



Bundesanstalt für Arbeitsschutz und Arbeitsmedizin

**Working in the Digital World –
Focus: Human Being**

Nancy 2017

About BAuA: Facts and Figures

- Federal Institute for Occupational Safety and Health (BAuA), directly subordinated to the German Federal Ministry of Labour and Social Affairs
- Locations in Dortmund, Berlin, Dresden and Chemnitz
- Total Budget: 70,3 m€ (2017)
- More than 700 employees, therefrom 120 researcher
- Own research and development laboratories



Research focus in the long run

- **Work-related diseases** and their **multifactoral genesis** of e.g. work-related disorders of the **musculo-skeletal and cardio-vascular systems**
- **Mental workload** against the background of **new types of work.**
- the effects of **new technologies on health and safety at work** e.g. nanotechnology and new information and communication technologies like new types of man-machine-interactions.

Theses:

Working in the Digital World comes along with...



...higher Flexibility of **Working Time and Working Place**

...increasing Use of **Innovative and Digital Technologies**

...**Challenges** regarding **Physical and Mental Health** of workers

In former times: Clear distinction

Working Time

Rest Period

...melting borders

Working Time

Rest Period

Working time and rest period

Working Time

Rest Period

Long Working Hours

Work-Life-Balance

Pauses

Mobility

Shift Work

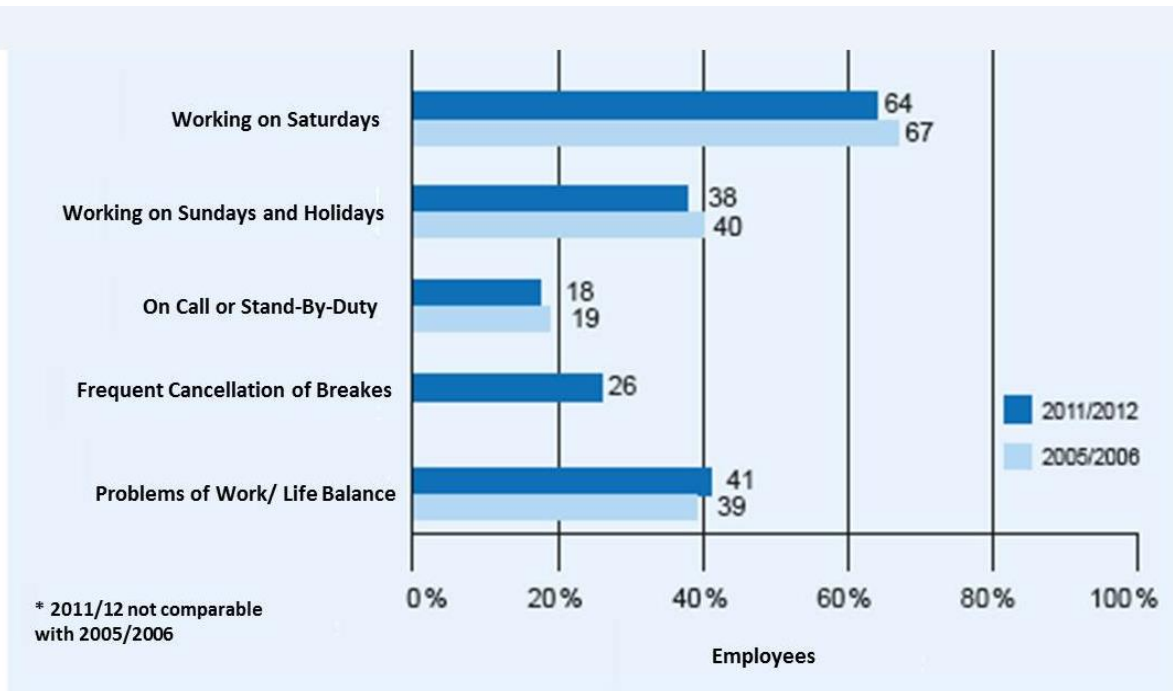
On-call Work / Duty

Working on Weekends

Detachment

Flexible Time

Facts and figures: What statistics tell us...



(17562<n<17767)

- 2 of 3 persons work as well Saturdays
- About one quarter of the interviewees disclaim regular pauses (due to working issues)
- Atypical working times belong to the every day business of employees, however this increased only slightly
- 2 of 5 Personen frequently have problems to combine working and private life.

Source: Stressreport 2012

To sum up: Working Time and Working Place

- Working in the digital world contributes to further increase the transition to flexible working hours and places. At the same time also the intensification of work further increases.
- An increase in longer and more flexible working times, mobility requirements and prolonged availability is expected.
- At the same time it is observed that pauses are dispensed in case of high working intensity.
- Detachment as well as work-life balance are getting more and more complicated due to these developments.

What are the effects?

In our project „Mental Health in the World of Work“ we analyzed the effects of working time on mental health:

- A good design of working time is linked up with better mental health
- Further links arise from recreation within as well as beyond working time
- Scheduling, controlling and predicting requirements of work becomes more and more important
- Generally significant links to other working condition factors exist. Especially to the factors work intensity, work tasks and leadership

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Research in the context of Ambient Intelligence and Industry 4.0

Chances ?
Risks ?



Smart factory



Smart office



Wearable IT



Bildquellen: Fraunhofer IAO
Daimler AG

Working in the Digital World means...

- ...working with machines and equipment provided with Information- and Communication Technology (ICT)
 - to communicate with each other and the environment (-> Internet of Things, Ambient Intelligence; Ubiquitous Computing)
 - configure itself and save information
 - are decentrally organised by themselves

BASIS: RFID, sensors and actors with intelligent components

- Multimodal human-machine-interface (touchdisplay; voice and gesture control)
- Merging of real (physical) and virtual world (Cyber): Cyber-Physical Systems (CPS)



It is important to recognize that the aim is to optimize the work system and not to reduce stress

Theses:

Working in the Digital World comes along with...

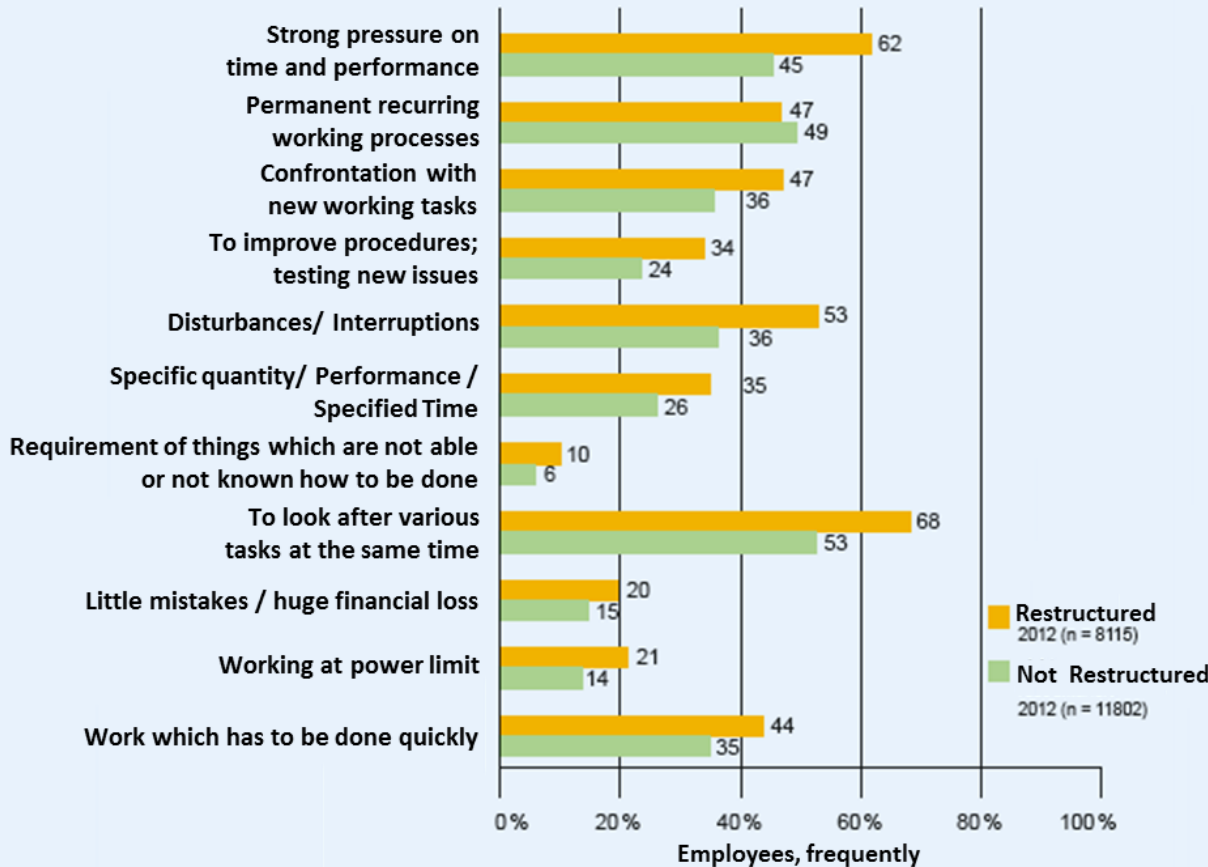


...higher Flexibility of Working Time and Working Place

...increasing Use of Innovative and Digital Technologies

...**Challenges** regarding **Physical and Mental Health** of workers

Facts and figures: What statistics tell us...



- Differences in reorganised and non-organised enterprises are particularly obvious regarding „strong pressure on time and performance“;
- „Disturbances/ Interruptions“ as well as „to look after various tasks at the same time“.

Preservation and Promotion of Physical and Mental Health and Capability

Key Issues in the Digital World	BAuA's Mission
<ul style="list-style-type: none"> ✓ Possible Reduction of Physical Work Load ✓ Repetitive and Deskilling Work ✓ Increasing Physical Inactivity 	<ul style="list-style-type: none"> ✓ Developing Measures to Evaluate Repetitive Working Processes ✓ To evaluate and to Improve Measures Aiming at Raising Activity
<ul style="list-style-type: none"> ✓ Growing Information Flood ✓ Unpredicted Work Tasks ✓ Working Interruptions, ✓ Time Pressure and Pressure to Perform 	<ul style="list-style-type: none"> ✓ To Close the Lack of Knowledge how such Working Condition Factors affect Mental Health ✓ Identify effective Ways of Work Design
<ul style="list-style-type: none"> ✓ New digital Technologies require new Cognitive Abilities 	<ul style="list-style-type: none"> ✓ To look for Factors who might influence Cognitive Abilities in a Positive Way.

Thank you very much for your attention!

