



Looking forward to the future forms of work: Anticipating new and emerging risks

International conference

“Occupational Safety and Health in the Changing World of Work”

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Brdo, 16 June 2017





VSE AVTORSKE PRAVICE SO PRIDRŽANE.

**GRADIVA NI DOVOLJENO RAZMNOŽEVATI ALI
RAZPOŠILJATI V KAKRŠNIKOLI OBLIKI
BREZ PREDHODNEGA PISNEGA
DOVOLJENJA AVTORICE IN MINISTRSTVA ZA DELO,
DRUŽINO, SOCIALNE ZADEVE IN ENAKE MOŽNOSTI.**

European Agency for Safety and Health at Work (EU-OSHA)

The European Union body responsible for the collection, analysis and dissemination of relevant information to serve the needs of those involved in safety and health at work



In Bilbao (Spain), since 1996

Anticipating new and emerging OSH challenges

Background to EU-OSHA's work:

- **A mandate from the Community Strategies for OSH since 2002**
- **EU Strategic Framework on Health and Safety at Work 2014-2020**
 - Calls on EU-OSHA to “Anticipate possible negative effects of new technologies and changes in work organisation on workers' health and safety”
- **A priority in EU-OSHA's Multi-annual Strategic Programme 2014-2020**

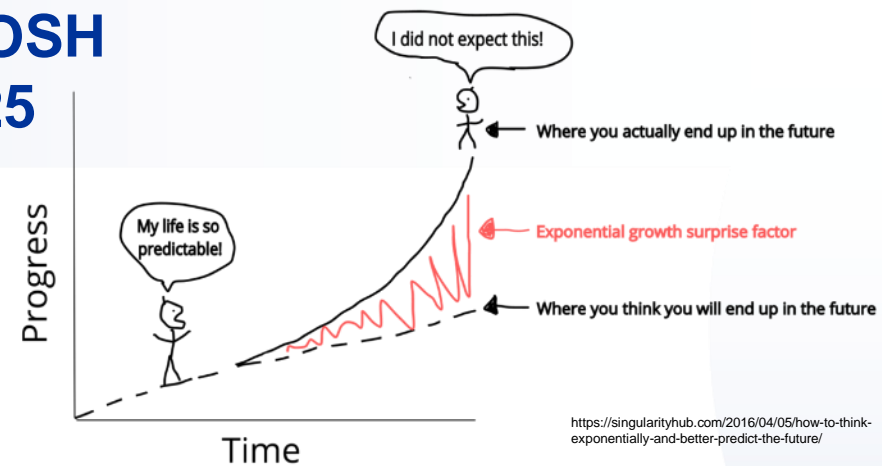
EU-OSHA's work on Future forms of work and OSH

- **Foresight on new and emerging OSH risks associated with ICT by 2025**
 - Link to the development of the EU Digital Single Market, a priority of the EU Commission
- **Review of policy development in the EU linked to new forms of work intermediated by digital platforms and expected impact on OSH**
- **Series of Expert Articles on “The future of work”**
 - ***Crowdsourcing***, Prof. Huws, University of Hertfordshire, UK (2015)
 - ***Robotics***, Dr. Adj.Prof. Kaivooja, University of Turku, FI (2015)
 - ***Performance-enhancing drugs***, Prof. Bloomfield & Dr. Dale, Lancaster University, UK (2015)
 - ***Additive manufacturing***, J. Junte, Journalist, NL (*in progress*)
 - ***Monitoring of workers***, E. van den Broek, Utrecht University, NL (*in progress*)
 - ***The future of the (e-)retail sector***, L. Carter, HSL, UK (*in progress*)

Available at: https://oshwiki.eu/wiki/Category:Identifying_new_and_emerging_risks

Foresight on new and emerging OSH risks associated with ICTs by 2025

Method: Scenario-building



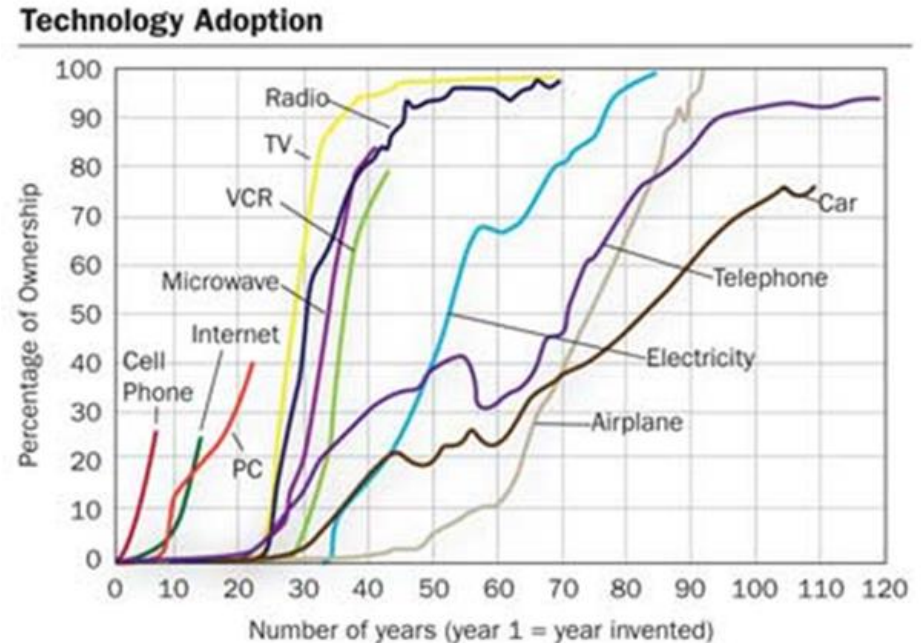
- **A tool for strategic futures thinking**
 - Doesn't assume the future is pre-determined, doesn't demand consensus
 - To provide insight and stimulate debate into ways to shape the future
- **Scenarios of plausible, possible futures:**
 - Help policy-makers gain insights into long-term developments
 - Better understand what decisions could help avoid/ encourage these futures
- **Participatory:**
 - EU-OSHA's stakeholders/policy-makers actively involved
 - Interviews and workshops with multi-disciplinary experts and policy-makers
- **Multidisciplinary**
 - Societal, technological, economical, political context are taken into account

Foresight on new and emerging OSH risks associated with ICTs by 2025

Technologies are diffusing much faster than in the past

- 119 years for the spindle to spread beyond Europe
- Time taken to reach 50 m users
 - Telephone 75 y
 - Radio 38 y
 - TV 13 y
 - Internet 4 y
 - Facebook 3.5 y
 - Angry Birds app 35 days

Source: Citi Digital Strategy Team



Source: Forbes Magazine

ICT is a driver of workplace change

■ ICT influences:

- What jobs there are
- What tasks humans will do
- The sectors and industries people will work in
- How people perceive work

■ New occupations and industries

- eBay, Facebook, You-tube barely existed 10 years ago, now global corporations
- Since the PC invention, over 1,500 new job titles in occupational classifications
 - E.g. Database administrator, Web Designer, Cyber-security
- 65% of children entering primary school will end up working in new jobs that don't yet exist

(Research from the World Economic Forum)

TECHNOLOGICAL drivers

Robotics and Collaborative robots	Additive manufacturing (3D, 4D and bio-printing)
Artificial intelligence (AI)	Advanced materials
Internet of things	Augmented reality (AR)
Big Data	Virtual reality (VR)
Mobile devices and communication networks	Miniaturisation and Wearables
Cloud computing	Bionics
Autonomous vehicles	Direct brain to computer
Drones	Cybersecurity

This clothes-folding robot is two months away from its planned launch.

CES 2017: Clothes-folding Laundroid robot readies for launch
 6 January 2017 Last updated at 03:40 GMT
 A clothes-folding robot that has been in development for more than a decade is about to

Smartwatches know you're getting a cold days before you feel ill
 DAILY NEWS 12 January 2017

CES 2017: Ford sticks to self-driving cars by 2021 pledge
 7 January 2017 Last updated at 00:21 GMT
 Ford insists it will have fully autonomous cars, without steering wheels or brake pedals, on the roads by 2021

We will soon be able to read minds and share our thoughts
 NEXT YEAR PREVIEW 14 December 2016
 Advertisement: Set up your auto enrolment pension scheme with NEST. It feels good. Find out more

Smart buildings predict when critical systems are about to fail
 DAILY NEWS 10 January 2017

Augmented reality set to overtake VR as new apps go live
 NEXT YEAR PREVIEW 14 December 2016
 Advertisement: Microsoft Cloud

SOCIETAL drivers

- **Workforce demographics**
 - Shortage of an active workforce in the EU, generational differences
 - Diverse workforce
- **Inequality and polarisation**
- **ICT knowledge and skills**
 - Gaps in specific ICT skills
 - Quickening of knowledge transfer and of knowledge obsolescence
- **Online environment and attitudes**
 - Public attitudes towards ICT development and ethics, on-line privacy
 - Violence and bullying
- **New working patterns - and their regulation (?)**
 - Flexible working patterns, virtual workplaces, crowd-working
 - Changes to HR management

ECONOMIC drivers

■ Economic environment

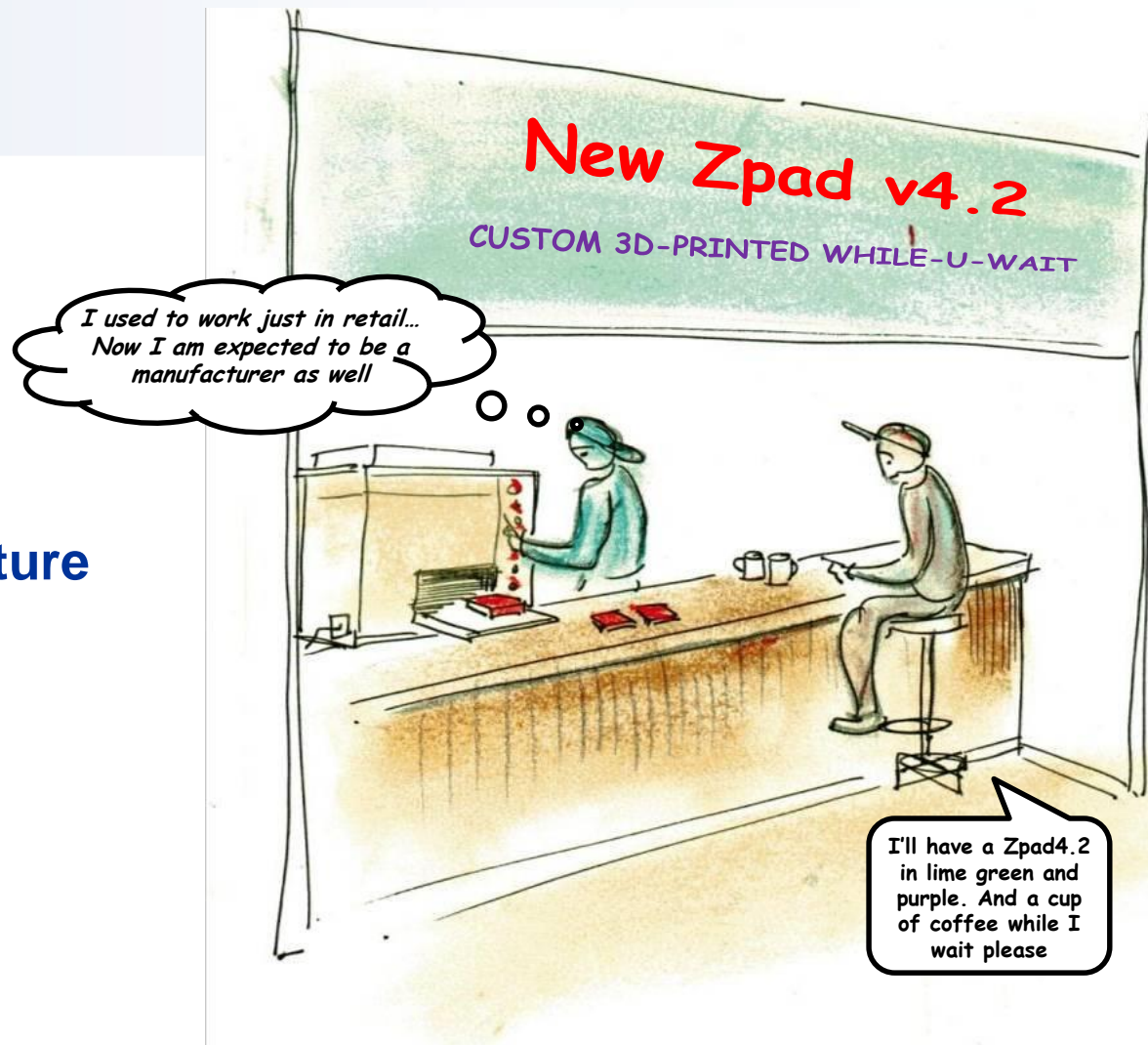
- Globalisation and EU economy
- Re-shoring manufacturing vs. Offshoring of knowledge work

■ Changing industry structure

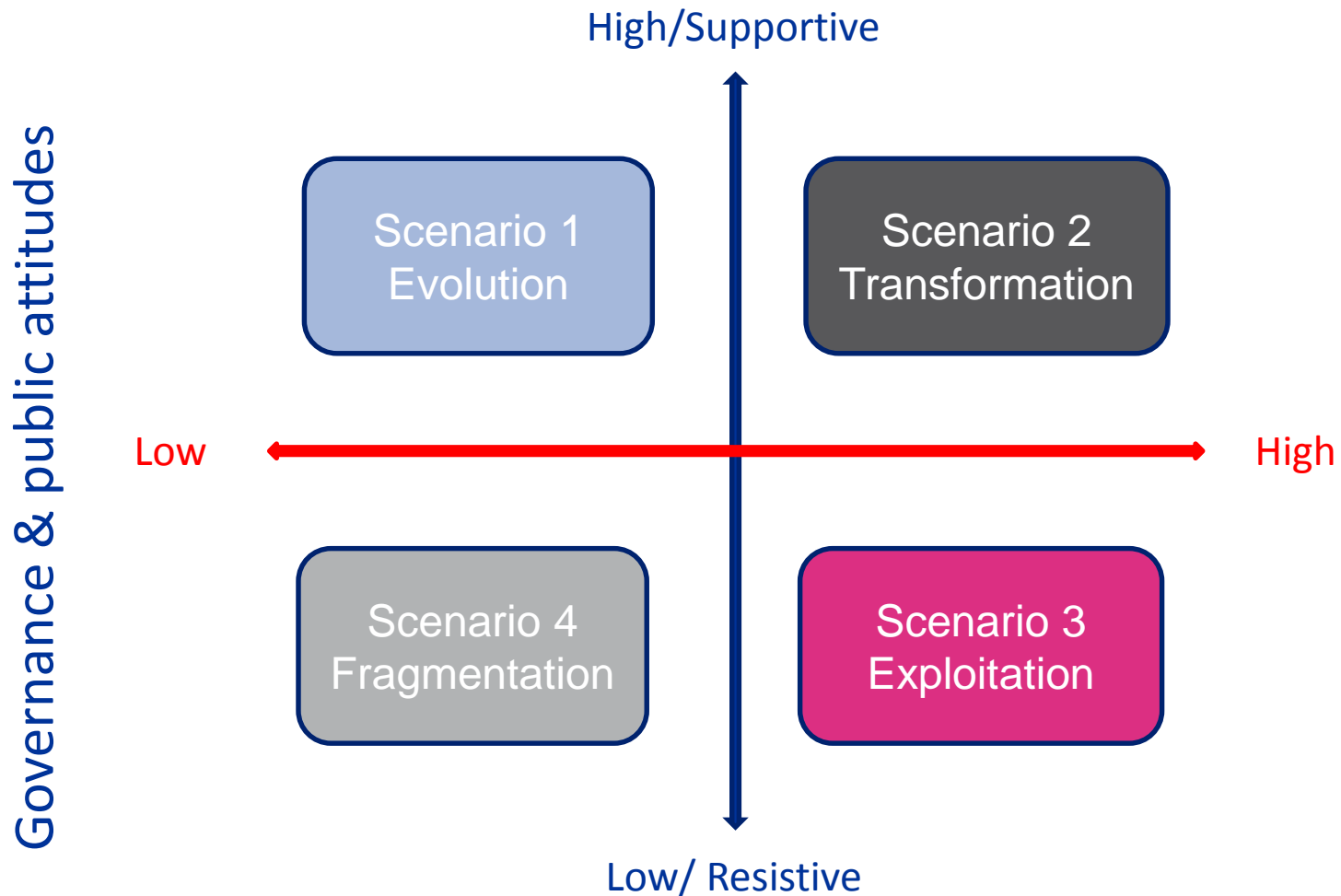
- Increase in Micro and SMEs
- Rise of the entrepreneur
- Effect of ICT on other sectors
- Alternative distribution chains
- Sharing economy

■ Data-enabled economy

- Economic value of data
- Knowledge economy



Four future scenarios



Economic growth and technology innovation

Future forms of work: Opportunities for OSH

■ Robotics:

- Removes workers from hazardous jobs:
 - Maintenance, logistics etc.
 - Drones to avoid work at height or in confined spaces
- Improves quality of work - automating monotonous/repetitive jobs
- Human-enhancement technologies - exoskeletons



■ Digitalisation:

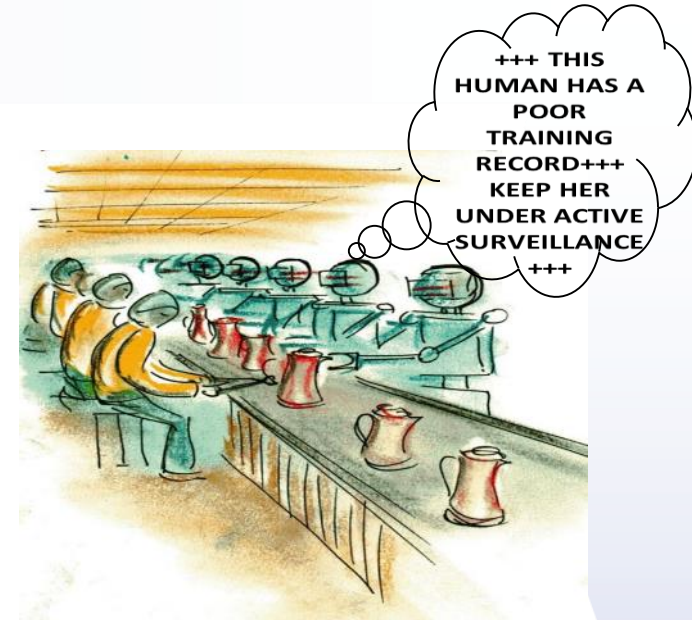
- New opportunities for work-life balance
- Access to work for a diverse workforce
- New opportunities for OSH communication
 - sharing OSH information, providing OSH online training (e.g. massive open online courses, use of social media)



OSH Challenges

Working with robots and Artificial Intelligence

- **Ergonomic and safety of Human-Machine Interfaces**
- **Increasing “technological” complexity**
 - Too much trust in the infallibility of technology
 - Lack of understanding of the underlying processes
- **De-skilling of work**
- **Pressures to perform - at the same level as robots?**
- **Team organisation**
 - Who does what, the robot or the worker?
 - Can/will a worker take instructions from a robot-boss?
- **“Peers” are robots –social support**
- **Electromagnetic fields?**



OSH Challenges

Digital work and the 24/7 global economy

▪ **Ergonomic risks**

- Intensive use of ICT on devices/ environments not ergonomically designed for (intense) work, Static work

▪ **Available all the time, including at unsocial times**

- Blurring of boundaries work-life balance
- Work intensity - Interruptions and unpredictability of demand at short notice
- Dependence to technology and “Fear Of Missing Out” syndrome
- Constant pressure for competitive self-promotion on the web

▪ **Virtualisation of work relationships, feeling of isolation**

▪ **What and how are data collected, shared and used?**

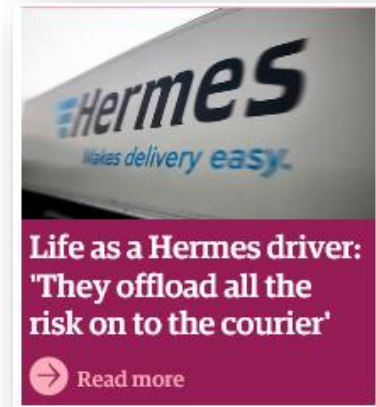
- Big Data: only today 2.5 quintillion bytes of data will be generated

The image shows a screenshot of a news article snippet. The main headline reads: "Your boss is watching you: Companies fit staff with tracking devices to they can follow their movements night and day". Below the headline, there are two bullet points: "• The credit card-sized devices created by Hun" and "• They analyse sleep and speech patterns, scan for proximity to others and measure physical activity of the wearer". To the right of the headline, there are social media sharing options for Facebook (Like Daily Mail) and Pinterest (Follow Daily Mail). Below the sharing options, there is a "DON'T MISS" section with a sub-headline: "The Inbetween stars Joe Thoma Hannah Tointon : 'engaged after se'". At the bottom of the snippet, there is a "SHARE SELECTION" button with icons for Facebook, Twitter, and Email, followed by the text "the world".

OSH Challenges

Digital work and the 24/7 global economy

- **‘Gig economy’, ‘platform workers’, ‘zero hours’**
 - Fragmented, dispersed and diverse workforce
 - Multiple jobs – at least 1 in 3 are ‘independent workers’ out of necessity, not choice
 - Unclear status and responsibilities
 - Evaluation of worker’s performance and payment – clear?
 - New forms of employment fall out of the scope of the OSH legislation
 - OSH monitoring systems have not been adapted
 - Lack of data and statistics about workers in new generation jobs
 - Race to the bottom of working conditions and OSH
 - Undercutting of “good employers”



Thank you!

More information in 25 languages



<http://osha.europa.eu>