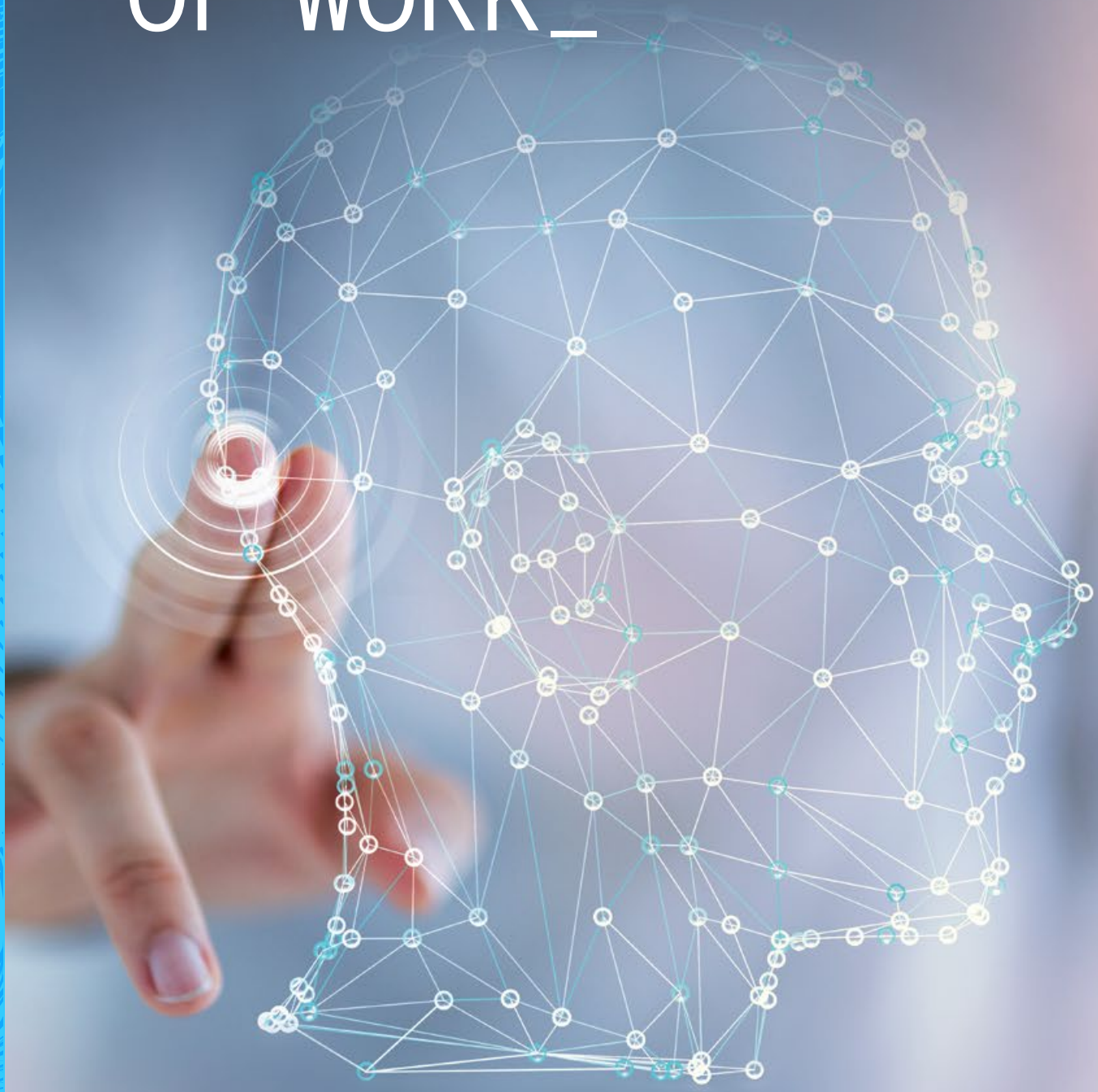
//DIGITALISATION AND THE WORLD OF WORK_



ceemet European Tech & Industry Employers

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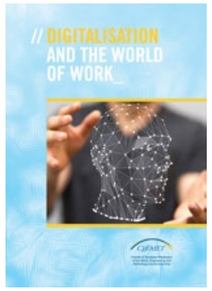
INTRODUCTION

A What has happened since 2016



When we published the first report in Ceemet's series on "Digitalisation and the World of Work" in 2016, the aim was to create a starting point for debate. This to provide necessary and compelling evidence of the fundamental changes taking place in work organisation – from skills demand to working time - as a result of digitalisation. We wanted to kick off a discussion that was facts-based and not guided by fears.

The response from both companies and policy-makers has been very positive, with many engaging discussions that have brought important questions about the future of work in industry to the fore.

The digital transformation is accelerating rapidly. New insights must be shared, input collected and brought together to maintain a relevant dialogue that lifts up the important questions and generates solutions. The second edition of the 'Digitalisation and the World of Work' report seeks exactly that. It eventually will help businesses, workers and policymakers boost a human centric digitalisation process in Europe.

B Getting on track

Digitalisation is no longer a novel concept; the significant potential it holds for manufacturing companies, individuals and European society as a whole, is uncontested.

Digital manufacturing technologies are transforming every link in the manufacturing value chain. From research and development, supply chain, and factory operations to marketing, sales, and service. Digital connectivity among designers, managers, workers, consumers, and physical industrial assets has the potential to unlock enormous value and change the manufacturing landscape forever. It opens up opportunities for enhancements in a number of key areas, such as increased competitiveness, better operational efficiency and safety, enhanced productivity performance, and the analytic use of intelligent plant data to inform strategic decision-making.

This transformation, however, requires strong investment - in infrastructure, new technologies and humans.

The lack of relevant investments is putting competitiveness and, consequently, Europe's high social standards at risk. Several of the global economic regions (and their manufacturers), that Europe competes against, have embraced the digital agenda. It is time for the EU and its Member States to act.

C Areas with looming issues

A lot has changed the last two years, trends have developed since, new best practices have arisen. We dig deeper in the areas that define the way we carry out work and that are up for change coming from digitalisation.

These are:

- Skills & Education
- Work organisation
- Occupational Safety & Health
- Data & the World of Work

This report is a next step in providing input to the debate about digitalisation and the changes it brings to our society and the way we work.

CHAPTER <1.0>

SKILLS AND EDUCATION_

IN BRIEF://

- Put Lifelong Learning (LLL) at the centre of digitalisation strategies to stay competitive and to tackle social inequality;
- Change structures, less so contents: an agile labour market requires flexible and responsive education and training systems for workers to acquire the right skills;
- Focus on Science, Technology, Engineering & Maths (STEM) and make Vocational Education & Training (VET) a 1st choice for learners;
- Integrate learning of digital technology and skills across all curricula and develop appropriate teaching methods with it. Digital skills should become part of basic education, just like reading, writing and arithmetic;
- Foster digitally savvy leadership to create new business (models), transform businesses and inspire a digitally skilled workforce.

Digitalisation holds great potential and could have a lasting and positive impact on companies, individuals and society as a whole. The potential to capitalise on the promises of digitalisation largely rests on having an agile workforce with the right skills.

How can we best ensure that people are rightly skilled and educated to meet the demands of a digitalised industry and society? How can we make sure that we do not waste any talent?

Recruiting people with relevant skills and competences as well as further training those already in work are a key challenge for employers. Today across the EU, there aren't enough skilled workers to fill all of the manufacturing jobs available. The skills gap, and in particular the mismatch between demand and supply is a major cause of reduced competitiveness for companies.

<1.1>

7 IN-DEMAND SKILLS_

65% of children entering primary school today will likely work in jobs that do not yet exist[1]. Therefore, it is tricky business to predict exact skills requirements. Nevertheless, we can identify a range of broad skills to cope with the new occupations and tasks.

1 Interdisciplinary skills

What – refers to a broad set of knowledge, skills and work habits that are critically important for success.

Why – developing and applying innovative solutions to complex challenges, e.g. the use of data analysis tools and production processes or mechatronics.

2 Computational thinking

What – is the thought processes involved in formulating a problem and expressing its solution(s).

Why – knowing in what way a computer - human and/or machine - can effectively carry out the solution.

3 Analytical skills

What – the ability to work with big data (analysis and use), make data-based decisions and create new business models based on data information.

Why – analysing the exponentially increasing amount of digital information generated from sensors and platforms.

4 System design skills

What – the understanding of how systems work and how to create added value.

Why – continuing the development of business models and/or reinventing them.

[1] World Economic Forum. (2016). The Future of Jobs. Geneva.

5 Cybersecurity skills

What – knowledge of how to regulate access to computer files, develop firewalls, perform risk assessments and test data processing systems to verify security measures.

Why – data is the new currency; the level of protection will determine both the security and success of a business.

6 Creative & entrepreneurial leadership

What – an understanding of how to create and transform new and existing businesses and create digital era firms.

Why – encouraging unconventional thinking and building mechanisms to reward innovative thinking.

7 Soft skills

What – the way we interact with each other. The ability to e.g. cooperate, communicate (across different -business- cultures) and solve problems.

Why – maintaining social and emotional intelligence in an agile working environment is instrumental.

<1.2>

DELIVERING THE RIGHT SKILLS_

The mismatch between skills demand and supply is not a new problem. What is different today for training and education institutions as well as for companies is the disruptive force of technological development and the difficulties entailed in responding quickly enough to those changes. Lack of flexibility and effective anticipation combined with problems attracting students to STEM subjects and VET, and an unwillingness to continue training, risks turning the skills gap in Europe into a chasm, with serious socio-economic implications.

Trying to determine how we can deliver training that will meet the rapidly emerging demands is perhaps the most pressing question in the manufacturing and technology-based industries. Both in terms of the existing workforce as well as in the education and training systems as a whole.

A serious barrier to developing digital competence in Europe is the lack of adequate digital skills and competences in the education systems. 75% to 80% of students are taught by teachers who are not digitally confident[2] . Schools across Europe do not have sufficient resources for relevant technological equipment or for updating or upskilling teacher qualifications.

So what can we do?

A Improve anticipation

Simply investing in more skills will not be sufficient – it has to be the right skills. This requires:

- Closer cooperation with companies (particularly Small & Medium-sized Enterprises - SMEs), social partners and other industry stakeholders.

[2] COM(2016) 381 - New skills agenda for Europe: working together to strengthen human capital, employability and competitiveness.

- More flexibility on the side of education and training institutions to be willing and able to quickly respond to new technology developments.
- Remove the bottleneck of knowledge by a wider sharing of good practices.
- Better coordination and streamlining in the policy response as there is much digital learning experimentation going on, but little coordination and scientific evaluation of outcomes.

It is near impossible to achieve an exact anticipation of skills in an ongoing process with an open end. However, driven by broad developments all efforts must be made to anticipate those developments and master and shape the skills that will be required.

B Speed up transition to individualised learning

We are slowly moving from a standardised approach towards more individual learning pathways.

It should be possible to more freely combine studies from different (VET) programmes (e.g. automation technology, mechanical and software engineering) and courses from different educational levels (e.g. from VET education and practice-oriented higher education). This is essential for education to reflect enhanced or new skills requirements.

C Rethink education & teaching

Digitalisation changes the functioning of our society. Consequently, education and training must adapt by focusing on:

1 Cooperation

- The educational revolution is built upon intensive and extensive collaboration. Governments, industry and social partners have to ensure that individuals can invest the time and means to (right) skill.
- Employers need to play a role in the design and development of curricula, making sure that courses reflect the development taking place in industry and the labour market.
- Where possible, government should facilitate teachers spending time in industry through work placements.
- Strategic cooperation between industry and higher education is imperative.
- Education providers need to develop attractive, open and inclusive ways to bring people in different phases of their lives and professional cycles back into education. This rests on having more flexible education and training systems, which work closely with industry.
- There is no need for the creation of completely new VET qualifications – already existing qualifications should be interlinked and adapted.
- Digital Innovation Hubs play a key role as one-stop-shops on a local level to (re)train SME employees. The skills output from these hubs need to be made available for wider use.

2 Digital literacy

- Basic coding should be introduced in every classroom, together with logical and critical thinking. This requires investing in teachers to be on track with the latest developments.
- Digital learning, both learning of digital skills and use of digital technology, needs to be integrated across all curricula.
- Teaching should provide students with an understanding of how technology and IT work and what the possibilities, risks and limitations are.
- 'Reverse mentoring' builds bridges in companies between young learners with a high degree of digital literacy and their senior colleagues.
- Studies in analytics and cybersecurity should be improved to ensure flexible, extensive and high-level education and training, offering workers the possibility of taking modules at higher level.

3 Changing mindsets

- The positive notion of training and learning throughout life needs to be introduced already in early childhood education.
- Ongoing training is a win-win situation for employees and companies. They must therefore both commit to it - the employer by allocating resources and the worker by investing time outside of working hours.
- Initiatives such as *Vocational Skills Week* are useful, but do not replace investments in first-class vocational schools.
- Policy makers must ensure parity of esteem and means between general education and vocational schools.

<1.3>

DELIVERING IDEAS – EACH PARTNER ITS FAIR SHARE_

We are in the midst of a dynamic process requiring all partners to get involved, experiment and try new pathways. If properly dealt with, a good digital skills set can narrow the social inequality gap.

To catch up, businesses must work closely together with governments and education and training providers to map a future view of digital skill demand versus supply, and together consider what a curriculum for the future might look like.

A EU level

Within its remit, the EU has recently been accelerating its efforts to highlight the importance of digital skills, STEM disciplines and entrepreneurial competences. However, these good initiatives alone will not be sufficient.

The "New Skills Agenda" (2016) served as a basis for later publications such as the Commission's Communication "Towards a European Education Area by 2025" (2017) and an "Education package" (2018) comprising a Council Recommendation. The latter focuses on the need to develop basic skills and soft competences in the context of lifelong learning. The package includes a "Digital Education Action Plan" to support the overall development of digital skills and competences.

For companies it is difficult to get an overview of what initiatives are taking place and where. The so called "European platform of platforms" on digitising industry of March 2017, is a good starting point to streamline and coordinate the different initiatives. This will facilitate the uptake of digital technologies and training.

A user friendly "EU one-stop-shop", would help companies, especially SMEs, to tackle their skills gap.

The post 2020 Multiannual Financial Framework must allocate more funding, including for sector or company level initiatives, for adapting the different facets of (initial) education and training to a "digitalised world of work".

Well-intended programmes make no sense if they are not easily accessible for industry. Or if there are no tangible results required.

B National stakeholders

1 Education policy

_LIFELONG_LEARNING_

Member States should focus on how training systems fully can live up to their responsibilities by involving companies in the (re)education and training of skilled workers.

The use of Vocational Open Online Courses (VOOCs) must be promoted as they allow SMEs to train their employees with the least disruption to production.

VOCATIONAL, EDUCATION & TRAINING

Governments need to contribute to shifting the perception of VET. This can be achieved through greater industry – school cooperation in governance as well as through offering work-based learning, teacher exchanges and apprenticeships. Fostering permeability between VET, general and higher education will make it easier for students to move between systems and thus increase its attractiveness.

_GENERAL & HIGHER_EDUCATION_

Member States should strengthen and promote digital education at general and vocational schools. A concrete way of increasing digital skills in Europe would be through the introduction of Chief Digital Officers in schools.

2 Social Partners

Social Partners should take up their natural role as facilitators by accompanying the digital transition on the work floor. Their activities will add value to the uptake of digitalisation in the industry.

This consists of:

- making concrete recommendations on the development of education policy and curricula;
- accompanying the digital transition on the work floor by developing appropriate training models for workers in the transition period.

3 Employees

Employees benefit as much as companies from ongoing training and therefore it must be understood as a joint responsibility. Dedicating a part of their free time constitutes a good possibility for the employee to contribute to the ongoing training effort.

C Industry

Industry's role can be summed up in C³: Cooperation, Coordination & Communication.

COOPERATION

Employers should reinforce their engagement with schools, colleges and universities to better articulate the skills needs of industry and to encourage young people to enter the industry.

ZOOMING IN

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Skills in Metal and Electro Industry – by SkillME

The manufacturing and technology-based industries employers' organisations GZS (SL), MASOC (LV), HUP (HR) & ZEP (SK) joined forces in 2014 with national Vocational Education and Training (VET) providers and regulatory bodies.

The purpose was to identify the most pressing skill gaps and develop trainings to close those. The wider objective was maintaining a productive workforce that can successfully compete on a global level while facilitating workforce mobility, flexicurity and cooperation among EU members.

SkillME developed curricula and training materials following the European Credit system for Vocational Education & Training (ECVET) and European Quality Assurance in Vocational Education & Training (EQAVET) principles.

+ 400 students and workers participated in pilot trainings developing their skills and increasing their competences. Since end 2017, all materials are freely available for open use and distribution on the project website Following the success of the project, the Alliance for advancement of VET was launched to keep the momentum.

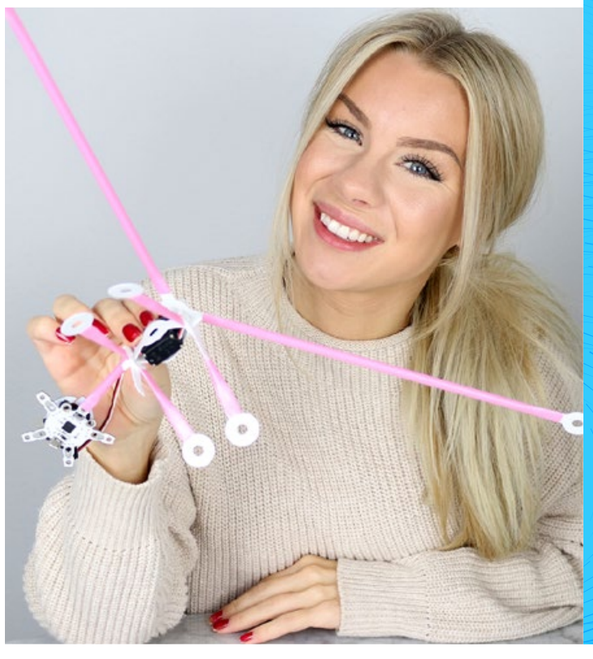
COORDINATION

Employers must understand the benefits of offering training and career perspectives to (future) employees for attracting and retaining top talent.

Companies must adopt a learning approach to cope with their own organisations' different (digital) learning requirements. SME's should consider how they, with lesser resources, can speed up learning.

COMMUNICATION

There is no point in cooperating and coordinating long-term efforts without communicating about it. This has to be done via the right channels and credible messengers, in the appropriate language of -next generation - workforce, schools and other stakeholders.



CHAPTER <2.0>

WORK ORGANISATION_

IN BRIEF://

- Digitalisation and globalisation have contributed to the emergence of increasingly common new ways of organising work. This has also had an effect on industrial relations systems and collective bargaining models;
- New technologies enable more autonomy and flexibility in terms of time and space, reflecting the needs of the company. Ultimately leading to benefits for both employees and employers;
- Companies have to become more innovative in managing work and develop new management styles better adapted to a digitalised world of work;
- The autonomy of the parties who conclude tailor-made solutions that fit the local context must be respected by legislators;
- Excessive as well as inconsiderate regulatory interventions are an obstacle for companies to adopt tailor-made solutions in a digitalised context.

To a large extent, the work models we see in the manufacturing and technology-based industries today have evolved out of work practices built for the industry of the past. Therefore, it is not surprising that over the past few years, the increased digitalisation of industry has progressively started to challenge traditional work models and management styles. They do not always fit with modern production requirements and employee needs.

Advances such as big data, Artificial Intelligence (AI) and the Internet of Things (IoT), coupled with higher product variety, lower lot sizes, mass customisation, shorter product cycles, production on demand, changing capacity utilisation, growing market volatility, and shorter delivery times, are deeply impacting the way work is governed and organised. By consequence, the traditional relationship between the employer and the employee too.

As boundaries go from general and defined to more blurred and individual, work organisation needs to adapt. This in terms of flexibilisation of production, working time and workplaces. Opening up to new forms of employment are beneficial for both employers and employees.

Companies have to transform and become more innovative in the way they think about

managing work. They have to gradually develop new forms of management attuned to a “digitalised work organisation”.

At the same time, employees, who to a lesser extent than before, are required to be present in a physical work environment or at specific hours, become responsible for defining and communicating their own boundaries.

To support EU businesses’ competitiveness in a digital global economy, and to facilitate the integration of manufacturing and technology companies into global value chains, national and European level working time and employment regulations must be sufficiently agile.

Inappropriate regulatory intervention is likely to hinder the ability of companies to provide the type of flexible working arrangements that also suit employees, create jobs and future prosperity.

To keep up with changing parameters, we believe the possibility to find tailor-made solutions that fit the local context will become more and more important. Therefore, Ceemet strongly promotes representative and autonomous social partnership at company and sector level.

<2.1>

FLEXIBLE WORKING HOURS_

Access to digital technology enables a greater degree of flexibilisation in manufacturing, including more potential for time autonomy.

The growing demand for more time flexibility is driven by both companies as well as employees. It offers new possibilities for improving work-life balance and further enhancing equal opportunities. These developments require an adjustment of the existing framework of legislation, collective agreements and/or individual contracts that governs work organisation.

A balance must be created between time autonomy and operational concerns. This can best be achieved jointly between employer and employee in order to take account of the employee’s requests, as far as possible, while always respecting the operational concerns and needs of the company. Increasing time autonomy also means that employees must take responsibility to comply with the number of working hours as stipulated in their employment contract.

Digitalisation and flexible ways of carrying out work make the lines between work and private life more fluid, which, if not managed appropriately, can lead to a (perceived) work intensification and/or to the possibility of being reachable all the time. In some countries, this issue has already successfully been dealt with by social partners.

EUROPEAN REGULATION

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Art. 9 of the Commission’s proposal for a Directive on Transparent and Predictable Working Conditions, if turned into legislation as it stands, will seriously hinder the competitiveness of companies. This article only allows employees to work within predetermined reference hours and only if informed a reasonable period in advance. Decisions relating to the planning of working time must be taken at sector or company levels in order to correspond to economic and social realities.

Despite the increasing digitalisation of the world of work, time flexibility is not a given right. Certain areas of work cannot be made more flexible time-wise. In production departments, for example, deadlines, attendance at work and shift plans will remain necessary also in the future. These areas are essential for business and have less opportunities for flexibility than other departments.

<2.2>

FLEXIBLE WORKPLACES_

Digitalisation can be expected to increase flexibility related to not only working hours, but also to the physical place of work.

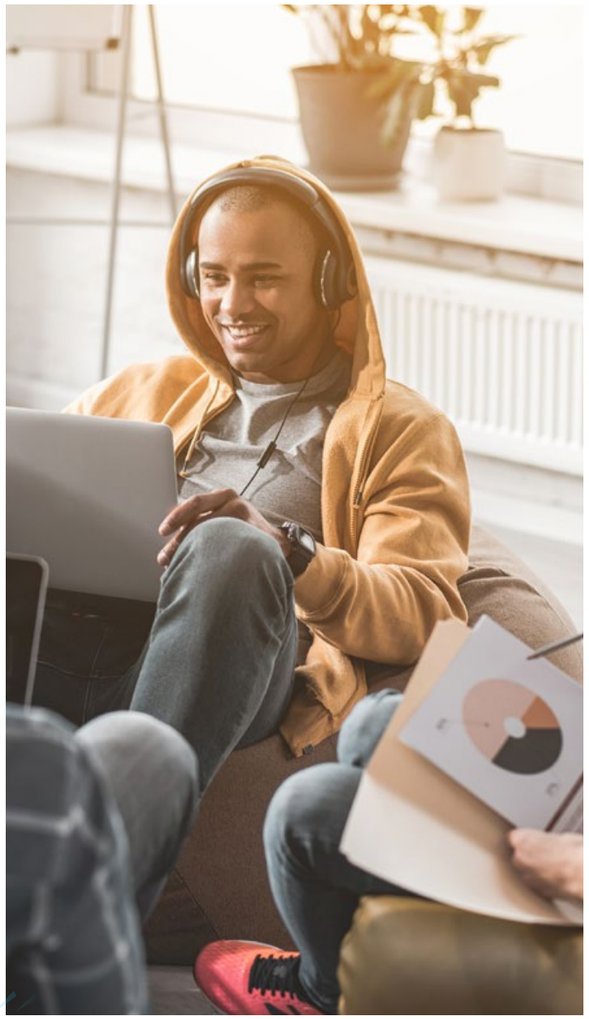
In general, mobile work equipment and the widespread use of ICTs provide the possibility to work online, thereby allowing employees to work outside the physical location of a “company”.

As with flexible working time, workplace flexibility offers people an option to improve their work-life balance and to advance equal opportunities in the process. This is evidenced by the gradual increase in demand for this option from employees.

However, again, workplace flexibility is not possible everywhere and this is particularly true for those sectors that produce heavy, bulky goods using heavy materials and machinery. Operational considerations must be taken into account here too, as in the case of flexible working hours. There will be departments or operating units in which the staff will still have to be present on a permanent basis.

Even in areas where mobile working is possible, a functioning sequence of operations must always be assured, and the workplace must be chosen accordingly, i.e. in a way that serves this purpose.

Therefore, it is up to the company to take decisions about “flexible workplaces”, while taking into account employee requests.



<2.3>

FLEXIBLE FORMS OF EMPLOYMENT AND DEFINITION OF ‘WORKER’_

Flexible workforce is today one of the most important competitiveness factors for European industry to rapidly be able to respond to fast-moving technological developments. The predominant use of full-time, open-ended contracts with one employer is the product of an earlier industrial age, where production and products were more standardized.

The changes to products, production processes and work organisation driven by technological development underscore the importance of evolving employment arrangements accordingly. While open-ended contracts continue to represent the majority in the manufacturing and technology-based industries, flexible forms of employment allow employers a margin to deal with fluctuations in demand. This provides speedy and efficient deployment of rightly skilled workers for periods when orders diverge from ‘normal’ or when difficulties in the supply chain affect production. As with flexible working time and work places, it is not only employers that are looking for more flexible forms of employment; employees are increasingly asking for flexibility here as well to boost their career opportunities and/or achieve a better work-life balance.

Digitalisation also opens up the field in recruitment and composition of the workforce. Cooperation/work between internal staff and external specialists in mixed teams with changing composition and the integration of highly qualified service providers for specific activities are already a reality today.

However, work developed within virtual teams across borders (in different time zones) for the same company or between companies (i.e. independent professionals, crowd working etc.) raises questions about integration, remote leadership and supervision – in addition to the necessary adjustments in qualifications, working hours and the workplace. These issues need to be addressed to make European labour markets fit for purpose. Overregulation in this field will be detrimental for both employers and employees.

EUROPEAN REGULATION

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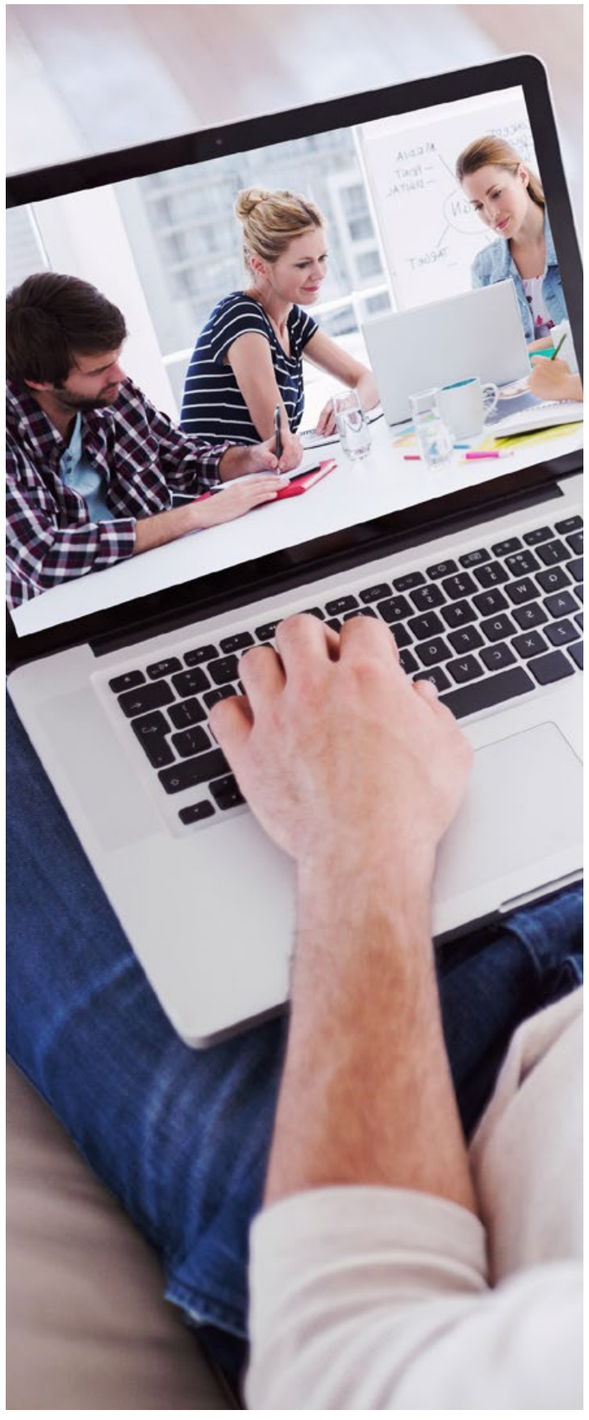
Current EU-level legislative proposals issued in the social policy field, following the introduction of the European Pillar of Social Rights, risk hindering the ability of companies to provide flexible work arrangements and will obstruct the creation of new work models that arise from an increasingly digitalised reality.

The definition of 'worker' should not be regulated at EU level. The very broad EU-wide definition of a worker, as it has been proposed in the Directive on Transparent and Predictable Working Conditions, impacts the use of flexible forms of employment and therefore will not be able to support the needs of companies in a digitalised economy.



<2.4>

COLLECTIVE BARGAINING_

Industrial relations are characterised by many different models across Europe. In several of those models, collective bargaining systems play a prominent role in determining working conditions and regulating the employment relationship.

The past financial and economic crisis (2008-2014) proved that those Member States with strong industrial relations, social partners and social dialogue systems, were more successful in dealing with the economic and social challenges that emerged as a consequence of the crisis. Labour markets in those countries also proved to be more resilient to the crisis effects[3] .

But these systems do not operate in a vacuum and are not immune to change. The current rapid digital transformation of the economy poses new questions about how industrial relations and collective bargaining systems are articulated.

The emergence of the platform economy raises questions about coverage and national boundaries since the "new actors" of the platform economy are not represented by the traditional social partners. Furthermore, the traditional employer – employee relation does not fully fit with this particular emerging economic and business model.

Strong and representative social partners are best placed to deal with these challenges and bargain around new issues that emerge as a consequence of a "digitalised organisation of work". New solutions agreed by the social partners remain, thus, of central importance in shaping the world of work.

State intervention must be avoided. It should only be used when necessary, in order to support the parties to collective agreements in their function and to maintain social partnership in a changing digitalised world of work.

ZOOMING IN

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Responding to needs of an agile labour market – by Teknologiateollisuus

Teknologiateollisuus, the Technology Industries of Finland employers' organisation, reached an agreement on joint guidelines with white collar trade unions on telecommuting. This agreement was first deployed for the IT specific sector and has now been extended to the manufacturing and technology-based industries.

Although the joint guidelines are voluntary guidelines and not provisions, it remains a crucial step. It shows that social partners acknowledge the benefits digitalisation brings to modern, productivity-enhancing working hours. With these new ways of working social partners recognize and respond to the changing needs of an agile labour market. Using their autonomy to experiment will eventually lead to models that are an answer to the sector specific needs.

Companies in the tech and industry sector in Finland have now the possibility to use these joint guidelines and templates when agreeing on remote working or so called "tele-working".

[3] European Commission. (2014). Industrial Relations in Europe. Brussels.

In the same line, increasing EU intervention through the European Semester to influence on wage-setting mechanisms must be avoided.

It is the task of the collective bargaining parties to keep themselves relevant and make the most of their room for manoeuvre. This room for manoeuvre is nowadays crucial for the social partners to innovate and best adapt collective bargaining to the increasing digitalisation of the industry and the changing world of work.

The autonomous social partners and collective bargaining needs to be complemented by:

a. The possibility by labour law to deviate from specific provisions/regulations in order to protect existing collective agreements or to allow and promote new ones;

b. (sectoral) Collective agreements that also provide "scape valves/opening clauses" that leave enough room for manoeuvre for the social partners to agree and encourage customised agreements which are best placed to provide flexible solutions to a changing world of work.

CHAPTER <3.0>

OCCUPATIONAL SAFETY AND HEALTH_

IN BRIEF://

- The industrial sector in Europe has become a safer place in the 21st century, largely due to companies investing in automation and digital technologies;
- Data collection allows to improve Occupational Safety and Health (OSH) turning work environments into even safer places;
- When working away from the primary workplace employees must ensure the application of the company's OSH policy;
- Based on compliance, smart sensors can be used for direct OSH improvements ensuring health and safety standards are met in real time.

Digitalisation of industry has the potential to provide exponential benefits to Occupational Safety and Health (OSH) in our industries, primarily by removing workers from hazardous environments, but also through the automation of tasks and the use of smart Personal Protective Equipment (PPE), including exoskeletons. Additionally, the ability to integrate data capture assets and predictive analysis systems that, through streams of information, can identify equipment deficiencies before they turn into failures will inevitably lead to further gains in OSH.

There are positive effects for workers in terms of improved quality of work by the continued automation of mundane jobs, as increasing levels of automation and robotics and improvements in ergonomics decrease the level of arduous or physical work. Further, OSH can be improved by computer-based handling of large volumes of information as this can permit better planning of workforce deployment, taking into account a worker's individual availability, skills and stress situation when assigning tasks. Digital technologies also open up new ways to communicate OSH best practice with workers, e.g. through the use of social media, and the use of online training courses such as Massive Open Online Courses (MOOCs).

We further explore some of the opportunities and challenges for industry in the field of OSH that come with digitalisation.

<3.1>

OSH & REGULATION_

It must be recognised that there is already existing legislation in relation to digitalisation, e.g. the Machinery Directive, 2006/42/EC.

EUROPEAN REGULATION

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The most fit for purpose directive to regulate the OSH area is the Directive 89/391/EEC – the OSH "Framework Directive". Risk assessment and good guidance provide some of the best tools for employers to deal with any adverse effects of digitalisation within industry.

Digitalisation opens up for incredible gains in workplace health and safety, but there are challenges as well. These technical, and subsequent OSH changes are issues which companies, employer organisations and where appropriate social partners have experienced and dealt with for many years. In most countries, due to their proximity to the business and ability to act swiftly (also when consulted about legislation), industry stakeholders are best placed to deal with these issues, particularly in relation to the operations of Small and Medium-sized Enterprises (SMEs). We must not stifle the uptake of digitalisation by companies by overregulating this overall societal benefit. Social dialogue, not inflexible legislation, can be key to ensuring that the OSH benefits of digitalisation are realised.

The next EU Framework on Health and Safety at Work post 2020 must anticipate the benefits of OSH and digitalisation, foresee the dissemination of best practices and the exploration of non-legislative measures to deal with digitalisation of industry. More EU funding must be allocated for research into the benefits of digitalisation on OSH, e.g. through the European Agency for Safety and Health at Work (EU-OSHA).

<3.2>

DATA & SAFETY_

Data is the fuel driving the economy; it is in everything we do in our private and our professional lives. Digitalisation and big data offer many opportunities for improvement in OSH. But these improvements hinge on the collection and analysis of the data available. At the workplace we must find a balance between the activities of the employer and the data protection of the employee. From a Ceemet perspective, we feel that the General Data Protection Regulation (GDPR) deals with many of the ongoing issues in this area and will provide a framework where data collected from workers will be managed safely. This is dealt with further in the chapter "Data and the World of Work"

EUROPEAN REGULATION

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Smart sensors can also be used for direct OSH improvements, such as measuring real time air quality and noise levels in factories. Digitalised workplaces that make use of sensors in this capacity can set parameters with actionable data to fully ensure health and safety standards are met at all times, building operations on the foundation of compliance.

A Sensors

The collection and processing of data has been greatly improved by the development of sensor-based technology. Touch and impact sensors allow employees and machines to work in tandem as these sensors can detect when an employee is about to be injured and stop the machine before it happens. An example of this could be the warning of a driver of a shovel loader in a mine leaving the track or improving (truck) driver safety by using data to help predict when parts would fail.

B Cybersecurity

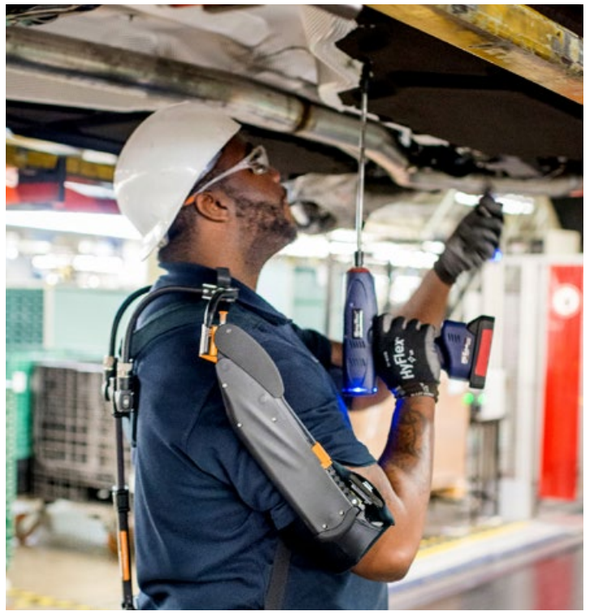
The success of a digitalised EU industry relies heavily on its security, and none more than its cybersecurity. The advent of the Internet of Things (IoT) has left open the possibility of machines being hacked to destabilise the production process, potentially causing accidents.

Companies are working hard to mitigate cybersecurity threats to protect their intellectual property rights, to ensure the safety, security and data protection of employees and, not least, to maintain customer trust.

<3.3>

MAN-MACHINE INTERACTION_

Technology and industry employers have many years of experience with automation and robotics. The OSH benefits of working in tandem with machines are clear to be seen. Employees are experiencing healthier and longer working lives because of the introduction of new machinery. The disappearance of heavy, monotonous and hazardous tasks is just one way in which employees within the manufacturing sector are benefiting from industrial automation and robotics.



A Cobots & sustainable work life

The increased use of cobots relieves physical stress and creates a workplace which is fit for all ages. Cobots allow workers to remain in work longer, thereby increasing the workforce at a time when industry needs more skilled workers.

This technology is steadily developing. With AI making its way into manufacturing as the technology matures and costs drop, cobots can become truly collaborative and work productively with their human colleagues. For instance, better sensory capabilities in robots could enable them to better interact with – and take instructions – from humans. Policymakers will need to leave room for innovation in relation to these developments.

Increasingly introducing more machines that work alongside humans is not without its challenges and employees can be fearful of this development. Therefore, digitalisation of work should be done in tandem with employees, as continuous involvement of the workforce in this area will result in a smoother transition. The cooperation of trade unions in this area is key. Raising awareness within its membership will facilitate this evolution, and its OSH benefits. However, this does not imply the acquisition of codetermination or information and consultation rights.

B Intelligent PPE & smart devices

We can reduce the risk of injury, when using complex systems, through intelligent personal protective equipment. Intelligent devices, such as earmuffs, which allow speech and normal sound, but which observe e.g. the sound of explosion and prevent it to get into the ear are preventing workplace accidents.

ZOOMING IN

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Exoskeletons: PPE in industry – by BMW Group

Innovative Personal Protective Equipment (PPE) such as exoskeletons are worn directly on the body and can act like a second skeleton, i.e. as an external support structure for the body.

The BMW Group uses both upper-body and lower-body exoskeletons. The exoskeleton vest for the upper body strengthens the movement of the upper arms of people who have to carry out tedious tasks. The vest's joints have an integrated mechanical spring support that gives arms greater strength. 24 of these exoskeleton vests are currently in use, 44 more will be added over the course of 2018.

Lower-body exoskeletons act as a chair-type support. This kind of exoskeleton improves workers' posture and offers relief in carrying out assembly tasks that require crouching or remaining in other positions that might affect people's OSH. On top of that, the leg support structure can transform prolonged standing into sitting and thus improve the comfort and flexibility of working conditions. The exoskeleton consists of movable splints that can be affixed to the legs or torso and locked in different positions. At present, 11 lower-body exoskeletons are used.

The issuing of smart devices to employees is, in many cases, a necessity for them to carry out their work.

C Artificial Intelligence

AI is transforming our economy and society, but it will also change the nature and location of work in a digitalised industry. This will bring both opportunities and challenges. AI offers new business opportunities to industry and contributes to productivity growth. Self-regulation must play a role in the era of AI, legislation cannot deal with all OSH issues in the digital era, however regulation such as the GDPR is indispensable to ensuring the data protection of employees is respected.

The analysis of, often thousands of, job security reports which report on hazard locations, slips, or more serious accidents at work is a large task. Health and safety representatives can only be expected to do so much at an enterprise. NLP (Natural Language Processing) is capable of processing thousands of digital documents, in any language. For large companies, this will produce a database of incident and accident reports, across all of their sites.

D Autonomous vehicles in factories

The use of autonomous vehicles is now commonplace, and they are used to move loads around factories. The OSH issues surrounding their use and the training needed for their implementation is a key topic for manufacturing employers. Indeed, evidence is pointing towards a reduction in accidents due to their usage at production sites, e.g. a reduction in accidents involving forklifts since companies have introduced autonomous forklifts.

Drones in industry are becoming more prevalent, one way in which they are being used to the betterment of employees OSH is moving items around production sites at height.

<3.4>

MOBILE & REMOTE WORKING_

Digitalisation enables more flexible patterns of working. This can contribute to improve health and well-being and allow people to better manage their work and private life, an issue which is currently high on the European political agenda. More flexibility brings advantages to the employer and the employee alike, so it is not surprising that both parties have expressed interest in flexible forms of work. In this area, there is a joint responsibility of employer and employee to ensure OSH. Employers continue to be responsible for the OSH of their employees. However, when working away from the primary workplace, it is the employee who must ensure the application of the company's OSH policy.

A Remote working

Remote working has been an important workplace innovation in previous decades and can have positive consequences for work-life balance, based on e.g. reduced commuting times. However, challenges remain in applying OSH legislation and in supervising working environments outside the employees' normal place of work. It is for this reason that we must ensure good guidance and best practice to control risk during remote working.

B Mobile working

It is difficult to see how traditional OSH practices can be applied to mobile working. There are factors outside of the workplace, or traditional second place of work, that simply cannot be controlled. These include background noise and ergonomic issues. It is therefore imperative that employees who are engaged in this type of work are given guidelines to control risk, rather than stringent rules which cannot be implemented.

CHAPTER <4.0>

DATA AND THE WORLD OF WORK_

IN BRIEF://

- Data protection is a top priority in societies and economies where data have become the new currency. Data protection must be well-balanced so that - big - data can be used in a safe way and help to create business opportunities and growth;
- There was a need for uniform rules on data protection, now provided by the General Data Protection Regulation (GDPR). Derogations must not undermine the European level playing field in data protection;
- The Commission, together with Member States' Data Protection Authorities (DPAs) should do more to make citizens, companies far more aware of GDPR and its requirements and benefits;
- GDPR, as any other piece of regulation, must be practicable and not disproportionately bureaucratic. The "GDPR one-stop-shop" must swiftly become fully operational;
- The Commission has a key responsibility for a consistent implementation of GDRP across the EU.

Big data is the new currency of the economy. The ability of companies to collect, analyse and use data provides opportunities for a new, innovative and more internationally competitive digital manufacturing industry (4th industrial revolution). And will bring benefits for consumers and workers as well as businesses.

This revolution must be appropriately accompanied by well-balanced regulation. In the employment context, regulation must support employees and employers using new technology and data in ways that are beneficial to both. It is obvious that personal data has to be treated in a different way than other data, which does not identify living individuals, such as the levels of production or technical specifications. Legal provisions should not conflict with the secure processing and subsequent use of data.

<4.1>

HOW GDPR SUPPORTS INDUSTRY_

Arguably, legislation has not kept pace with technological progress and the development of big data, and past incidents involving large scale leaks of personal data have underlined the need to revise the EU's legislation. With the entry into force of the GDPR, Europe is aiming to become the global leader in data protection.

The GDPR has put data protection in Europe on a new footing, with uniform rules across Europe applied by any company operating within the EU or dealing with EU based businesses. It will provide individuals with greater control over their personal data and to simplify the regulatory environment for business, by overcoming the fragmented 28 national data protection regulations.

Properly and safely managed data can help create new business opportunities and support growth in a sustainable way, e.g. the European eCall emergency call system, that automatically informs the nearest emergency centre with relevant location data in case of an accident. Big data also improves production processes and resource efficiency, e.g. precision farming with farm vehicles deciding whether or not, and in what quantities, to use herbicides by analysing visual data.

A The employer – employee relationship

For companies where no formal worker representations exist, it is essential that individual employees give their informed consent for the collection, use and processing of personal data. Ambiguity leading to worker and company uncertainty has to be avoided, which can arise when opt-out consent processes are used. The GDPR provides a framework for the collection and processing of personal data – elements of it are overly bureaucratic and not practicable, in particular for SMEs. Proportionate and practicable solutions that do not undermine the aim of uniform data protection rules across Europe have to be developed swiftly.

The need for a level playing field also applies in the context of data and employment, in order to avoid a fragmentation of national regulations by the use of derogations.

GDPR rightly recognises the legitimate interests of multinational businesses in the international transfer of employee data, in particular for the purposes of centralised personnel administration. In principle, the same legitimate interests apply to nationally operating companies, mainly SMEs, with regard to the performance of the employment contract, e.g. personal data necessary for the payment of salaries, the management, planning and organisation of work, and safeguarding health and safety.

Employees' interests are appropriately protected by the GDPR. Previously, the 1995 EU Data Protection Directive granted data subjects, such as employees, a right not to be subject to a decision based solely on automated processing, e.g. based on data collected by sensors at the workplace that could be used to measure performance at work. These protections have now been enhanced in Article 22 of GDPR, recognising that a delicate balance must be struck between the interests of employers and the data of their employees.

B The legal certainty

Inter-connected, web-enabled devices (smartphones, desktops, tablets, vehicles or wearables) enable the tracking of employees over time and in certain cases outside of their workplaces or work hours. This calls for certainty in the processing of work related data which is in the legitimate interest of the company, while respecting the privacy of individual's data. The EU's Article 29 Working Party provides some guidelines for the legitimate use of new technology in several specific situations, such as for mobile device management or monitoring of home and remote working. Illegitimate processing is considered to be when a company uses such a system to monitor the availability, performance, and customer-friendliness of employees. Others include using data collected via a CCTV system to regularly monitor the behaviours and performance of employees or using data of geolocation systems to constantly check an employee's movements and behaviour, as such tracking may infringe privacy rights of employees.

The Commission and the EU's independent Article 29 Data Protection Working Party should look into developing solutions that help improve clarity in the application of GDPR and propose adjustments, which are likely to become necessary. The Working Party must be in a close and permanent exchange with industry to ensure the practicability, relevance and proportionality of its work.

<4.2>

WHERE GDPR CAN BE IMPROVED_

The basic approach of data minimisation of GDPR is that only the least amount of personal data should be retained. But it runs the risk of failing the future-proofing test as businesses today cannot easily predict what data they will need in the future. Thus, GDPR could eventually create barriers for innovation, affecting start-ups or the development of companies. The EU must critically scrutinize the appropriateness of this approach and be alive to developments in business which might be stifled by the GDPR.

GDPR needs to be open to readjustments in the future to ensure that it remains workable, applicable and adaptable. For example, GDPR might force companies to ban the private use of a company phone, which could restrict the patterns of work employers can offer and restrict workplace flexibility.

The Commission and DPAs, thus Member States, should do more to make citizens and companies, (including importantly SME's), far more aware of GDPR and its requirements and benefits. Currently there is much uncertainty, and little EU or member state level investment in familiarisation, affecting companies' ability to invest in and finally comply with GDPR.

Ceemet members are actively engaged to resolve uncertainties and assist their membership, e.g.: offering series of national training seminars for manufacturers, backed up with company level advice and support.

ZOOMING IN

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GDPR Compass – by Agoria

All organisations located in Europe will have to comply with the General Data Protection Regulation (GDPR). This regulation imposes new, more extensive legal obligations on them. A lot of uncertainty existed on what and how the GDPR would have applied. Additionally, if a company had the intention to implement the regulation, where should it start? That is why Agoria, the Belgian sector organisation of the tech industry and a Ceemet member, developed an online tool, a compass.

In a highly complex topic, the aim of the GDPR Compass is to keep the process as accessible as possible. The process therefore:

- Uses simple yes/no questions for the diagnosis of data processing;
- Has pop-ups providing additional information on terminology and concepts;
- Lists the key measures to be taken to comply with the new legislation;
- Summarises the actions to be taken in a report that can is for internal use and/or for inspection by the auditors.

By guiding companies step-by-step to become GDPR compliant, industry is taken up the role as facilitator and explaining how compliance can be achieved, in an understandable language.

The Commission's guidance to facilitate a direct and smooth application of GDPR of January 2018 is a small first step but left little time to have any effect before the GDPR came into force. The Commission's 'GDPR one-stop-shop' must swiftly become fully operational. Although, lessons should be learned from experience with other European one-stop-shops, such as the Enterprise Europe Network (the last EEN evaluation considered that its consistence, quality and visibility were not sufficient[4]) or the Executive Agency for SMEs, whose 'SME instrument' - according to own reporting - has to become more relevant and easier to access for start-ups and breakthrough innovators[5].

It is a positive development that the GDPR has introduced a basis for uniform and clear rules for all Member States, but derogations must be restricted and minimised so as to avoid a plethora of regulations that would undermine GDPR's goal of creating uniform European rules. The required measures and information requirements arguably go far beyond the goal of uniformity and data protection and are only necessary for companies that solely or mainly earn their income from data management. There are today many companies in the manufacturing industry where data processing only plays a supporting role in the actual business, but which now have to comply with far-reaching and overly burdensome information requirements. This will put disproportionate costs on certain companies, rendering them less competitive.

The use of derogations must not run counter the overall goal of a real European level playing field in data protection.

[4] European Commission. (2015). Final evaluation of the impact of the Enterprise Europe Network 2008-2014. Brussels.
[5] European Commission. (2018). We need your investment expertise! on 28/01/2018 via https://ec.europa.eu/easme/en/investor

<4.3>

NEXT STEPS OF GDPR_

Moving forward, manufacturers need a consistent implementation of the GDPR across the EU by all Member States. This will be a major stepping stone for the completion of the Digital Single Market. However, the regulation must continue to be reviewed to ensure they are fit for purpose and flexible enough to ensure it helps, rather than hinders, the unlocking of the great opportunities of the 4th industrial revolution.

The Commission has a key coordinating responsibility, ensuring that all Member States are fully committed to swift implementation of the regulation, properly balancing business interests, and consumer and data subject interests.

ceemet

European Tech &
Industry Employers

Who is Ceemet?

- Ceemet represents the **Metal, Engineering and Technology-based industries (MET)** employers in Europe, covering sectors such as metal goods, mechanical engineering, electronics, ICT, vehicle and transport manufacturing.
- Our member organisations represent **200 000 companies** in Europe, providing over **17 million direct jobs and 35 million indirect jobs.**
- Ceemet is a recognised **European social partner** at industrial sector level. Our vocation is promoting global competitiveness for European industries through consulation and social dialogue.