-11-09]. Dostupné z: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---dialogue/documents/meetingdocument/wcms_723431.pdf
61. ALOISI, Antonio. *Negotiating the digital transformation of work* [online]. In: . 2019 [cit. 2020-11-09]. Dostupné z: https://cadmus.eui.eu/bitstream/handle/1814/63264/MWP_Aloisi_2019_03.pdf?sequence=1&isAllowed=y
62. MANAGEMENT MANIA. *Sektor služeb (terciární sektor)*. Dostupné také z: https://managementmania.com/cs/sektor-sluzeb-terciarni-sektor
63. MCKINSEY & COMPANY. *Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages*. 2017. Dostupné také z: https://www.mckinsey.com/~/media/McKinsey/Industries/Public%20and%20Social%20Sector/Our

%20Insights/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.pdf
64. OECD. *Job Creation and Local Economic Development 2018*. 2018. Dostupné také z: https://read.oecd-ilibrary.org/employment/job-creation-and-local-economic-development-2018_9789264305342-en#page84
65. PwC. (2019). *Number of jobs enhanced by virtual reality (VR) and augmented reality (AR) worldwide from 2019 to 2030 (in millions)*. *Statista*. Statista Inc.. Accessed: July 23, 2020. https://www.statista.com/statistics/1121601/number-of-jobs-enhanced-globally-by-vr-and-ar/
66. PwC. (2019). *Number of jobs enhanced by virtual reality (VR) and augmented reality (AR) in Europe's leading economies from 2019 to 2030*. *Statista*. Statista Inc.. Accessed: July 23, 2020. https://www.statista.com/statistics/1121646/number-of-jobs-enhanced-by-vr-and-ar-in-europe-s-leading-economies/
67. BCG. *Industry 4.0: The Future of Productivity and Growth in Manufacturing Industries*. 2015. Dostupné také z: https://www.bcg.com/publications/2015/engineered_products_project_business_industry_4_future_productivity_growth_manufacturing_industries
68. BCG. *Man and Machine in Industry 4.0*. 2015. Dostupné také z: https://www.bcg.com/publications/2015/technology-business-transformation-engineered-products-infrastructure-man-machine-industry-4
69. *Zákoník práce: úplné znění zákona č. 262/2006 Sb.* Praha: Armex, 2007. Edice kapesních zákonů. ISBN 978-80-86795-44-7.
70. TRÖSTER, Petr. *Zákon o kolektivním vyjednávání*: komentář. Praha: Wolters Kluwer, 2014. Komentáře (Wolters Kluwer ČR). ISBN 978-80-7478-644-0.