HEALTH AND SAFETY AT WORK AND THE DIGITAL TRANSFORMATION: NEW SKILLS AND NEW TRAINING NEEDS
HEALTH AND SAFETY AT WORK AND THE DIGITAL TRANSFORMATION: NEW SKILLS AND NEW TRAINING NEEDS

- Changes in the World of Work
- Evolution of the Legislation
- Workers’ Well-Being
- ICT and Social Media in Workplaces
- Learning in Workplaces
- Assessment of the Impact on Workers: Tools and Surveys
- Future Landscapes
ICT & WORK: OPPORTUNITIES AND RISKS

DIGITAL AGENDA

EU-OSHA

ICT

Digital Growth

Research Priority 2013-2020

- Musculoskeletal disorders, workstation ergonomics
- Exposure to electromagnetic fields
- Psychosocial risks, stress symptoms, online privacy, monitoring, discrimination, violence and cyberbullying, blurring of work/private life boundaries
- Digital èlite, Digital divide
- Cyber addiction
- Deskilling

- Business and productivity
- Automation of processes
- Company organization
- The well-being of workers
- Work-life balance
- KET’s, sensors, smart PPE

HEALTH AND SAFETY AT WORK AND THE DIGITAL TRANSFORMATION: NEW SKILLS AND NEW TRAINING NEEDS

29/11/2019
## ICT AND NEW RISK FACTORS

### ICT AND NEW RISK FACTORS

### DIVERSIFICATION IN USE IN LIFE AND WORKING LIFE

Many studies have shown a relationship between excessive use of ICT and high levels of anxiety, depression and stress, with repercussions also on the motivation to use them. The diversification of different generations in the workforce underlines this phenomenon. Multigenerational and multicultural workforce

### DIGITAL DIVIDE AND DIGITAL ÉLITE

In the workplace there is a growing demand for advanced skills. This implies greater employability only for those who achieve these skills. In this case, learning and training play an important role both in formal and informal context.

### DIGITAL AMNESIA

It refers to the experience of forgetting information entrusted to an electronic device that stores and remembers it instead of the user. The phenomenon has also been found in the workplaces pointing out that while automation can be a support for the workers in the management of information, on the other hand, it may pose risks to organizations in terms of IT security and a real understanding of shared information. For OSH sector, in particular, it will conduct also to the loss of Corporate memory.

### CYBER-ADDICTION

Digital technologies allow workers to be always on, however the possibility of being connected can have negative consequences in terms of dependency. In Italy, this phenomenon is more widespread in the age group of 30 (37%) than in the age group of teenagers (35%), as it occurs in the rest of the world.

(Source: E. Pietrafesa, S. Stabile, R. Bentivenga, *ICT e piattaforme social e di collaborazione sul lavoro*, INAIL, 2017)
DIGITAL TRANSFORMATION IN THE WORLD OF WORK

https://www.youtube.com/watch?v=HF-a-UmoRt4
EVOLUTION OF THE WORK

ICT and digitization as drivers of change
EVOLUTION OF WORK: NEW WAYS OF WORKING

COWORKING

HEALTH AND SAFETY AT WORK AND THE DIGITAL TRANSFORMATION: NEW SKILLS AND NEW TRAINING NEEDS
DIGITAL TRANSFORMATION IN ORGANIZATIONS: THE IMPACT ON WORKING LIFE QUALITY AND NEW RISK FACTORS
EU28: Employees in specific occupations by type of digital skills (basic, advanced and specialized)
% of total employees in specific occupational category

Source: ICT for work. Digital skills in the workplace, European Commission, 2016
AUTOMATION AND AI WILL ACCELERATE THE SHIFT IN SKILLS THAT WORKFORCE NEEDS

**Table: Changes in Hours Worked by 2030**

<table>
<thead>
<tr>
<th>Skills</th>
<th>United States, all sectors</th>
<th>Western Europe, all sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical and manual skills</td>
<td>90 (Billion) -11 %</td>
<td>113 (Billion) -16 %</td>
</tr>
<tr>
<td>Basic cognitive skills</td>
<td>53 (Billion) -14 %</td>
<td>62 (Billion) -17 %</td>
</tr>
<tr>
<td>Higher cognitive skills</td>
<td>62 (Billion) -9 %</td>
<td>78 (Billion) -7 %</td>
</tr>
<tr>
<td>Social and emotional skills</td>
<td>52 (Billion) +26 %</td>
<td>67 (Billion) +22 %</td>
</tr>
<tr>
<td>Technological skills</td>
<td>31 (Billion) +60 %</td>
<td>42 (Billion) +52 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>287</td>
<td>363</td>
</tr>
</tbody>
</table>

**Note:** Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Numbers may not sum due to rounding.

**Source:** McKinsey Global Institute workforce skills model; McKinsey Global Institute analysis.
### Table 4: Comparing skills demand, 2018 vs. 2022, top ten

<table>
<thead>
<tr>
<th>Today, 2018</th>
<th>Trending, 2022</th>
<th>Declining, 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical thinking and innovation</td>
<td>Analytical thinking and innovation</td>
<td>Manual dexterity, endurance and precision</td>
</tr>
<tr>
<td>Complex problem-solving</td>
<td>Active learning and learning strategies</td>
<td>Memory, verbal, auditory and spatial abilities</td>
</tr>
<tr>
<td>Critical thinking and analysis</td>
<td>Creativity, originality and initiative</td>
<td>Management of financial, material resources</td>
</tr>
<tr>
<td>Active learning and learning strategies</td>
<td>Technology design and programming</td>
<td>Technology installation and maintenance</td>
</tr>
<tr>
<td>Creativity, originality and initiative</td>
<td>Critical thinking and analysis</td>
<td>Reading, writing, math and active listening</td>
</tr>
<tr>
<td>Attention to detail, trustworthiness</td>
<td>Complex problem-solving</td>
<td>Management of personnel</td>
</tr>
<tr>
<td>Emotional intelligence</td>
<td>Leadership and social influence</td>
<td>Quality control and safety awareness</td>
</tr>
<tr>
<td>Reasoning, problem-solving and ideation</td>
<td>Emotional intelligence</td>
<td>Coordination and time management</td>
</tr>
<tr>
<td>Leadership and social influence</td>
<td>Reasoning, problem-solving and ideation</td>
<td>Visual, auditory and speech abilities</td>
</tr>
<tr>
<td>Coordination and time management</td>
<td>Systems analysis and evaluation</td>
<td>Technology use, monitoring and control</td>
</tr>
</tbody>
</table>

**Source:** Future of Jobs Survey 2018, World Economic Forum.
WHICH TYPE OF PROFESSIONS ARE MOST VULNERABLE TO AUTOMATION?

Threats should be assessed along two dimensions: How replaceable are the core skill sets? And how much of a shift is there in the way value is delivered?

**Degree of threat to: Core skill set**

**Deconstructed Jobs**
Skills remain safe, but form of value delivery is shifting.
- College professor
- Photographer
- Livery driver

**Displaced Jobs**
Skills are deemed obsolete, and form of value delivery is irreversibly altered.
- Toll taker
- Pharmacist
- Librarian

**Durable Jobs**
Both skills and form of value delivery are too difficult or costly to automate.
- Physician assistant
- Electrician
- Plumber

**Disrupted Jobs**
Skills are highly standardized, but consumers still like the way value is delivered.
- Bricklayer
- Accountant
- Fast food server
- Real estate agent

Source: Four Ways Jobs Will Respond to Automation, MIT Sloan ICT for work. Digital Management Review, 2018
ICT AND IMPLICATIONS FOR OSH: SKILLS, KNOWLEDGE AND INFORMATION REQUIREMENTS

NEW SKILLS AND TRAINING NEEDS

Less academic and more fact-based learning mode across multiple disciplines, development of interpersonal skills suitable for collaborating virtually

LIFELONG LEARNING

Short-term and high-value skills, workers must be able to learn quickly, continuously and then learn again and again, cause workers may find themselves doing a job that did not exist when they were students

SELF-DIRECTED ONLINE LEARNING

Allow workers to adapt learning to their needs, choose how to use it, using the most appropriate time and at their own pace

KNOWLEDGE TRANSFER

Addiction to technology can lead to a loss of social skills with a negative impact on social interactions and knowledge transfer among workers

DE-SKILLING

Over time workers skills became unused out of date (lack of skilled workers experience), and with automation and lower levels of competence, workers could be less and less able to solve problems and make decisions independently

CORPORATE MEMORY

Big leakage of the workforce and loss of corporate culture and memory particularly in OSH matters

Source: Foresight on new and emerging occupational safety and health risks associated with digitalisation by 2025, EU-OSHA 2018

29/11/2019
Read back the training phases: needs analysis - planning - delivery - evaluation

Indications reported in the agreements and rules

Quality criteria in OSH training: adequacy
• specificity
• continuity
• understandability
• usability
• etc

ICT and Learning:
• customization
• interactivity
• modularity
• usability
• accessibility
• sharing
• etc

BOUND
OPPORTUNITY
INNOVATION IN THE LEARNING PROCESS

- BIG/OPEN DATA
- ANYWHERE
- ALWAYS ON
- SKILLS/EXPERTISE
- ON DEMAND
- ENGAGEMENT

ICT AND LEARNING

COLLABORATION

DIGITAL TRANSFORMATION IN ORGANIZATIONS: THE IMPACT ON WORKING LIFE QUALITY AND NEW RISK FACTORS

INNOVATION IN THE LEARNING PROCESS

ON DEMAND
Italy is more exposed to the risks of the digital transformation than it reaps the benefits, relative to other OECD countries:

- **Internet use** and the variety of activities that people use the Internet for is low compared to other countries, the **level of inequality of uses** of the Internet is among the highest of OECD countries;

- People in Italy have benefited a fair amount from lower extended job strain due to computer-based jobs, but information industries contribute relatively little to overall employment;

- **An estimated 15% of jobs are at high risk of automation**, which is above the OECD average;

- Italy is exposed to a few other key risks of the digital transformation, most notably a widely reported **lack of ICT skills** among teachers, with 36% of teachers indicating a high need to develop their ICT skills.

Source: *How’s Life in the digital Age? OECD, 2019*
**FUTURE PERSPECTIVES**

- Adaptation of training paths to the needs of the labor market with the integration of plurality of training methodologies in a lifelong learning perspective to enhance the knowledge of the individual, not only the formal ones, but also informal.

- Contextualization of the innovations brought by technologies for learning: serious play, gamification, informal learning, Massive Open Online Courses, Augmented Reality and Virtual Reality, Immersive Reality, etc.

- Guarantee the quality criteria required from the legislation.

- Respect of the criteria of personalization, interactivity, flexibility and reusability adapting the systems of recognition and certification of competences to the needs of constantly evolving competences.

Source: OECD Skills Outlook 2019: Thriving in a Digital World
Many thanks for your attention

e.pietrafesa@inail.it

@epietrafesa