



European Foundation
for the Improvement
of Living and Working
Conditions

The tripartite EU Agency providing knowledge
to assist in the development of better social,
employment and work-related policies

Sustainable work: New Technologies and the Manufacturing sector

The Nordic Approach to Sustainable Work

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Outline

- Sustainable work – definition and components
- Digitalisation and working conditions
- The case of manufacturing

Sustainable work over the life course means

*Working and living conditions are such that they **support** people in engaging and remaining in work throughout an extended working life*

Macro-level: economic & societal context

Policies, regulations, infrastructures, practices

Meso-level: work context (incl. policies & practices)

Quality of work

Work-life balance

Quality of life

Micro-level: Individual context

Sustainable work outcomes during the life course:

Macro level

Individual level

TIME ➡ ➡ ➡ Accumulation of exposures over the life course ➡ ➡ ➡

Economic & societal context: Labour productivity, Income quintile share ratio, GDP per capita, GDP growth, Unemployment, Young people aged 15-24 neither in employment nor in education and training (NEET)

Macro-level practices, policies, regulations:

Expenditure on social protection and health, Access to health care, Access to child care, Labour market policies, Representation, Pension policies

Meso-level: Work context

Share of managers/professionals, Share of self-employed, Decreased number of employees and restructurings at workplace, Commuting time, Division of labour force by sector (% working in agriculture, industry, construction, commerce and hospitality, transport, financial services, public administration and defense, education, health, other services)

Meso-level practices: Social environment, Work accommodation practices, Employee involvement practices, Conflicts solved in a fair way

Quality of work: Skills and discretion, Work intensity, Working time quality, Prospects, Monthly earnings, Gross wage, Physical work environment

Work-life balance: Balance of working hours to family/social commitments, Flexibility in working hours, Share of population not working due to caring responsibilities

Quality of life: Health and wellbeing, Income and poverty

Individual context: Share of +50 year old people, share of single people and mean household size, people with more than one job, needs for further training

Transitions: Part time—Full time work, Fixed term—Permanent job contract, Unemployment—Employment, Increased income or salary

Sustainable work outcomes

Society:

Employment rate among people aged +55,
Duration of working life

Individual:

Work engagement,
Gap between actual and preferred retirement age,
Share of no sickness absence,
Share reporting negative effects of work on health



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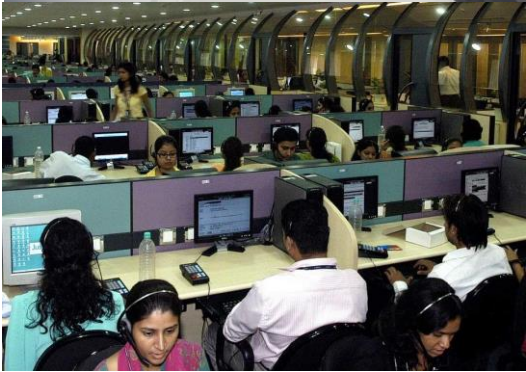
What does digitalisation mean for SW?

Digitalisation: Three vectors of change

- Automation of work
- Digitalisation of processes
- Coordination by platforms



Digital impact on working conditions



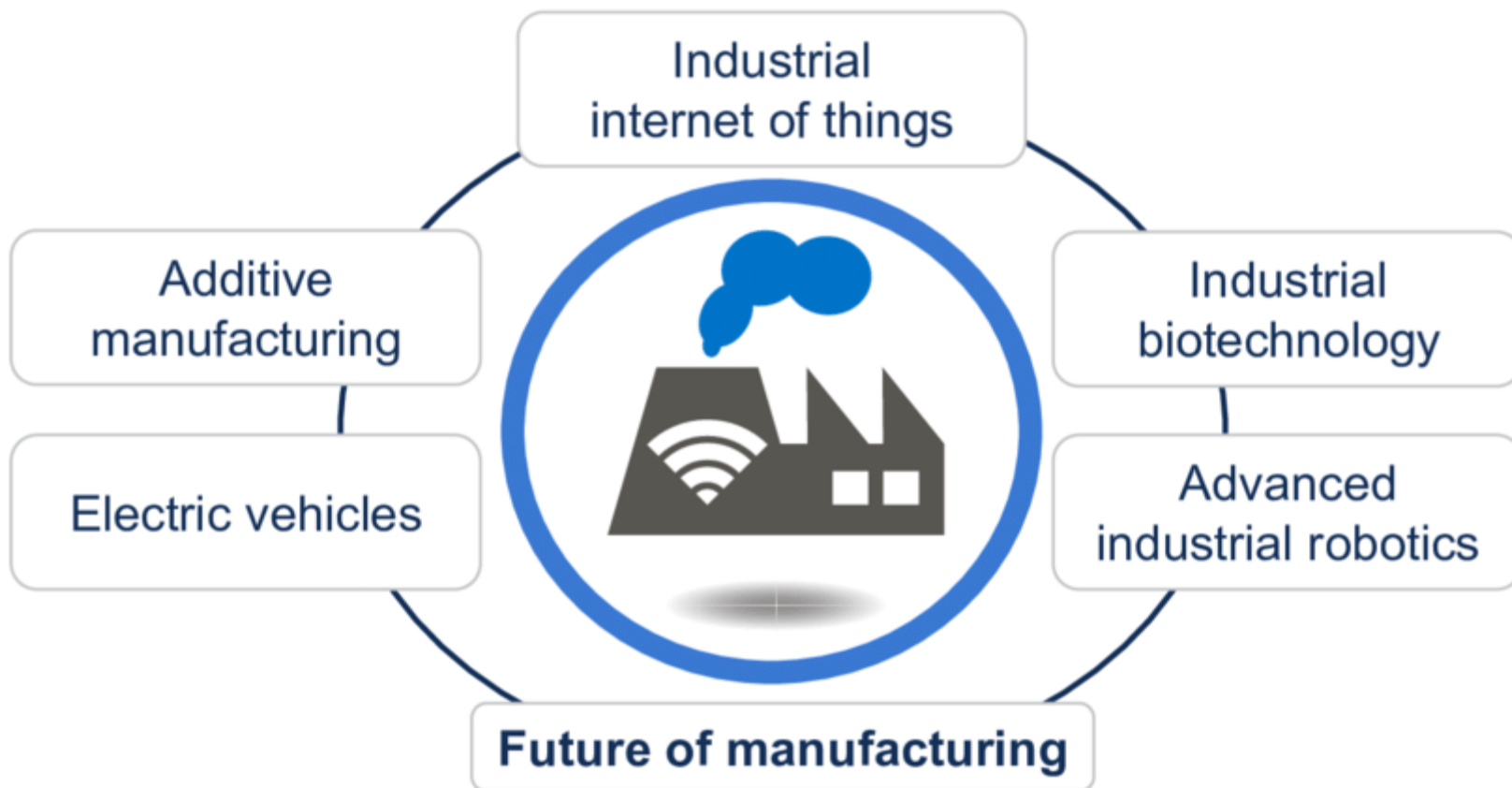


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Manufacturing sector

Manufacturing: Game-changing techs



Potential impacts

- Diminution of traditional industrial risks but also new and **emergings risks**
- Robots taking over **hazarduous jobs**, handling of hazardous materials, operating in dangerous environments
- Human error stays an element in human-robot interaction
- High priority of **training and recruitment of data security experts** (IIoT, AIR) – vulnerability of network data systems
- Psychological effects (machine control of work processes)
- Digital panopticum (**intrusive monitoring** of workers)
- Flexible working time arrangements (**location-independent work**)

Occupations: Job Quality implications

- 5 Occupations explored:
 - Care assembler
 - Meat processing worker
 - Chemical product plant and machine operator
 - Hand-packer
 - Inspection engineer

- Job dimensions explored:
 - Intrinsic job quality (autonomy, skills, social support)
 - Employment quality
 - Workplace risks
 - Working time and work-life balance
 - Wages

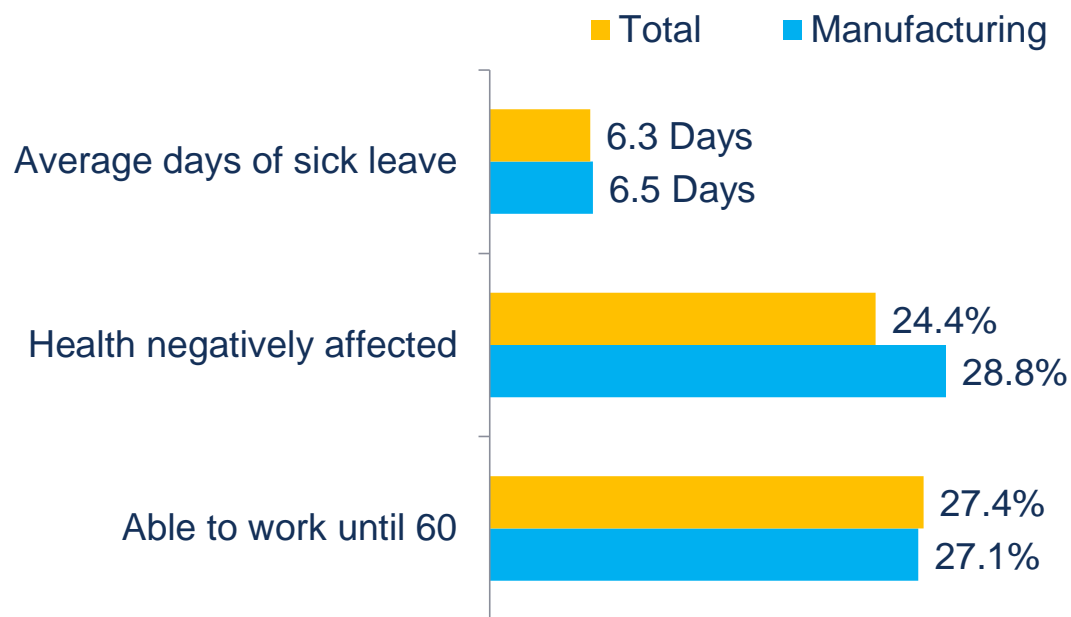
Findings I

- Context matters for understanding the impact of technological change
- Car assemblers
 - intellectual tasks increased
 - Improvements in intrinsic JQ (more team work)
- Meat processor:
 - Still very labour-intensive / less automation (costs, tech. challenges)
 - Increasing standardisation => greater QC
 - Individual, less autonomous work
- Chemical product plant and machine operator
 - Decreasing labour intensity in production
 - Improved working and safety conditions
 - Increase in job variety, more autonomy
 - ICT skills are required of plant operators

Findings II

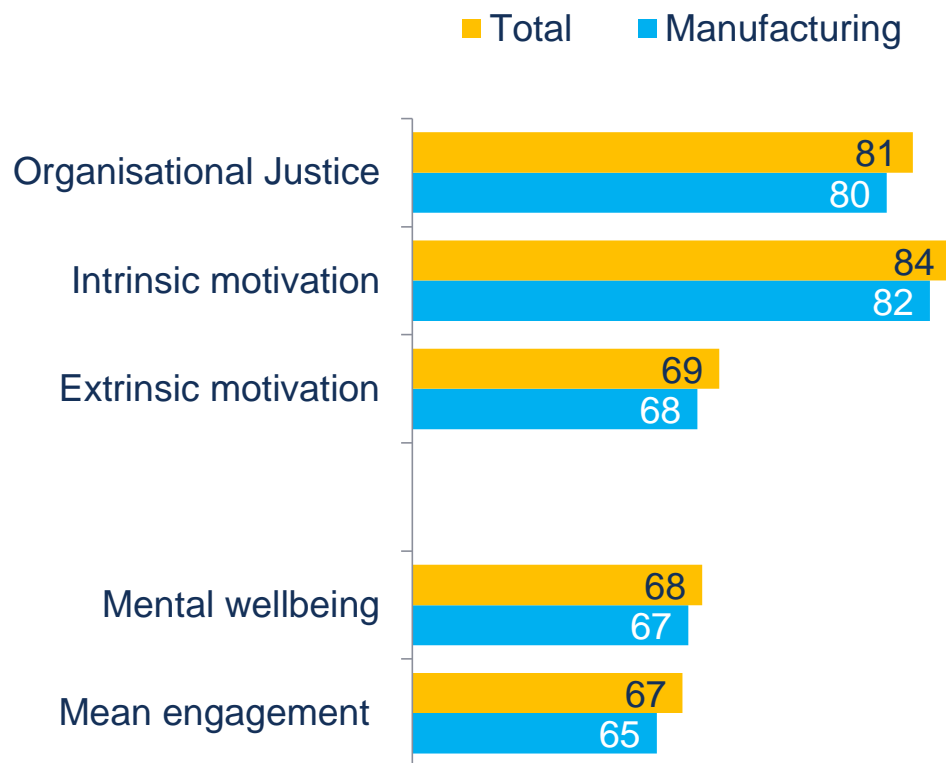
- Hand-packer
 - Digitalisation of logistics => shift in tasks (ICT-driven)
 - More complex logistical and coordination tasks are required
 - Tracking, ICT-oriented jobs created
 - Increasing segmentation: permanent employees vs temp. agency workers
- Inspection engineer
 - QC and standardisation particularly important
 - Task shifts from repetitive to advanced ICT skills
 - High levels of autonomy

Sustainable work outcomes



14% of the EU workforce are employed in the Manufacturing sector

Sustainable work outcomes II



Scale from 0 (very low) to 100 (very high)

Some conclusions

- Risk of high labour market segmentation driven by digitisation of processes and technological developments:
 - Highly specialised industrial data scientist, encryption experts, network security analysts etc.
 - Low-skilled foot soldiers with temporary employment and little incentive to invest in (access to training, benefits of tech., etc.)
- Motivation at work / to work of increasing importance for SW => crucial role of employers
- Trialogue of policy makers, employers and trade unions for workplace developments (e.g. shift of tasks for older workers)
- Public policy needs to anticipated risks of developments and react accordingly (training funds, up-skilling, step-in policies)