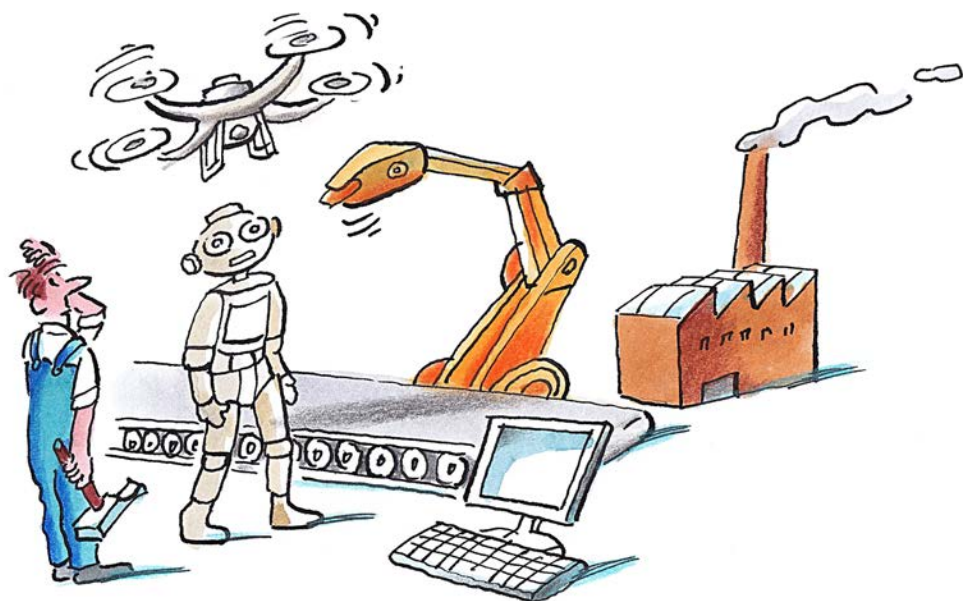


Digital world of work – technological developments and changes in the workplace





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Preface

Digital technologies have been moving into our everyday life for several years. They make our lives easier in many respects, enable new things and accelerate many others.

We are experiencing and already feeling a digital economy with new business models, the networked use of robot technology, the Internet of Things and what various stakeholders call “artificial intelligence” – a disputed term as it assigns a human attribute to a technology.

Digitalisation has also become part of everyday life – and this concerns us at EZA in particular – in countless companies with differing intensity and speed. That changes work organisation, necessitates new ways and approaches in education, further and continuing training, results in all manner of labour relations, and influences the social security systems and labour markets in Europe.

This means multiple challenges for trade unions and other worker organisations. For EZA, this was reason enough to co-ordinate six projects in the 2017/2018 education year under the heading “Digital world of work – technological developments and changes at the workplace” which addressed different aspects of this issue. My special thanks go at this point to Jelena Soms, who headed the project co-ordination and drew up this report.

The European Commission’s Directorate-General for Employment, Social Affairs and Inclusion supported our activities with content and funding. The use of digital technology in the world of work – and the associated radical changes – has begun, is continuing and an end is not foreseeable. The changes being observed are profound and require political action in Europe. More than anything, though, they need a legal framework.

However, trade unions and other workers' organisations must also scrutinise their own action so far, review their structures and consider how in a more digitalised world of work they can represent and protect workers' interests in accordance with their mission and self-conception.

This publication shows very clearly how diversely and extensively digital technologies will shape the future world of work, and makes suggestions on where the critical points are for tackling the challenges in a rapidly changing world of work with a sustainable social dialogue.

I hope you enjoy your reading!

Sigrid Schraml
EZA Secretary-General

1 Introduction

Digitisation, automation and the sharing economy will have a huge impact on the labour market in future. They will change all sectors, at all levels.

The new technology will become established in our everyday lives. It poses both opportunities and threats.

There are two streams of thought:

- Those who fear that the wave of digitisation will cause the loss of jobs and welfare
- Those who are of the opinion that it will create jobs

Position of the European Commission

- The digital economy has the potential to create growth and employment by providing opportunities for investment and innovation, which leads to expanding markets and more choice in goods and services at lower prices. Better information flows can improve everything, from health, food safety and food security and resource efficiency to energy, intelligent transport systems and smart cities. Digital technologies have already made a major contribution to economic growth (Commission staff working document, 2015)

Digitisation has an important role to play in many different areas (e.g. gender, good governance, transparency and accountability, the fight against corruption, job creation and private sector development, access to micro-finance, education and health).

The European Commission services are committed to reinforcing support for developing digital technologies and services in the context of the EU policy across four main priority areas:

- Promoting access to affordable and secure broadband connectivity and to digital infrastructure, including the necessary regulatory reforms;
- Promoting digital literacy and skills;
- Fostering digital entrepreneurship and job creation;
- Promoting the use of digital technologies to enable sustainable development.

2 Industry 4.0

Digitisation is part of the Fourth Industrial Revolution. The theme of the World Economic Forum in Davos 2016 was highlighted by Klaus Schwab's book "The Fourth Industrial Revolution", describing how digital technologies change our work, lives and societies.

There have already been three industrial revolutions in the past:

The First Industrial Revolution (1760 to 1840) from crafts to industry: mechanisation, steam power

The Second Industrial Revolution (1860 to World War I) gave us radio, telephone, telegraph, cars and mass production

The Third Industrial Revolution (World War II to the present day) – computers, automation

The fourth technological revolution makes labour costs less important and boosts the role of technology.

This reduces the need to relocate production elsewhere (China, India). Industry 4.0 is the current trend of automation and data exchange in manufacturing technologies.

It includes cyber-physical systems. Industry 4.0 creates what has been called a "smart factory".

Generally speaking, employees in future should have specific characteristics and skills that cannot be replaced by a computer at the moment.

People cannot be trained overnight to become IT managers.

- Education/training will gain more importance in a digitised world of labour.
- Other skills will be demanded.
- Employees will be expected to continue learning throughout their life.
- People will have to become more resilient and more agile.

3 The future of labour

Change is apparent in all sectors. It is happening everywhere:

- Industry (robotisation and automation, self-driving cars, drones, solar energy, 3D technologies etc.)
- Healthcare (use of smart phones, nanotechnologies in pharmacy, new approaches to medical research etc.)
- Green economy, smart homes and smart cities etc.
- Science (artificially intelligent robots, neurotechnological brain enhancements, genetic editing)

Many countries are seeing the emergence of new types of jobs that did not exist ten years ago: this is a constantly growing phenomenon. Forecasts indicate that 65% of the children currently starting school will in future work in new jobs that do not exist at present.

We already have shops where cashiers are replaced by self-checkout terminals; airports have self-check-in facilities and self 'drop baggage' points; there are already totally automated dairy farms, factories, seaport cargo terminals and self-driving cars together with many other things that sounded like science fiction ten to twenty years ago.

Since 1965, computer processing power has doubled every two years. All the computing power that it took to send man to the moon could now fit onto a chip inside your smart phone. In future, robots and computer programs will easily perform all kinds of routine jobs.

Future forecasts indicate that:

- The workforce will be less specialised
- There will be more white-collar and fewer blue-collar workers
- People will be less tied to a specific company in a specific country
- Blue-collar workers will be replaced by robots and migrant workers
- White-collar workers will be replaced by computer programs
- The boundaries between different industries will be less distinct

In twenty years, the following jobs will be performed by robots or computer programs:

- Commercial drivers and delivery workers
- Food service industry
- Healthcare
- Companionship
- Manufacturing and construction
- Security guards and military
- Service clerks
- Telemarketers and technical support

- Real-estate agents
- Journalists
- Pharmacists
- Teachers

4 New forms of employment

New information and communication technologies are having a big impact on work and life in the 21st century.

In combination with rapid technological development and the competition between countries, all these changes on the global market are calling out for more flexible relations on the labour market.

As a result, we are seeing rapid growth in atypical forms of employment across Europe and the world. Alongside standard forms of permanent, full-time work contracts, new forms of employment are becoming a reality for many European workers.

Atypical forms of employment are usually characterised by non-standard working time, specific employment contracts or other less common labour relations.

These new types of employment include telework, part-time contracts, temporary and agency work, crowd employment, job sharing, ICT-based mobile work and platform-based on-call work.

Atypical forms of employment are widespread in the service sector.

There are no official statistics, but research indicates that the Netherlands is the leading EU-28 country with regard to atypical forms of employment, which is well developed in Germany, Spain and the UK and less popular in Estonia, Latvia, Bulgaria and Lithuania. But new forms of employment are growing in Lithuania after a new Labour Code was adopted on 1 January 2017.

Almost one of five employees in Europe works from home or in public spaces at least several times per month.

New types of employment bring benefits and threats for both employers and employees.

Technological developments make the digital economy independent of time and space. Employees do not necessarily have to go to the office to work; on the other hand, the service they provide is expected to be available 24/7.

Typical examples of new forms of work:

- Job sharing, where an employer hires two or more workers to jointly fill a specific job, combining two or more part-time jobs into one full-time position
- Interim management, in which highly skilled experts are hired temporarily for a specific project or to solve a specific problem
- ICT-based mobile work refers to employment where the work is carried out at least partly but regularly outside the main office (be that the employer's premises or a customized home office), using ICT for online connection
- Voucher-based work, where the employment relationship is based on payment for services with a voucher purchased from an authorised organisation that covers both pay and social security contributions
- Platform-based on-call work. Here the employer signs an employment contract with the worker but does not commit to supplying work on an ongoing basis. Zero-hour contracts are the best-known example. These contracts are based on the principle that workers will be called in to work when they are needed
- Portfolio work, where a self-employed individual works for any number of clients, doing small-scale jobs for each of them

- Crowd employment, where an online platform matches employers and workers, often with larger tasks being split up and divided among a “virtual cloud” of workers
- Collaborative employment, where freelancers, the self-employed or micro-enterprises cooperate in some way to overcome limitations of size and professional isolation.

5 Social risks of digitisation

Labour law is being deregulated by digitisation:

- Who is the worker, who is the employer (hidden “employers”) – is this still an employment relationship?
- There is a risk of being disconnected by the platform without due process.
- Who can guarantee minimum wages, working time limits, holidays etc.?
- Quality of jobs (flexicurity, worker participation, skills)
- Health and safety issues (intensification of work, working time, psychosocial risks, burnout, work-life balance)
- Management issues (digital surveillance, data protection, transparency)
- Social challenges: unemployment and rising inequalities, deregulation (labour law, wage setting, collective bargaining), tax erosion and social security funding, growing social polarisation

6 Digitisation from the work-life balance perspective

In the past 15 years, new work arrangements have become more significant. This applies particularly to crowd working with the emergence of online platforms and ICT-based (information and communicational technologies) mobile work with the possibility of flexible workplaces, for instance home office.

These new forms have transformed the traditional one-to-one relationship between employer and employees, with both positive and negative consequences.

On the one hand, people can improve their work-life balance and boost productivity due to more flexible and individualised working-time arrangements.

On the other hand, new forms of employment are increasing the risk of self-exploitation, burnout, and social isolation for people working from home. Digitisation brings new opportunities, but it also poses risks for a healthy work-life balance. Employees on telework contracts need to know how to manage their time properly in order to avoid self-exploitation.

Research indicates that flexible working hours, autonomy and teleworking result in employees doing more overtime. This applies particularly to men in managerial jobs.

- Right to be disconnected

The right to disconnect is a proposed human right regarding the ability of people to not respond to work e-mails or messages during non-work hours.

The French government passed the El Khomri law to reform working conditions. The law included a chapter titled “The adaptation of labour law to the digital age”, Article 25 of which establishes the right to disconnect.

- Work-free day for European citizens

“Work-life balance is a crucial factor in the debate on health and safety at work. Sunday should therefore be established as a work-free day in the Working Time Directive” (MEP Thomas Mann).

The “right to have breaks, to be unavailable during leisure time and to have at least one work-free day per week” should be guaranteed for all workers in Europe.

We need to have the right to switch off our mobile phones, to be unavailable and to be able to end our working day.

7 Digitisation and robotisation from the gender perspective

Digitisation and robotisation from the gender perspective were described by Veselina Starcheva, expert from TU Podkrepa Bulgaria, during the seminar “Digitisation and robotisation of work. New challenges for trade unions”, organised by MOSZ (Munkástanácsok Országos Szövetsége) in Budapest.

Statistics show a 90/10 ratio between men and women in STEM (science, technology, engineering and mathematics).

The digital agenda should act as a driving force for gender equality and the participation of women in the digital labour market.

Once women have been introduced to digital technology, they will progress, acquire suitable education, become economically independent and be able to take and implement their own decisions.

Digitisation for women now plays the same role that work did for them in 1950, acting as a gateway to many opportunities.

During the 1950s, women began to fight for more involvement in the workplace and for the right to go to college!

Here is a simple example: how do women benefit from mobile phones?

- Women with mobile phones in every age group and place and of every socio-economic status are reporting an increased feeling of safety and security

- Mobile phones can help foster a sense of independence; 85% of women with mobile phones feel more independent
- Four in ten women in the low- and middle-income bracket enjoy greater economic & professional opportunities

Technology should and may be used to improve human rights and democracy.

Mrs. Starcheva shared good practice from experience at Podkrepa:

- Interactive internet platform of youth trade unionists
- Electronic trade unions (exploring new ways of organising workers, interactive communication and coalition building)

The digital era is prompting women to explore beyond their limits and is creating an atmosphere that is conducive for a multi-cultural and universal world.

8 European Union strategy regarding digital skills

The European Commission estimated that around 70 million Europeans lack adequate reading and writing skills, have poor numeracy skills, and more than 20% practically cannot work with computers.

According to the information from the Tallinn Digital Summit (2017), 44% of the European population do not have any basic digital skills, although digital competence will soon be required for nine out of ten jobs.

More than 30% of highly qualified young people work in jobs that do not match their talents and aspirations.

At the same time, 40% of European employers report that they cannot find people with the right skills.

Very few people have the entrepreneurial knowledge and competences to start their own business.

Forecasts indicate a shortage of 500,000 experts on the ICT (information and communication technologies) sector by 2020.

Since 2014, the European agenda has given priority to the digital sector and e-skills. Member states agreed to reinforce efforts in the Digital Skills and Jobs Coalition, and on 7 December 2017, the Commission launched the Digital Opportunity Traineeship Programme to help young people enter the labour market.

Other initiatives include the Code Week for many European schools and the Digital Skills Awards, presented to the best initiatives that encourage the development of e-skills.

9 Overview of seminars held

The digital world of work is part of the EU's "Europe 2020" strategy.

EZA (European Centre for Workers' Questions) continues its series of seminars on the "Europe 2020" strategy, focusing in particular on analysing the impact that digitisation of the world of work is having on workers, workers' representatives and the strategies of workers' organisations. In 2017, a study on the "Digital World of Work" was published by Susanne Kirchner and Barbara Angleitner, Institute of Advanced Studies (HIS), Vienna.

During the EZA educational year 2017/2018, six seminars were organised in the framework of a project co-ordination under the topic "Digital world of work – technological development and changes at the workplace".

Another project co-ordination about digitisation entitled "The impact of the digital world of work on the life of workers and their families" put an emphasis on socio-ethical considerations.

The coordinated project seminars for the topic "Digital world of work – technological development and changes at the workplace" are listed below.

9.1 Digitisation and robotisation of work in the automotive industry: new challenges for trade union work

4 to 5 May 2017 in Budapest, organised by MOSZ (Munkástanácsok Országos Szövetsége)

The seminar was divided into two sections:

- Will workers be winners or losers? The role of social dialogue
- Changing the world of work. Organising work. New role of social dialogue

Digitisation and robotisation have a huge impact on the European economy, especially in the industrial sector. The Industry 4.0 strategy has great potential in Central and Eastern European countries.

Manufacturing is a focal sector of the European economy. It plays a major role in the Visegrad region. Everyone can see how quickly new technologies are being adopted in all areas of life, with the usage of digital instruments playing a key role.

But one problem facing society is that the older generation cannot adapt quickly to new technologies. Elder people should be given training and support so that they can keep their jobs and compete with the younger generation.

In this field, Hungary has its own digitisation strategy. There is a real chance that at least as many jobs will be created by digitisation as are being lost to the economy. Digitisation must be made to serve the public good and the negative effects must be counteracted.

At the end of April 2017, a new programme was adopted to improve IT capacities. The intention is to prepare 20,000 IT specialists over the next 3 years, as deemed necessary for the growing economy to grow. This will entail partial use of ESF.

At the same time, the education system will be reformed with a focus on practical knowledge for students. Furthermore, a new approach is needed for lifelong learning.

Hungary should focus more on providing training rather than relocating industries. The country needs to invest more in education and requalification. It is currently facing problems in terms of labour shortage, particularly on the regional scale. There was a 2% growth in GDP in 2016, especially in agriculture, the service sector and the food industry, while recent years have seen a significant rise in wages.

Production is also changing. Hungary should shift its focus from supplying raw materials to supplying products with a high added value. A huge step has been taken from manual work to semi-intellectual work.

Laws will have to be brought in line with digitisation in future. Many jobs may be lost. Workplace rights have been weakened in some areas. However, labour market reforms are already in progress. Digitisation can make a contribution to economic growth, so that the seminar participants saw the future in a bright light.

9.2 The changing nature of the world of work, digitisation and the impact on labour law, wages, social security systems and social dialogue

18 to 20 May 2017 in Vilnius, organised by LPS „Solidarumas“ (Lietuvos Profesinė Sajunga „Solidarumas“)

The main topics of the seminar were:

- The future of work in the context of technological changes
- Decent work for all. Working conditions. Wages. Social security

- Changing the world of work. Work organisation. The new role of social dialogue

Kristina Krupaviciene, President of LTU Solidarumas, underlines that all these questions are currently very important for Lithuania as the country's parliament is about to discuss and adopt the new Social Model and a totally new liberal Labour Code.

Maria Helena Andre, Director of the Bureau for Workers' Activities (ACTRAV), ILO sent a video presentation on "The ILO Future of Work Centenary Initiative".

"Work, what it is and how we do it, is changing in an unprecedented way. It's changing our society as well, in ways that we could never have imagined. Globalisation, climate change, technological progress and rising inequality – these are key drivers of that change. New technologies have a big impact on traditional industrial relations. Low wages or the reduction of workers' rights are not the way forward in the current world of work."

Luis Colunga, Deputy General Secretary of IndustriALL, introduced an action plan for improving the situation in the industrial sector. It consists of eleven measures:

- Restart the economy
- Close the investment gap and upgrade the infrastructure
- Support the transition to a low-carbon economy
- Restore the broken transmission mechanism: savings must be turned into productive investments again

- Support innovation as the main driving force for industrial policy
- Reinvent the traditional industrial sectors
- Maximise the societal and economic benefits of ICTs
- Don't forget the demand side of industrial policy
- Sustainable, affordable and secure energy
- Don't forget the social dimension of industrial policy
- Free trade must become fair trade

Dalius Gedvilas, Vice-President of the Lithuanian Confederation of Industrialists, explained how Lithuanian industry can adapt to digitisation. He started with a few simple questions, asking for a show of hands from those who know how to use a digital signature and who can shop online in the supermarket using a smart phone app. Only a few participants knew how to use these possibilities of digitisation. This example is an illustration of Lithuanian society in general and the level of digitisation in daily life. New technology comes very quickly, but unfortunately we are not ready to accept it yet.

The speaker underlined the need for short-term and long-term strategic planning in the education system. Lithuania should have a national planning system that describes which kind of occupations will be in demand on the future labour market so that specialists can be prepared for the future in advance.

Without this kind of planning, society is wasting money by supporting an old-fashioned education system for professions that are not in demand and

with the subsequent need to retrain young people who cannot find work because the labour market has no demand for their occupation.

Kathleen Walker Shaw, Member of the European Economic and Social Committee (EESC), introduced EESC opinion (SOC/533) on “The changing nature of employment relationships”. During her presentation Ms. Shaw made some statements:

- The impact on the labour market and standards, economy, tax and social security systems and the living wage need to be assessed and grey areas in rights and protection addressed.
- The challenge is to encourage innovation and creativity and deliver positive outcomes for a sustainable and competitive social market economy.
- It is a priority to develop social welfare models adapted to cover more flexible forms of employment. This should be given consideration in the development of the EU Pillar of Social Rights.

She also spoke about Uber: “Uber is a transport company, according to EU lawyers. The American company Uber operates in the field of transport, and is not an information society company, a top EU lawyer said in advice to the Court of Justice of the European Union on Thursday (11 May). The court said in a press release that, according to one of the court’s advocates-general, “the service offered by the Uber platform must be classified as a ‘service in the field of transport’.”

During the legal proceedings, Uber offered additional benefits for some drivers, such as sick pay etc.

With this step, Uber confirmed its responsibility as an employer. The Uber case illustrates some of the threats of the sharing economy. People using

such platforms are just trying to save a few Euros, without knowing that in the case of an accident they could lose hundreds of Euros because Uber is not accountable in the event of an accident.

Paulius Vertelka, Director of INFOBALT, described a special IT training programme for women called “Women Go Tech”. This special programme aims to break with stereotypes and to promote IT occupations among women. Statistics currently indicate that there is a proportion of 90/10 male to female students on IT courses. There is therefore good potential for increasing the proportion of female IT students.

Thiebaut Weber, Confederal Secretary of the European Trade Union Confederation (ETUC), spoke about changes in the world of work and challenges for workers’ representation. The First and Second Industrial Revolutions introduced new aspects of labour relations, including labour standards, labour contracts, fixed working hours, trade unions and many other aspects that had not existed before.

We as trade union representatives should understand that the world of work is changing every day. We need to find new methods for protecting those who work in the new digital world of work: the self-employed, freelancers, online platform workers etc. We should make use of the experience gained by our colleagues in other countries where this kind of employment is already common practice, with successful organising strategies for the type of employees that are required.

9.3 From Industry 4.0 to Energy 4.0: proactive social dialogue as the key factor in establishing a socially acceptable technological revolution, restructuring and transition in the European energy sector

16 to 18 October 2017 in Brussels, organised by BIE Int. (Bouw, Industrie & Energie International)

The seminar discussions included a very important topic related to the energy of the future - Energy 4.0, the role of the social partners in the area of technological changes, restructuring and transitions in the European energy sector.

The main topics of the seminar were:

- Facts and figures on current and future technological changes in the European energy sector and the impact of these changes on employment and skills;
- The current policy options available to the EU and the Member States in energy, transition, climate and green skills;
- The link between “Industry 4.0” and “Energy 4.0” and the social partners’ role in supporting change and transition;
- Overview of good national and European practices;
- The position of the European social partners in the energy sector in light of all these developments.

The EU imports more than half of all the energy it consumes. Its import dependency is particularly high for crude oil (90%) and natural gas (69%). The total import bill is more than € 1 billion per day.

Industry and energy are very closely related. Some companies want to relocate production not because of labour costs, but because of high energy prices. Industry 4.0 makes big demands on energy resources. The energy sector needs to satisfy the growing needs.

Germany's "Energiewende" (the country's transition to a low-carbon, environmentally sound, reliable and affordable energy supply), dealing with climate change, the EU programme on green jobs and skills, the nuclear phase-out and the transition from fossil energy sources to renewables are all aspects that impact on the energy sector.

Sylvian Lefebvre, IndustriALL: Only strong social dialogue can protect workers involved in the extraction, production and supply of energy. Whole families, whole regions in Poland live on coal. If the Commission says coal is over, what will be the future for these regions?

Europe needs energy for production. China can supply cheap products. Belgium, France and other countries cannot do anything to prevent it. Europe needs a common policy for dealing with these problems. It is a question not just of investing in the new energy sector but also of supporting workers in the old energy sectors (e.g. the coal industry).

Ivo Belet (Member of European Parliament) gave a speech in which he indicated that we cannot say that coal will be phased out overnight. It is not realistic to say "coal will be over in 2020". Ecological ambition still has to take account of the economic situation, with cheap products being supplied by Brazil and China where there are less strict ecological regulations.

In the past, the EU has been somewhat naïve, failing to take sufficient steps against China. It needs a common strategy to prevent China from obtaining intellectual property rights to European technologies.

The seminar discussed the importance of social dialogue in the gas and energy sector.

One very important issue consists in retraining low-skilled older people (45+), especially in regions affected by new technologies.

Bob Van Passen, former secretary of the European Works Council at ENGIE, introduced best practice on proactive action in a changing sector by presenting the European Social Agreement negotiated by the representative European trade union federations EPSU, EFBWW and IndustriALL. This agreement shows that social dialogue does have an important role in the transition process.

9.4 The impact of technological innovations on the world of work and measures to secure jobs in the work-oriented society of the 21st century

20 to 22 October 2017 in Madrid, organised by CEAT (Centro Español para Asuntos de los Trabajadores)

The main topics of the seminar were:

- The 21st century labour society and its continuous adaptation as a consequence of ICT
- Impact of technologies on education as a resource for future jobs

- Promotion of continuous training in the face of digital transformation in trade union organisations
- The past, present and future of education and adapting it to the world of work
- Self-employment, telecommuting and other alternative jobs as a consequence of the information society
- Continuous training throughout the working life
- A vision of the digital world in education elaborated by the protagonists

Education and lifelong learning are becoming more and more important in the digital world of work. Nowadays, people need more digital skills in order to participate in modern society and to advance their professional careers.

The European Commission estimates that 70 million Europeans lack adequate reading and writing skills, have poor numeracy skills, and more than 20% practically can't work with computers which puts them at risk of unemployment, poverty and social exclusion.

It may be hard to imagine, but there are many people who don't have an iPhone and who don't know how to use it. For them, Twitter is still a sound, and the Amazon is still a river.

Marta Encinas spoke about education in Spain. Between 2006 and 2014, there was an increase in the number of occupations that require a university degree, so that people without this level of ability are at risk of being displaced by technology.

As in other countries, globalisation, technological change and other pressures in Spain are combining to reshape the structure of employment and the skill requirements of jobs.

Despite the many limitations associated with forecasts of future skill needs, including some drastic assumptions, they nonetheless provide useful insights into how the skill needs of the labour market may evolve in future.

Education should be a lifelong process.

Adults who reach a higher level of education enjoy better economic results.

Low-skilled adults in Spain are less likely to participate in adult education and training than their counterparts in other OECD countries. Only 19% of low-skilled adults in Spain participated in some form of formal or informal adult education or training in Spain in 2012, compared with an OECD average of 31%. Low-skilled adults in Spain are also less likely to participate in on-the-job training than similarly skilled counterparts in other countries. One major challenge identified for Spain is to improve the skills of low-skilled adults.

In Spain, close to 10 million adults have low levels of literacy, numeracy or both.

Roughly two-thirds of them will still be of prime working age ten years from now, and over one-third of them will still be of prime working age in twenty years.

In practical terms, people with less than level-2 proficiency in literacy or numeracy have difficulty with understanding simple written information and basic quantitative reasoning.

This does not imply that these individuals lack strong occupational skills.

However, as the skill requirements of jobs continue to rise, low-skilled adults will find it increasingly difficult to:

- Maintain current jobs
- Earn high wages
- Find new jobs, if necessary

The skills of young employees are also being underutilised in Spain. Employed Spanish youth are less likely to use computers at work than their counterparts in most other countries. More should be done to harness the skills of young people for their benefit and for that of society as a whole.

The transition from school to work is not always easy. In addition, this shows how important skills acquired in education are in the labour market.

Teresa Coelho, Director of Industrial Relations, Amazon Spain-Portugal. Amazon.com is the best example of the progress made by new technologies in our daily life. Some of the solutions used by Amazon sound like science fiction: robots in the warehouse help to reduce manual work, drones deliver the goods, there is the Amazon Dash Button single-function controller for ordering goods and many other new technologies.

The robots and new technologies used in Amazon warehouses are incredible. Many Amazon warehouses use autonomous robots to handle orders, with a zip shelving system where robots bring the entire shelf to an Amazon “picker” who places the purchased item in the order bin. These technologies save a lot of time.

The debates also discussed how the education system can be adapted to the needs of the future world of work.

According to Eurostat data, 3,722 million young people (under 25) were unemployed in 2017 in the EU. The lowest youth unemployment rates were observed in Germany (6.6%) and the Czech Republic (7.2%), while the highest were recorded in Greece (40.2% in August 2017), Spain (38.2%) and Italy (34.7%).

In the future, not only digital and technological skills will be needed to find employment.

HR managers are also looking for other kinds of skills, including creativity, leadership skills, teamwork, solving complex problems, communication, people management and task planning, as well as the ability to adapt to any environment and situation.

These skills cannot be acquired at university. Young people do not know how to work in team, how to behave at an interview or how to manage time and tasks.

Many youngsters still at school are not sure what they want to do afterwards.

Choosing the right profession is very important. It is often difficult for graduates to find work after finishing university. Companies have few jobs to offer, usually only temporary contracts. In Spain it is nearly impossible to get a good contract. Youth unemployment in Spain is around 38%, but at the same time there are around 2,000,000 foreign workers in Spain.

Another very important aspect discussed at the seminar was the role played by the trade unions. The phenomena of digitisation and technological dis-

ruption are having a huge impact on employment and the traditional economy.

Creating the “digital” union should be our response for the next generations:

- Appropriate use of information and communication technologies
- Development of specific apps: storage and utilities in the “cloud”
- “Online” support to affiliates, delegates etc.
- People orientation: trade unions should provide more new services for people, not just the traditional ones such as collective bargaining and collective agreements.

9.5 Keeping pace with technological innovation: continuous training

26 to 28 October 2017 in Bergamo, organised by FLC (Fondazione Luigi Clerici)

“We are currently preparing students for jobs that don’t exist yet, using technologies that haven’t been invented, in order to solve problems we don’t even know are problems yet.” (Karl Fisch)

The main topic of the seminar was the importance of new technologies in the education system.

Valentina Aprea, Councillor for Education, Training and Labour - Lombardy Region: from 2013, “Lombardia Web Generation” funds training measures to develop the digital skills of students of secondary schools and educational institutions.

The strategic objectives of this project are:

- To change learning environments through the use of technology
- To develop and implement training measures to increase the skills of teachers and students in digital teaching.

Requirements for access to the project:

- Lecturers in possession of digital skills
- Use of e-books.

Silvia Ivaldi gave a presentation that pointed to links between new technologies and the labour market.

The impact of the Fourth Industrial Revolution is:

- Change in employability (destructive effect vs. capitalization effect)
- Change in the nature and role of skills
- Change in the nature and organisation of work

The main questions for education are what to teach and how to teach.

The main ideas of the presentation were:

Curricula fit for the future: updated and adapted on a rolling basis; developed and revised collaboratively; subject to regular review.

Early exposure to work practice: envisioning a variety of career paths and equipping people with the relevant skills.

Digital fluency: technology is rapidly altering the way we interact and work

Culture of lifelong learning: building a lifelong learning culture moving from “education for employment” to “education for employability”.

Alessandra Santacroce, IBM Italia, said that every day we produce an enormous amount of data, 80% of which is difficult to analyse because it is contained in blogs, articles, research and reports.

Connectivity, business intelligence and big data, cloud, information security, mobile and social business are growing rapidly and changing the rules of the game.

IDC predicts that by 2018, 75% of consumers will interact with services based on artificial intelligence.

We already have a skill gap but closing this gap will become increasingly important in future.

By 2020, the technology sector in Europe will have 756,000 vacant jobs (source e-skills) with only 176,000 in Italy (source: Empirica).

Internet of Things: the main barrier that hinders its development is the lack of skills. According to Gartner, 47% of companies say that there is an absolute shortage of professionals in this area.

PwC Research: there will be a demand for 160,000 workers specialised in KET (Key Enabling Technologies) by 2025.

Italy is currently seeing many activities to close this gap. In 2016 alone, 2,200 children in 40 schools had lessons on topics such as augmented intelligence.

There is extensive collaboration between companies and universities: Politechnic of Milan, Catholic University, Bologna Business School, Sant'Anna School of Pisa, Humanitas and many others.

These relations between business and education are very important for Italy to remain a developed industrial country.

During the seminar, the participants had an opportunity to visit "Skills training space", a unique place where children and young people can bring out their potential. The centre is located in the Scholarly Institute of the Sacramentine Sisters of Bergamo. It intends to be a place where people can face the challenges of new technologies by managing them in a conscious way. This centre is for training in innovative technologies used by major companies such as Apple, Samsung and Microsoft, together with languages and tools. It includes curricular and extra-curricular laboratories, summer camps for children and teenagers from third grade primary school to first grade secondary school students.

Linda Trotta, Apple educational trainer, showed classrooms equipped with modern Apple computers. The training gives children digital knowledge about robots, art and graphic design, digital music, photo and video editing, virtual reality and many other skills.

9.6 The digital world of work

15 to 18 February 2018 in Manchester, organised by St Antony's Centre (St Antony's Centre for Church and Industry)

Kathleen Walker-Shaw, Member of the European Economic and Social Committee (EESC), gave a presentation that describes changes in the world of work.

Digitisation is increasing in many sectors such as manufacturing, banking, shopping, taxi services and many others.

All these changes have an impact on equality, because there is a high proportion of women in many of the jobs affected by digitisation (banks, retail, airports etc.).

There is also an increase in bogus self-employment or non-contractual status, because companies such as Uber do not consider their drivers to be employees.

Workers are often not covered by basic social security, rights to sick pay or maternity leave. Precarious workers often do not contribute to or benefit from social security and welfare.

The ILO (International Labour Organisation) report raises concerns about growing wage inequalities in the labour market due to the increases in new forms of work.

Trade unions face the following challenges:

- Highly unstable workforce with many employees working through agencies

- Employers/companies often hostile to trade unions
- Hard to organise employees
- Impact of deregulatory competition such as Uber on existing membership in the sector

But there is some progress in these areas. One significant victory in the EU Court of Justice confirmed that Uber and other such companies shall be treated as employers. The next phase will deal with Hermes, Amazon etc. Another important step is the European Commission's Pillar of Social Rights with transparent and predictable proposals on working conditions.

Dr. Christina Colclough, Director Platform and Agency Workers, Digitisation and Trade, UNI, spoke about workers' data privacy and protection. Data has been called the new gold. It is traded, analysed and used in marketing, advertising and human resources management.

According to forecasts, by 2030, 15-20% of the combined global GDP will be based on data flows. All of us leave a daily data trail: what we search on Google, flats we rent, what we buy online, loyalty cards, health records, phone calls to customer services, places we visit, emails we send, Facebook friends and many other items of information. In doing all of this, we are providing companies with data about ourselves and our families and friends.

We are also providing data in our role as workers, including CVs, biometric data such as our fingerprint or iris scan and other data used by employers to monitor our workflows. Human Resource departments use whole sets of data. All this data is used to measure employee productivity and efficiency.

Who actually owns the data we provide? The CEO of LinkedIn said that the majority of global data is in the hands of the Big Tech companies: Google,

Facebook, Amazon, Microsoft and Apple. A Twitter feed claimed that you can get a company to provide any information possible about a person for 1000 \$.

We know that some companies can manipulate our points of view. We now also know that US elections and Brexit referendum results were influenced and manipulated using data.

Many countries have data protection and privacy laws, but they do not cover the data harvested from monitoring workers.

Mac Urata, Sectoral Secretary, International Transport Worker Federation, spoke about the reality and near future for the transport sector. Self-driving trucks will help save costs, lower emissions and make roads safer. But automated trucks could reduce the demand for drivers by 50-70% (about 4.4 million) in the US and Europe by 2030. Even if the increase in driverless trucks dissuades newcomers from trucking, over two million drivers could be directly displaced in the US and Europe.

The speaker outlined four recommendations to help the transition to driverless road freight transport:

- Establish a transition advisory board to advise on labour issues
- Consider a temporary permit system to manage the speed of adaptation
- Set international standards, road rules and vehicle regulations for self-driving trucks
- Continue pilot projects with driverless trucks to test vehicles, network technology and communications protocols

In future, automation will have an impact not only on road transport but also on sea transport. The Norwegian chemical company Yara International partnered with Kongsberg Maritime to construct the world's first fully electrical and autonomous containership Yara Birkeland, which is scheduled to start operations in the second half of 2018 for transporting cargo between three ports in southern Norway.

In his presentation, the speaker underlined that we as trade unions are not against the use of 21st century technologies. We are against the revival of 19th century working conditions and employment practices.

Dr. Simon Joyce, Leeds University Business School, described in his presentation the main results of a survey on the social protection of workers in the platform economy.

The social protection of workers is guaranteed in the Treaty of the EU. The rise of the collaborative, platform or gig economy has led to a renewed focus on the question of social protection for workers.

It is difficult to understand what a platform or collaborative economy is without going into further explanations. As defined by the European Commission, a collaborative economy consists of "business models where activities are facilitated by online platforms that create an open marketplace for the temporary usage of goods or services often provided by private individuals" (Communication on the European Agenda for the Collaborative Economy, European Commission).

There are different forms of platforms, ranging from capital-oriented platforms where people offer property for sale or rent, to labour-oriented activities offering paid work and services.

The survey mentioned well-known examples such as Amazon Mechanical Turk, Clickworker, Uber, TaskRabbit, MyHammer and many others.

The platform economy is already an important part of economic life within the EU, and it is likely to grow significantly in the foreseeable future. Trade unions should be part of this future, too.

During the group discussion after the presentations, participants raised the following questions:

- Are we ready to face all the issues related to new forms of employment?
- Are we losing the social rights that we have won since the start of the labour movement?
- How can workers' organisations influence digital changes for people and for the community of work?
- How do we, as trade unions, address the danger of exclusion or insecure work due to digital development in the workplace?

At the end of the seminar, *Kevin Flanagan*, Director St. Antony's Centre, shared with participants his personal view on Catholic social thinking. He recalled the publication of *Rerum Novarum* in 1891 by Pope Leo XIII. The title itself – *Rerum Novarum* (“Of the new things”) – looked at the consequences of the Industrial Revolution, its impact on people, communities and global relations. Its primary focus was on the world of work and the impact of the „new forms“ of the work of the day.

Now new technologies bring new forms of work and new patterns of work. This can enhance human dignity but also destroy its true purpose. It can also destroy the dignity of the person doing the work. As in the words of Pope John Paul II: “Work is for man, not man for work”.

10 Future action: from Industry 4.0 to Trade Unions 4.0

What does digitisation mean for trade unions? We as trade union representatives should understand that the world of work is changing every day and we should look how technology can be used to our benefit.

Trade unions should become more flexible. We don't have the same situation as 20 or 30 years ago, when it was easy to organise people into trade unions in a big factory with 5,000 to 10,000 employees.

Trade unions should try to find new methods to organise workers in new employment forms: part-time or project contracts, telework and other new types of employment.

Representing a group of 1,000 "ordinary" employees in one of the traditional sectors is not the same as representing 1,000 multitasking employees with different interests and different degrees of bargaining power.

If we look at Europe from west to east and from north to south, we see that the situation differs. Trade unions in Scandinavian countries already offer membership and services for members working in new types of employment. In countries such as Lithuania, Latvia and Poland, trade unions have no experience in how to work with new types of employees and still focus on the traditional sectors.

Which should be the key areas for the trade unions?

- Minimum standards should be discussed – EU and national level – Social Pillar.

Digitisation is bringing about an individualisation of labour relations. A lot of people are without social rights. All workers in all sectors in all kind of employment are entitled to fundamental social rights, including lifelong learning. Trade unions should demand equal social rights for all kind of employees.

- New forms of employment

The employment status in new forms of work requires regulation with proper rights and protection including freedom to association and collective bargaining.

- Inequality

Measures should be taken to ensure that digitisation of the economy does not cause a growth in polarisation and inequality between highly skilled and low-skilled workers, between men and women, young and old.

- Lifelong learning

Workers' rights to re-education and training need to be expanded.

Continuous training in the workplace makes people more motivated and lets them feel more secure about their future. Companies that provide courses and training are telling their employees: "We think you're important, and we want you to stay with us. We want us to create a future together." It is important to include this in collective bargaining.

- Health and safety issues

The growth of new work models and new technologies has brought new challenges in terms of occupational health and safety with the intensification of work, working hours, psychosocial risk, burnout, self-exploitation and social isolation of those working from home.

- Data protection

It is very important that trade unions look for solutions to implement data protection for workers by means of company or sectoral agreements. Workers' data rights and data protection can be one of the new issues for trade unions in the digital world of work. Trade union representatives should know what kind of personal data is being collected.

- Digital management

Trade unions should think about ensuring that the worker does not become subject to permanent monitoring.

- Participation in decision-making

More action is needed on European and national level. Trade unions should put pressure on the EU and on national governments to implement a regulatory framework.

- International trade union network

Trade unions from different countries and organisations should share information, case studies and experience: it is vital that they support each other.

11 Sources and further literature

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