

A person wearing a blue shirt and an orange safety vest is holding a magnifying glass. The lens of the magnifying glass is focused on a glowing, wireframe globe of the Earth. The globe is surrounded by a complex network of white lines and dots, representing digital connectivity. The background is a blurred blue and orange, suggesting an industrial or safety environment. The overall theme is digitalisation in occupational safety and health.

# // DIGITALISATION AND THE WORLD OF OCCUPATIONAL SAFETY AND HEALTH\_



# CONTENTS: //

—  
INTRODUCTION ////////////////////////////////// 4

TECHNOLOGY AND PANDEMICS ////////// 4

APPLICATIONS AND SENSORS ////////// 5

1. COLLABORATIVE ROBOTS  
(COBOTS) ////////////////////////////////// 6

2. FLEXIBLE WORKING ////////// 6

3. NEW FORMS OF MANAGEMENT // 7

4. SENSORS & SMART PERSONAL  
PROTECTIVE EQUIPMENT (PPE) /// 7

5. ERGONOMICS & EXOSKELETONS //// 8

6. PSYCHOSOCIAL RISKS ////////// 10

7. ARTIFICIAL INTELLIGENCE (AI) //// 10

8. SANDBOXING ////////////////////////////////// 11

# THE ROLE OF OCCUPATIONAL SAFETY AND HEALTH (OSH) IN DIGITALISATION

While the concept of digitalisation is no longer new to policy makers, it continues its remarkable evolution throughout industry. Technological progress has considerable potential to improve OSH. In the Metal, Engineering and Technology-based (MET) industries, we have seen the automation of tasks which previously required physical labour or were performed in arduous conditions. The automation of these tasks has improved OSH and boosted productivity at production sites.

While MET employers are aware that digitalisation within industry plays a role in creating particular OSH challenges, the same holds true for the multitude of solutions it provides. Employers feel that the overall benefit of this evolution of industry far outweighs any possible known harm. MET employers are continuously working on minimising these challenges, many of which can be mitigated by having OSH taken into consideration at the beginning, and throughout the process, and not just as an afterthought. The perception of digitalisation must also be addressed. We must improve public acceptance and decrease workplace scepticism, ensuring employees are kept fully informed, with the aim of demystifying this evolution. Furthermore, we must ensure that a well-informed broader societal discourse can take place to address this issue appropriately.

## Technology and Pandemics

Digital technology already increasingly complements human labour in the workplace, but it is digital technologies such as mobile applications and sensors that have huge

potential to help in the fight against pandemics such as the COVID-19 crisis. It requires knowledge and awareness at the workplace to minimise the spread of the virus. Digital solutions are a key element of this.



## MESS SAFE

////

One of these digital technologies is an innovative solution for contact tracing and social distancing monitoring at the workplace called MESS SAFE. Using wearable technology developed by the Turkish Employers Association of Metal Industries (MESS), the solution aims to notify employees when they break social distance and allow management to monitor close interactions for COVID-19 risk analysis.

MESS SAFE: Innovative solution for social distancing



-  **Notification mechanism with sound, vibration and light**
-  **Contact tracing and reporting**
-  **Awareness for social distancing**

When employees wearing the device approach each other closely, the devices are activated and employees are notified with vibration, sound and light. Additionally, the devices



record the log of that interaction and upload it to the management panel through the cloud platform so that the appropriate person can take action.

MESS SAFE: How it works?



## Applications and Sensors

Governments have turned to digital technologies to tackle pandemics. Many EU Member States are using location tracking actions to slow the spread of viruses. Smartphone apps can help in the fight against pandemics in a variety of ways, not least via contact tracing and warning functionality. However, it is important to strike a balance between the benefit of obtaining this data, and ensuring full compliance with EU privacy and data protection legislation. Coordinated action at the European level is key to managing the spread of the virus.

The use of wearable sensors to ensure social distancing is one way in which digitalisation and the use of technology can help in the fight against a pandemic. Such technology can alert workers via warning signals if they come within the regulated distance of each other. This technology can also assist with contact tracing, as it can detail who the employee has been in contact with in the previous weeks and alert them directly.

## 1 Collaborative Robots (Cobots)

Until recently, many of the robots used in manufacturing were machines performing repetitive work, often used for tasks such as welding and assembly, and the interaction with the worker was limited. The increased use of cobots changes this dynamic. Cobots have been with us for some time and have presented some challenges. However new and improved cobots, using employee assistance systems which help in the decision-making process, are alleviating a lot of the challenges associated with this type of work. Increased versatility and dexterity of cobots have huge possibilities to improve OSH; as advancements in cobots continue so will the range of jobs they can complete. The scope of the use of cobots can range from simple support for the user to an almost complete automation of functions.

Standards will be of major importance for the use of cobots and international standards already exist for their safe use e.g. ANSI/RIA R15.06-2012. However, the definition of a cobot should be standardised.

Furthermore, we must explore how best to do risk assessment in relation to cobots. The correct training for their use is also key to mitigate any OSH challenges.

## 2 Flexible Working

### REMOTE AND MOBILE WORKING

Teleworking is a new reality for millions of Europeans which is used to cut the risk of contracting a virus. Indeed, digital solutions offer the possibility for the employer to manage staff and their work from a distance. However, this isn't something new to employers. The place where work is carried out has been one of the most visible results of increasing flexibility in organisations, and under normal circumstances these places are increasingly varied. Remote and mobile work provides the possibility for workers to spread their work, among other places, between business premises, customer's places of work, their homes or public transport. This



can be seen as one of the most important workplace innovations in Europe. As a result, workers are provided with the opportunity to have a better work life balance, allowing them to structure their professional and private lives in line with their own, and their employer's, needs.

## EVOLUTION\_OF\_OSH\_MANAGEMENT

It has been well documented that the application of traditional OSH practices to mobile working proves difficult. This can be down to a number of factors including excessive noise or poor posture which are variable and cannot be managed in a traditional way. Therefore, OSH management must evolve, for example by providing guidance to employees rather than trying to control all of the risks. Reducing possible OSH issues at an early stage is a good method to mitigate some of these challenges. The success rate depends on the level of planning and organisation by the company and if its workers understand and apply the new working methods, it must be done with due respect to the relevant legislation.

### 3 New forms of management

Digitalisation is changing the way of work as continued use is made of algorithmic decision-making and technology to monitor workers. Manufacturing employees can be healthier and safer and more independent due to wearables that provide feedback or monitor their health. It could be suggested that the possibility to have increased workforce tracking, for example through wearable devices for productivity purposes, could increase stress and other psychosocial risks.

However, there is also the possibility to monitor for those same psychosocial risks to ensure a healthier worker and by extension a healthier workplace. Adequate monitoring of workers can prevent these psychosocial risks before they occur. There are further opportunities to improve the OSH of workers in industry. Respecting applicable labour law and considering privacy aspects, the real-time data collected in relation to OSH exposures can go directly into an OSH management system which can help protect other workers doing a similar job.

### 4 Sensors & Smart Personal Protective Equipment (PPE)

Sensors have been used in industry for some time. However advances in these sensors are consistently occurring. For example, sensors inside machines can signal when there is a problem with a tool and tell the employee that it needs to be replaced. Smart PPE is crucial in mitigating some of the possible challenges associated with working in industry. This PPE can also provide the dual benefit of not only protecting employees but also training and correcting behaviour.



**5 Ergonomics & Exoskeletons**

The ergonomic benefits of digitalisation of industry are twofold. Firstly, in the past, as employees were doing most of the dexterous work, they would stay for a prolonged time in a fixed position, sedentary or otherwise. This could have led to musculoskeletal issues. As the dexterity of robots increased, the range of these jobs from which humans have been relieved has increased with it. Secondly, in an ageing society, it is imperative for companies, particularly SMEs, to keep their skilled workers as long as possible. Making sure that the physical burden is as low as possible will contribute to keeping their workers both at work and healthier longer, which provides an overall societal benefit.

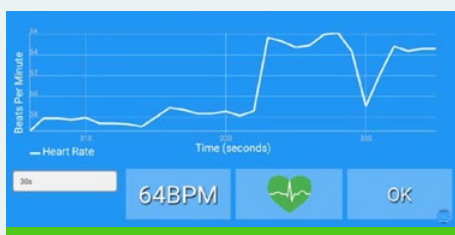
Advances in technology such as exoskeletons continue these trends. Devices worn on the body support workers carrying out manual handling tasks while reducing the load on the body. Furthermore, they can level the playing field in relation to the necessity to have physical strength, opening the door to a wider variety of employees.



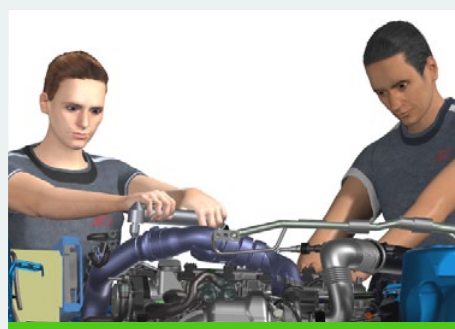
**SMART WORKWEAR - WEARABLE SOLUTIONS FOR RELIABLE REPORTING**



Work-related musculoskeletal disorders are prevalent in today's working population. The normal risk assessment process is usually performed via self-reports or observations, which can be of relatively low reliability. The KTH Royal Institute of Technology developed a state of the art technology using textile electrodes, sensors and inertial measurement units that can change that. Linked with the communication and processing capabilities of smart phones and tablets, they provide wearable solutions for automatic risk assessment within industry, with high reliability and resource efficiency.





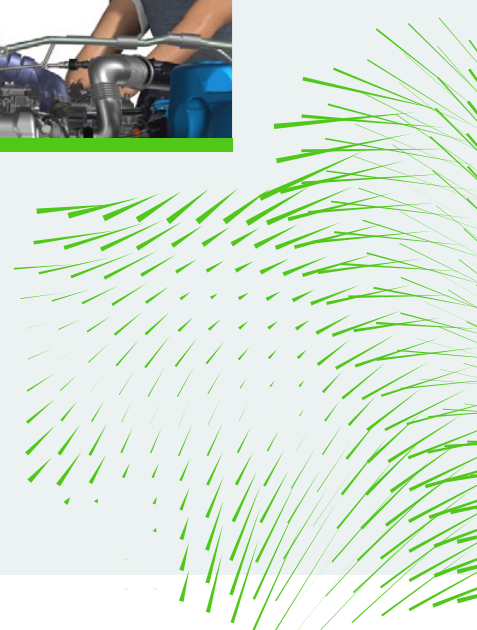


## INTELLIGENTLY MOVING MANIKINS – IMMA



Intelligently Moving Manikins (IMMA), a digital human modelling software, have been introduced into the production preparation process at the vehicle manufacturer Scania in order to develop better products and workplaces for its workforce. It endeavours to provide better ergonomics during the assembly process leading to improved quality and productivity, with reduced workplace injuries.

The IMMA software is considering human diversity and analyses the human movements. The human in the software is controlled via algorithms and always tries to move as ergonomically correct as possible. The ergonomic assessment can be presented with different scientific methods or own customized company standards. The use of digital human modelling software, to simulate humans at the assembly line production and evaluate assembly ergonomics, is ensuring efficient OSH design.



## 6 Psychosocial risks

The distribution of tasks could change in the future and this needs to be addressed in the context of psychosocial risks. Linked to this, human interface software should be designed in such a way as to avoid psychosocial risks. If we move to a system where we have more tutorials for how to interact with software, based on the examples of a video game tutorial, this could make it easier for employees to interact with machines. A digitalised workplace needs to strike the right balance, ensuring psychosocial well-being.



## 7 Artificial Intelligence (AI)

AI is an area of strategic importance which can bring solutions to many industrial OSH challenges. It is at the vanguard of innovation within our sector and holds massive potential to drive forward the digitalisation of industry. AI can provide a better model for OSH protection, and data derived from AI can help OSH professionals make better decisions, which is a further move toward evidence-based OSH and better protection for employees. This can also lend itself to better legislative decision making. When based on the most recent evidence, legislation can provide better protection for employees and a more proper response to the reality of the OSH situation at a production site.

However, we must find the right balance between regulation and innovation; if not, this could see Europe lagging behind more innovative economies. The current OSH legislative structures are fit for purpose when it comes to regulating the use of AI, it is a part of the overarching traditional risks which are found in industry. We must avoid to stifle innovation over concerns about the digitalisation of our world of work.



## 8 Sandboxing

There are many experiments ongoing on how AI and digitalisation are working; and these experiments are leading to concrete solutions in the workplace. These tests, which should allow companies to use new technologies while not creating unacceptable risks,

should be organised into legal or regulatory sandboxes. These agile policy-making solutions must be possible outside the current legal framework and should allow experimenting with AI solutions before they are placed on the market. Additional preconditions can, of course, be imposed but within themselves sandboxing exercises allow innovation while ensuring the protection of workers and citizens.



# 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 consultation and social dialogue.



/CEEMET



@CEEMET



WWW.CEEMET.ORG