The changing tide of EU policy from Industry4.0 to Industry5.0: Opportunities for quality of work and working in projects

Dr. Peter Oeij

TNO / Netherlands

PROWORK Final Conference / Projectifying work: network organisation models in contemporary capitalist societies
9 February 2026

NOVA SCHOOL OF SCIENCE AND TECHNOLOGY | FCT NOVA
Universidade NOVA de Lisboa

Funded by the European Union under grant agreement No 101069651 and No 101135884. The contents of this publication are however the sole responsibility of the BRIDGES 5.0 and the SEISMEC project consortium only and do not necessarily reflect those of the European Union or HADEA. Neither the European Union nor HADEA can be held responsible for them.

Content

1. Two EU projects: Bridges5.0 and SEISMEC
1. Industry4.0 and Industry5.0
2. Quality of work and human-centricity
3. Workforce skills of Industry5.0
4. Working in projects

contact:
peter.oeij@tno.nl

Bridges5.0 is a EU research project on digitalisation, Industry5.0 and workforce skills

https://bridges5-0.eu/

SEISMEC is a EU demonstration and research project on human-centricity in sociotechnical contexts

https://seismec.eu

Content

1. Two EU projects: Bridges5.0 and SEISMEC
2. Industry4.0 and Industry5.0
3. Quality of work and human-centricity
4. Workforce skills of Industry5.0
5. Working in projects

We can ensure human-centric workplaces in the context of projectification

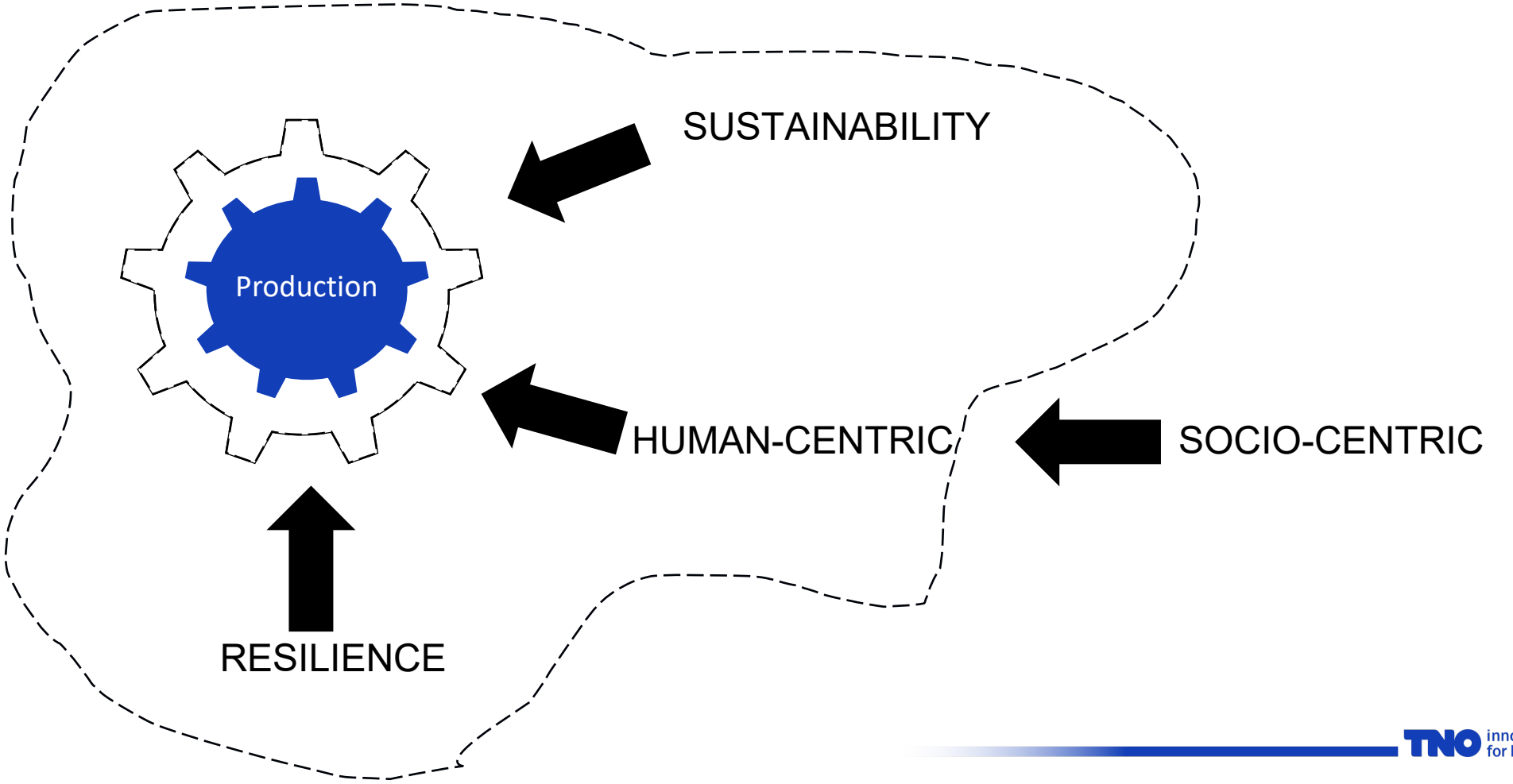
1. TWO EU PROJECTS: BRIDGES 5.0 AND SEISMEC

Rotterdam Erasmus bridge

HORIZON-EUROPE BRIDGES5.0

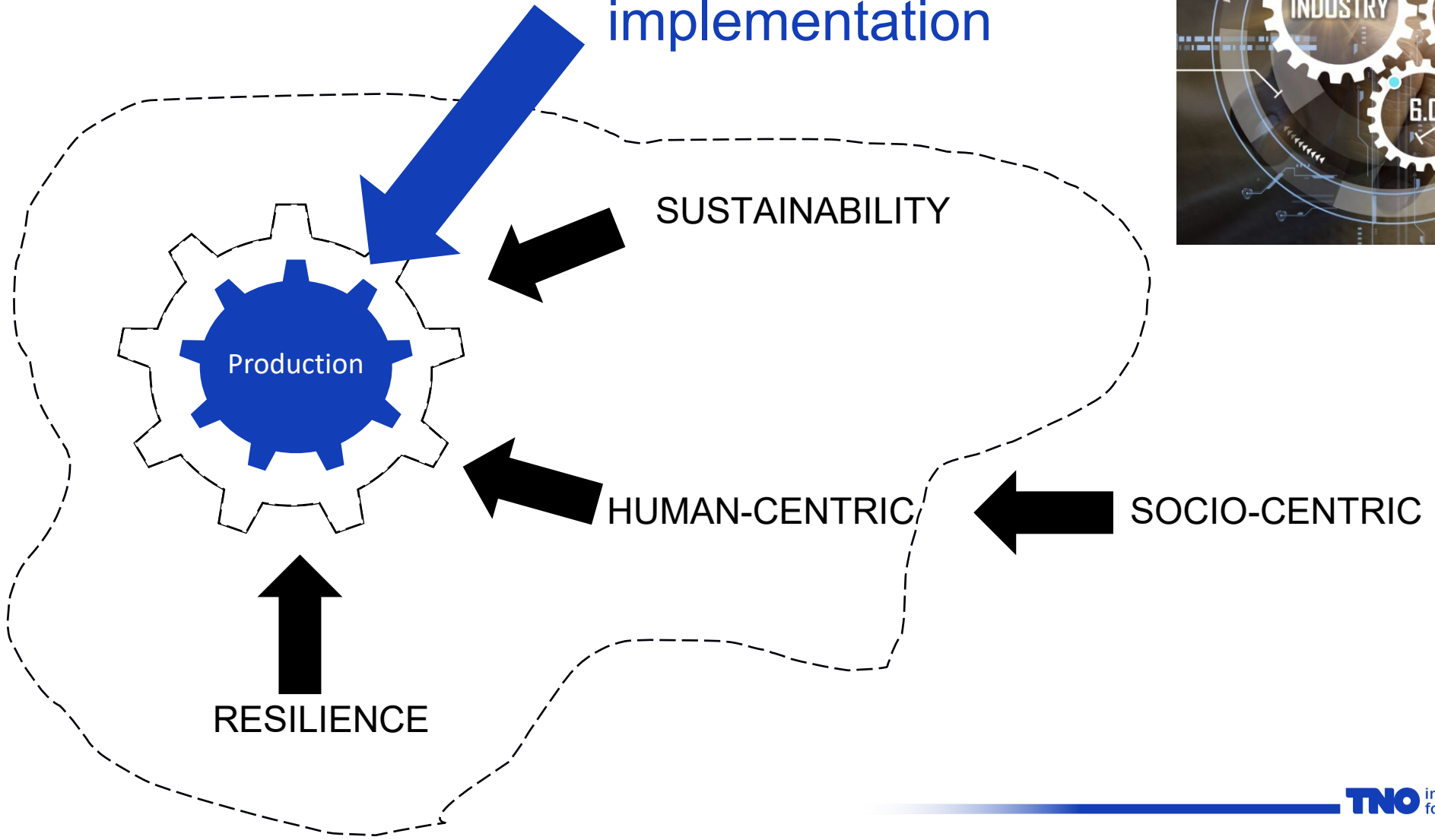
BRIDGING RISKS TO AN INCLUSIVE DIGITAL AND GREEN FUTURE BY ENHANCING WORKFORCE SKILLS FOR INDUSTRY 5.0

Industry 5.0 –context



Industry 5.0


INDUSTRY
5.0
6.0


New digital technology implementation
SUSTAINABILITY
Production
HUMAN-CENTRIC
SOCIO-CENTRIC
RESILIENCE

Industry 5.0

Required workforce skills

New training/ learning methods

SUSTAINABILITY

Production

HUMAN-CENTRIC

SOCIO-CENTRIC

RESILIENCE

Bridges 5.0 – Objectives

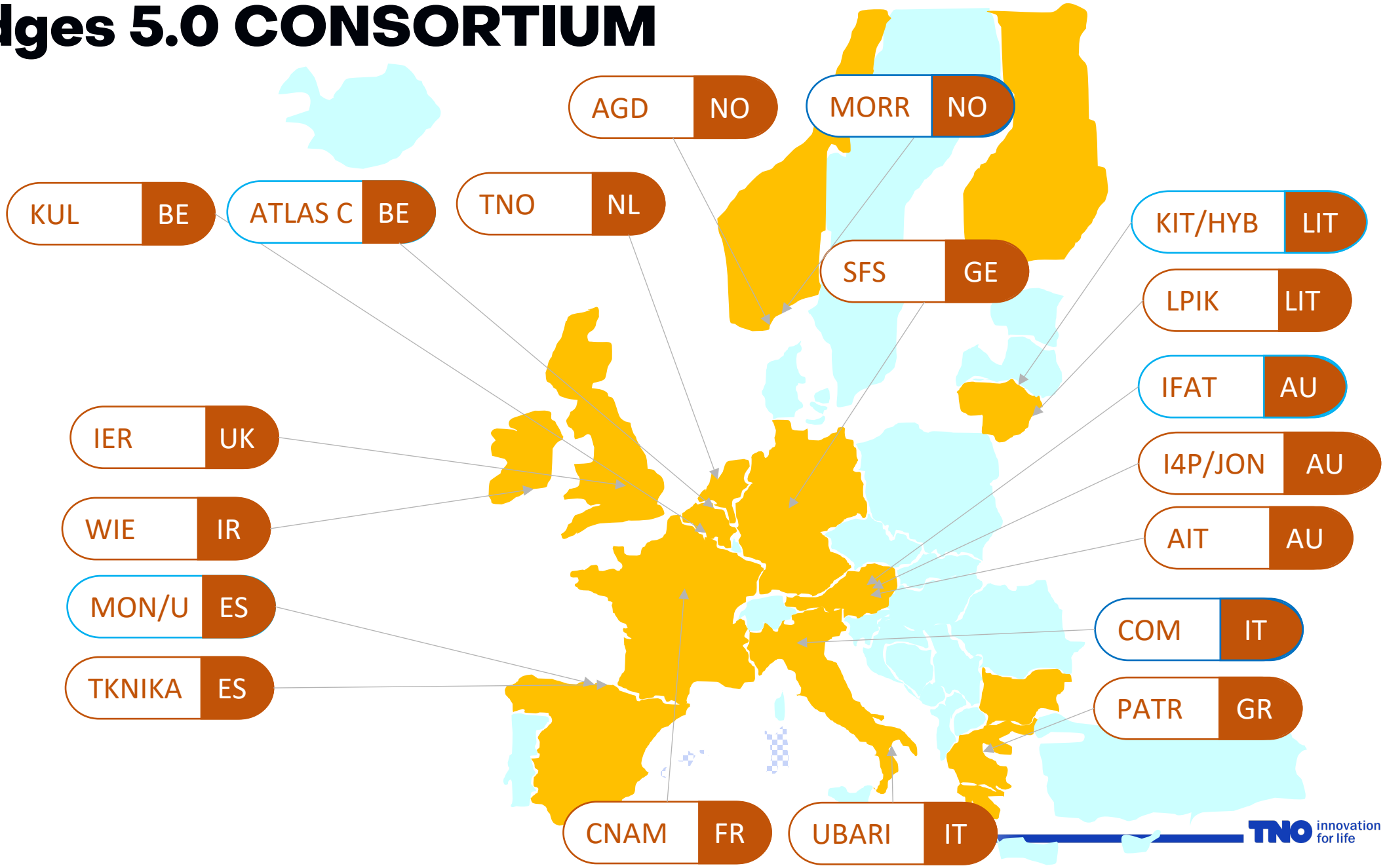
1. Mapping of transition to new green and digital jobs; meet Industry 5.0 requirements;

2. Map Industry 5.0 skills and skill gaps; and enable monitoring of skill gaps using skills taxonomies/standards;

3. Set up learning trajectories and training pathways for four target groups, i.e. managers, employed, job-seekers and students;

4. Engage a range of large companies and stakeholders (policymakers, SMEs, social partners, Vocational Educational Training (VET) providers) at regional, national and EU levels: create **Industry 5.0 Platform**.

Bridges 5.0 CONSORTIUM



General approach

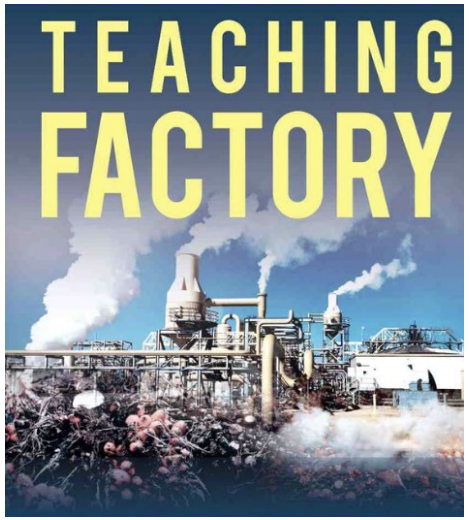
Technology → Skills → Teaching - Learning

Teaching Factory

A dynamic exchange where industry practitioners teach students, and students and faculty teach practitioners. This collaboration occurs online over an extended period, featuring regular sessions and continuous interaction between industry and academia.

Learning Factory

A concept where university facilities replicate manufacturing environments, enabling collaboration between academia and industry in specific courses aimed at imparting manufacturing concepts, trends, and knowledge in an academic setting. It resembles a hands-on workshop.



IN-COMPANY

[5 organisations]

LIVING LAB

[5 networks]

Mondragon: case of a company (teaching factory)

- https://bridges5-0.eu/teaching-and-learning-factory-interventions/

Rotterdam Erasmus bridge

HORIZON-EUROPE SEISMEC

SUPPORTING EUROPEAN INDUSTRY SUCCESS MAXIMISATION THROUGH EMPOWERMENT CENTRED DEVELOPMENT

SEISMEC

Project Outcomes + Impact

- 1: Improved **understanding of the socio-technical and ethical implications** of advanced (digital) technologies for workers and work organisation across industrial sectors
- 2: **Work and learning environments** that optimally use advanced (digital) technologies and human capabilities and creative potential synergically, thus contributing to enhanced **European industrial competitiveness** in existing and new markets
- 3: A skilled and creative industry workforce that is **empowered** through and **in control** of advanced technologies that are aligned with European social and ethical values.
- IMPACT 1: **Human-centred and ethical development** of digital and industrial technologies, through two-way engagement empowering end-users and workers, and supporting social innovation.

SEISMEC

TNO innovation for life

SEISMEC Partners and Pilots

Netherlands *(Health & Proximity)*
Erasmus University Rotterdam
Buurtzorg Concepts& Consultancy
Stichting Buurtzorg Nederland
Go Tulip (Bondi)
Netherlands Organisation for Applied Scientific Research

Belgium *(Energy Intensive Industries)*
SD Worx People Solutions NV
Atlas Copco Airpower NV
European Confederation of Independent Trade Unions

Germany
Technical University Berlin

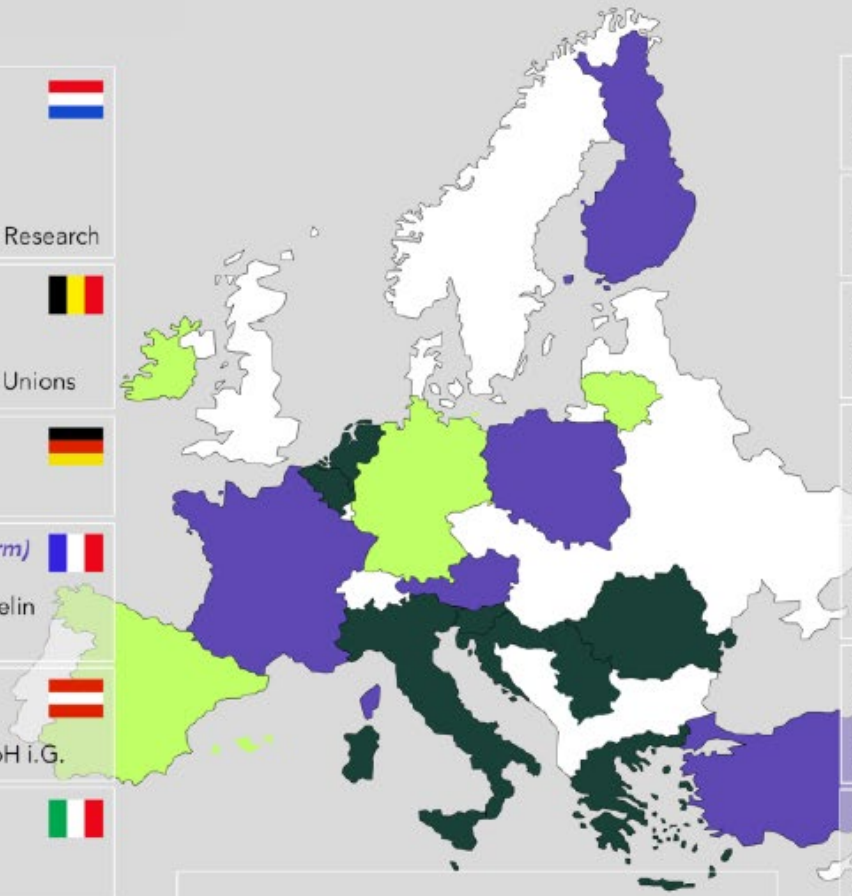
France *(Mobility, transport & Proximity & Platform)*
Thales Six GTS France
Manufacture Française des pneumatiques Michelin
Malt Community

Austria *(Electronics & Retail)*
Infineon Technologies Austria AG
farmNOW Shared Vertical Impact Farming GmbH i.G.

Italy *(Textile)*
Fratelli Piacenza S.P.A.
Citta Studi SPA

Ireland
University College Cork
National University of Ireland

Spain
Australo



Research and other partners

Pilot countries

Both pilot countries and research, other partners

(Industrial sectors for pilots listed in brackets)

Lithuania *(Agri-food)*
Lithuanian Scientific Society
Kvalitetas JSC

Poland *(Construction)*
Mostostal Warszawa S.A.

Slovenia *(Tourism)*
Rra Zeleni Kras Doo
Arctur Computer Engineering

Croatia *(Aerospace & Defense)*
International Zagreb Airport JSC
Infra Plan

Romania *(Digital)*
Transilvania IT Association
NTT DATA Romania S.A.

Serbia *(Culture & Creative Industries)*
NS Web Development
The Institute for Artificial Intelligence - Research and Development of Serbia

Greece *(Agri-food)*
Arivia S.A.
Centre for Research and Technology Hellas CERTH
Institute of Entrepreneurship Development

Finland *(Retail)*
Intellectual Farms Oy

Turkey *(Energy Renewables)*
Ates Wind Power

General approach: two lines of reasoning

Technology → Human-centric approach → Human-centric culture

Implementation process

(worker participation)

Technology → Human-centric → Human-centric job quality and job satisfaction

Implemented in organisation

Job content

SEISMEC

SEISMEC

17 pilots in 14 countries implementing a new (digital) technology

-Human-centric process

-Human-centric outcomes for job quality

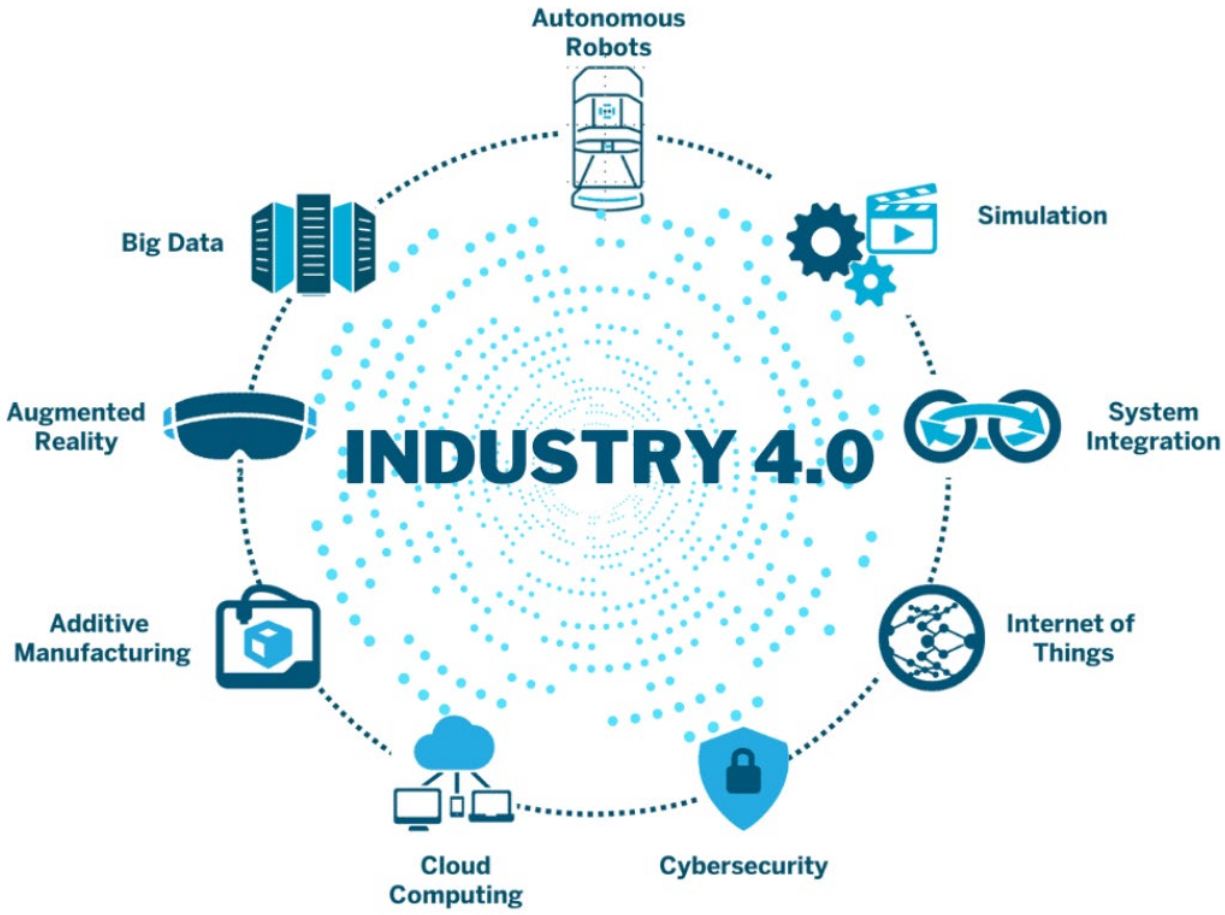
2. INDUSTRY 4.0 AND INDUSTRY 5.0

What is Industry 4.0 (1)

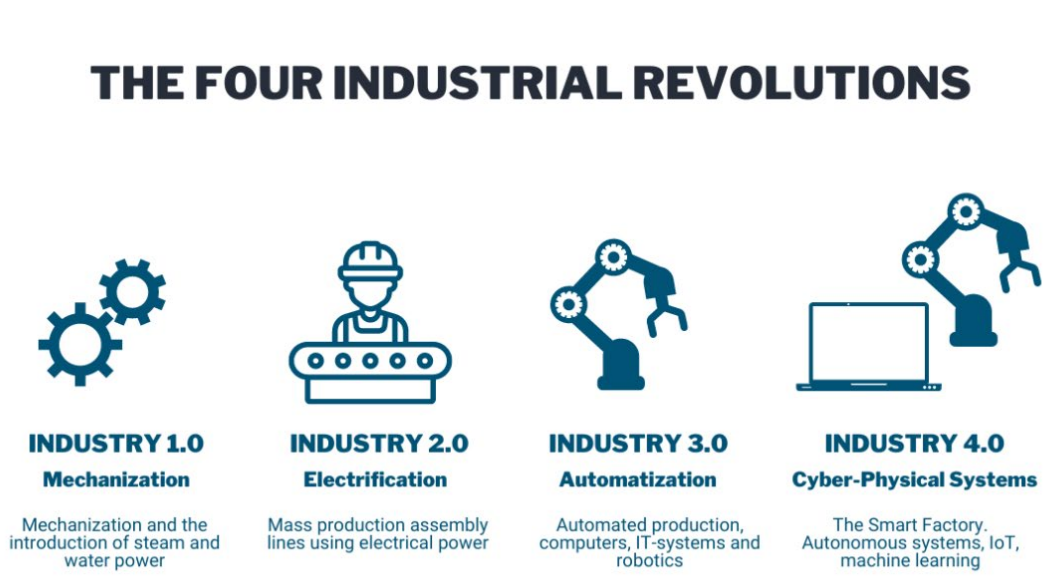
Industry 4.0 > fourth Industrial Revolution

-interconnectivity, automation, machine learning, and real-time data.

Simply said: the digital transformation of manufacturing

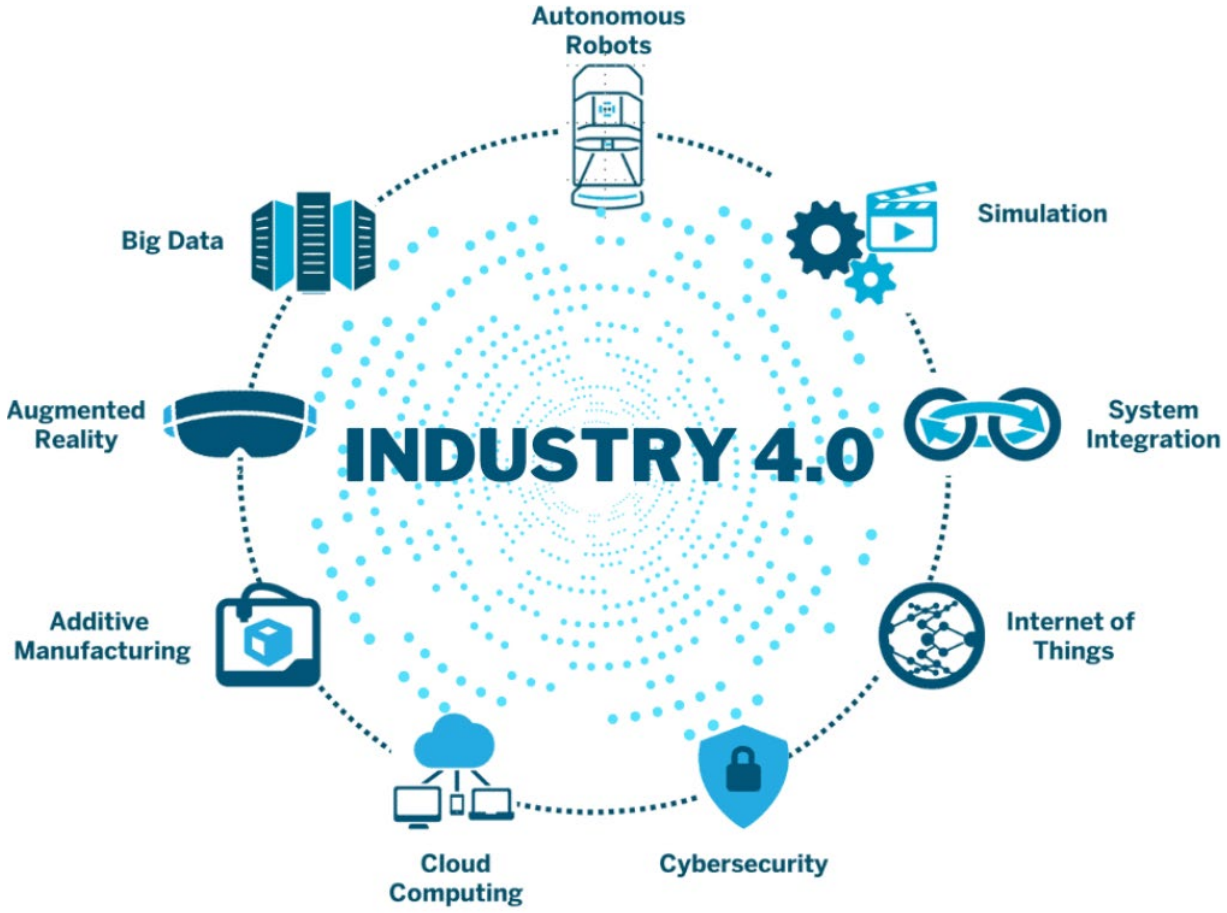


What is Industry 4.0 (2)



Industry 4.0 benefits

- **Improved Productivity and Efficiency:** Businesses are making data-driven decisions across their operations, improving forecast accuracy, supporting on-time delivery, and building profit-optimized plans.
- **Flexibility and Agility:** It's easier to scale production up or down in a Smart Factory as well as introducing new products to the production line.
- **Better Customer Experience:** The customer experience will enhance with automated track and trace capabilities.
- **Innovation opportunities:** Better knowledge of the manufacturing process leads to opportunities to innovate.
- **Green and Sustainable Solutions:** Less resources, material, and product waste will both lead to an increased probability and a more sustainable solution.



Why Industry 5.0?

REDUCED COST due to resource efficiency

Improved **SAFETY** and **WELL-BEING**

EMPOWERED WORKERS remaining in control

COMPETITVE EDGE in new markets

Adapted **TRAINING FOR EVOLVING SKILLS**

Competitve industry by **ATTRACTING BEST TALENT**

Industry 5.0 is a **SOLUTION PROVIDER** for people and for our planet

Why Industry 5.0?

REDUCED COST due to resource efficiency

Improved **SAFETY** and **WELL-BEING**

COMPETITVE EDGE in new markets

Adapted **TRAINING FOR EVOLVING SKILLS**

Competitve industry by **ATTRACTING BEST TALENT**

Industry 5.0 is a **SOLUTION PROVIDER** for people and for our planet

From shareholder to stakeholder value

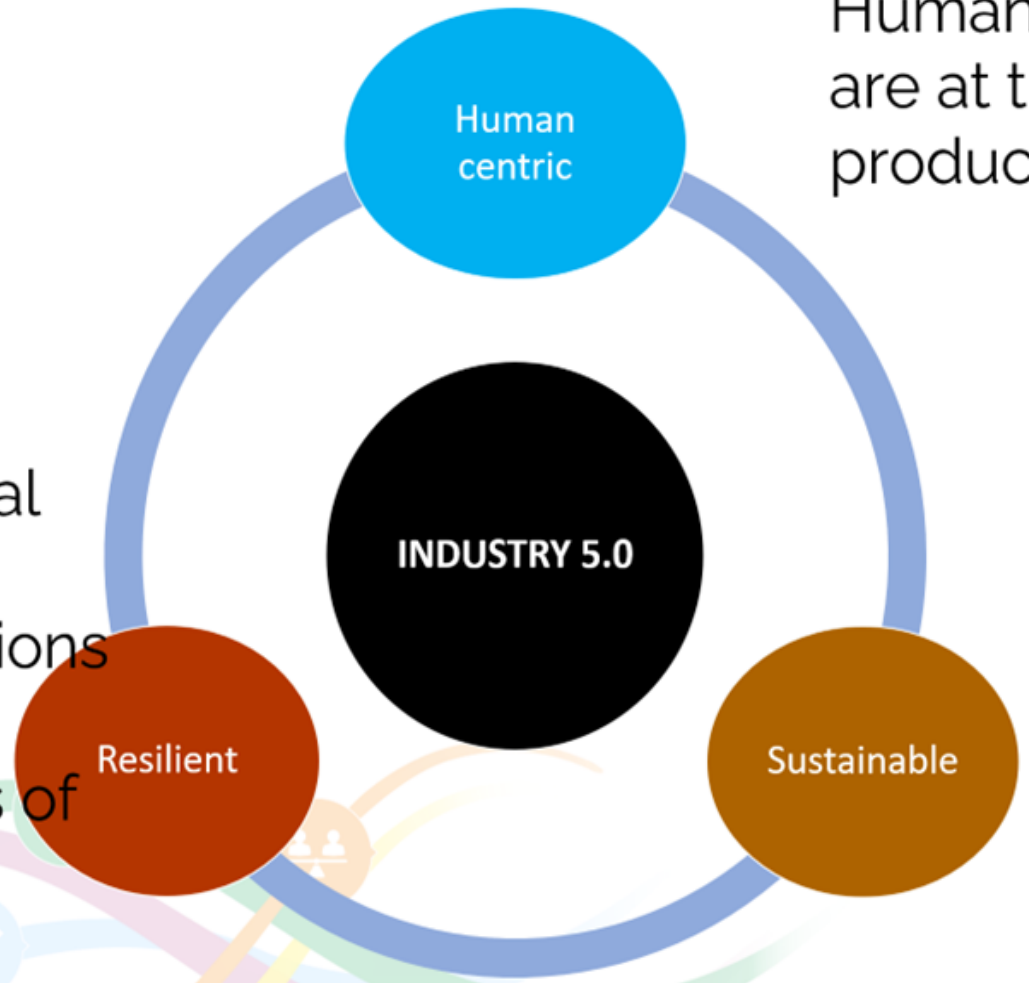
INDUSTRY 5.0

human-centric, sustainable and resilient

European Commission

Industry 5.0 Elements

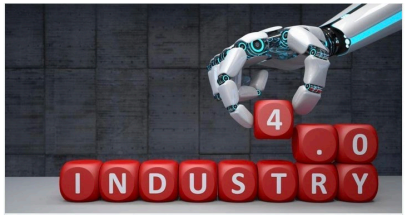
Human needs and interests are at the heart of the production process



Higher degree of robustness in industrial production, arming it better against disruptions and ensuring critical infrastructure in times of crisis

Circular processes that re-use, re-purpose and recycle natural resources, reduce waste and environmental impact

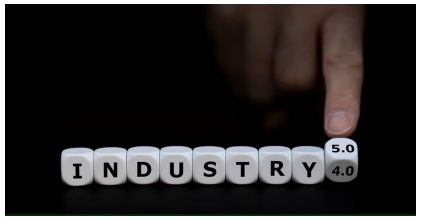
INDUSTRY4.0



Commonalities:
-apply newest (digital) technologies and continuous innovation;
-digitalisation pervades into all production processes;
-I5.0 does not replace but complements I4.0 with human and social values.

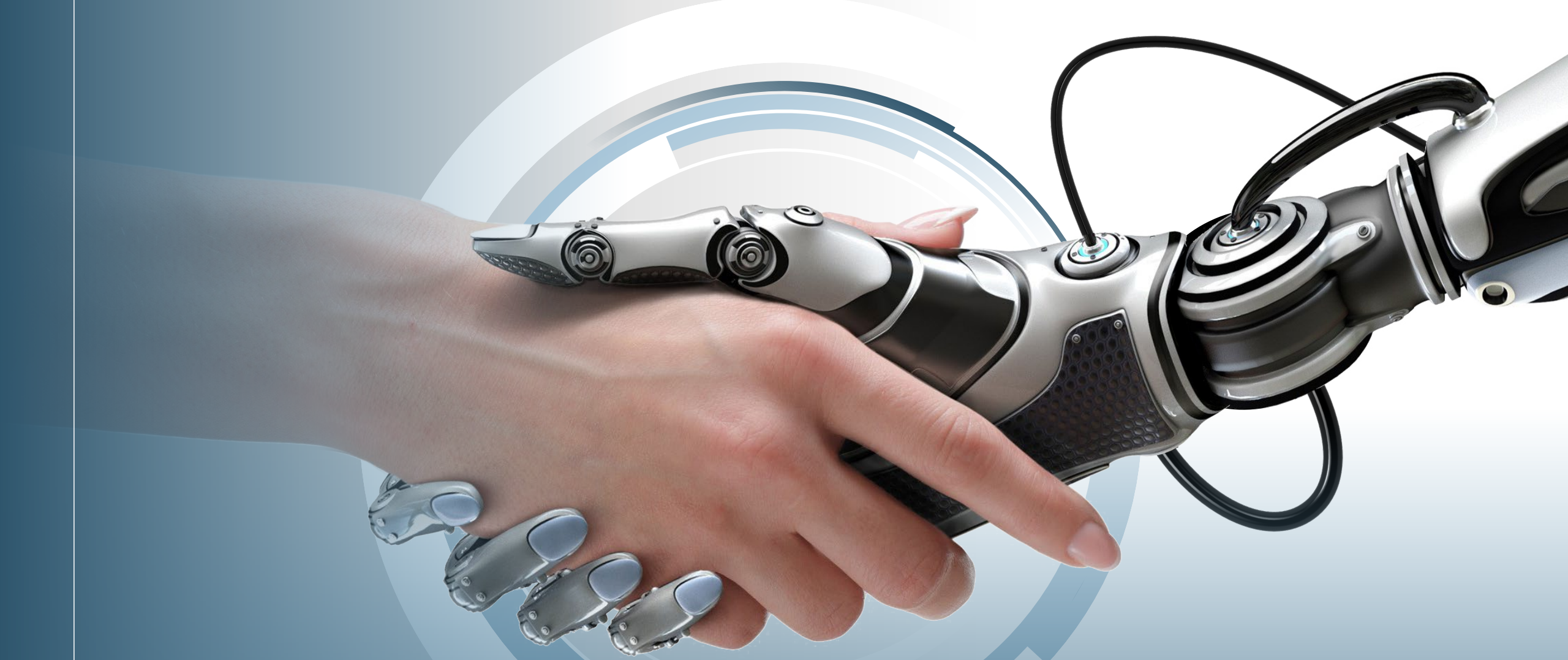
- Techno -driven
  - increase efficiency and flexibility
  - smart factory / connectivity
- Shareholder driven
  - limited interest for society
  - limited interest in environmental issues
  - dominance neo-liberal model
- Economic value driven
  - job destruction is no issue
  - obsoletion of skills not responsibility of industries

INDUSTRY5.0



- Sustainability
  - circularity
  - reduce energy / emissions
  - not jeopardise future generations
- Human-centric
  - technology should support humans
  - technology should adapt to humans
  - technology not impinge worker's rights
- Resilient
  - more robust / critical infrastructure
  - strategic value chains / security

Source: Breque et al. (2021). Industry 5.0: Towards a sustainable, human-centric and resilient European industry (European Commission, DG R&I).



3. QUALITY OF WORK AND HUMAN-CENTRICITY

Quality of work = job quality

job design and the nature of work;

terms of employment;

pay and benefits;

social support and cohesion;

health, safety and psychosocial wellbeing;

work–life balance;

voice and representation

job content;

terms of employment;

terms of employment;

employment relationship;

working conditions;

employment relationship;

industrial relations

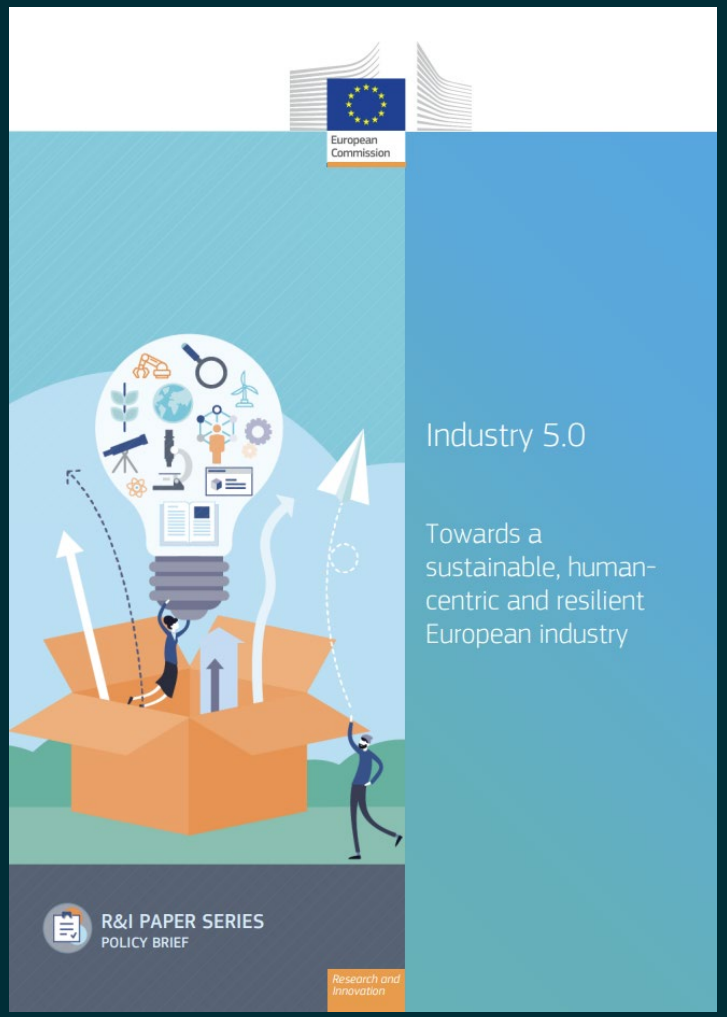
Warhurst et al, 2017, 2022

"… a human-centric approach in industry puts core human needs and interests at the heart of the production process.

Rather than asking what we can do with new technology, we ask what the technology can do for us.

Rather than asking the industry worker to adapt his or her skills to the needs of rapidly evolving technology, we want to use technology to adapt the production process to the needs of the worker, e.g. to guide and train him/her.

It also means making sure the use of new technologies does not impinge on workers' fundamental rights, such as the right to privacy, autonomy and human dignity."



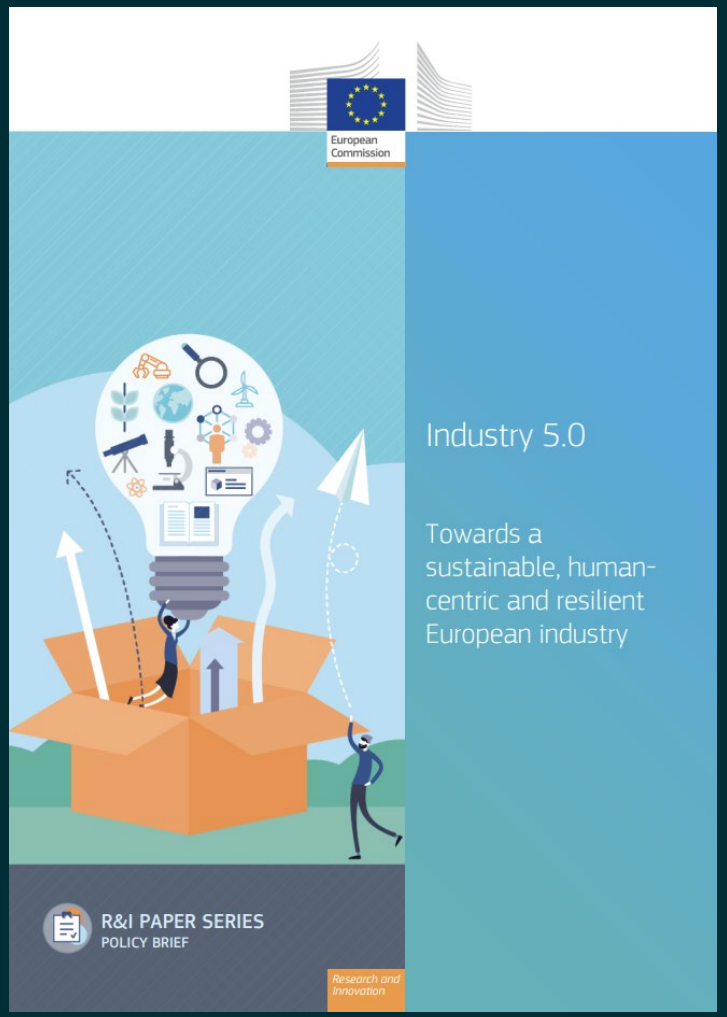
Source:
Breque et al., 2021: p. 14

"… a human-centric approach in industry puts core human needs and interests at the heart of the production process.

Rather than asking what we can do with new technology, we ask what the technology can do for us.

Rather than asking the industry worker to adapt his or her skills to the needs of rapidly evolving technology, we want to use technology to adapt the production process to the needs of the worker, e.g. to guide and train him/her.

It also means making sure the use of new technologies does not impinge on workers' fundamental rights, such as the right to privacy, autonomy and human dignity."



Source:
Breque et al., 2021: p. 14

Human-centricity

- Core human needs: autonomy, competence, relatedness (self-determination theory)
- Human interests: job satisfaction and economic well-being, but also individual preferences for specific tasks and environments (SMART work design model)
- Augmenting and supporting technology, adaptation to the human
- Recognize workers' fundamental rights

Sources:
Breque et al., 2021
Oeij, Dhondt & Vaas, 2025
Parker et al., 2025

Human-centricity

- Core human needs: autonomy, competence, relatedness (self-determination theory)
- Human interests: job satisfaction and economic well-being, but also individual preferences for specific tasks and environments (SMART work design model)
- Augmenting and supporting technology, adaptation to the human
- Recognize workers' fundamental rights

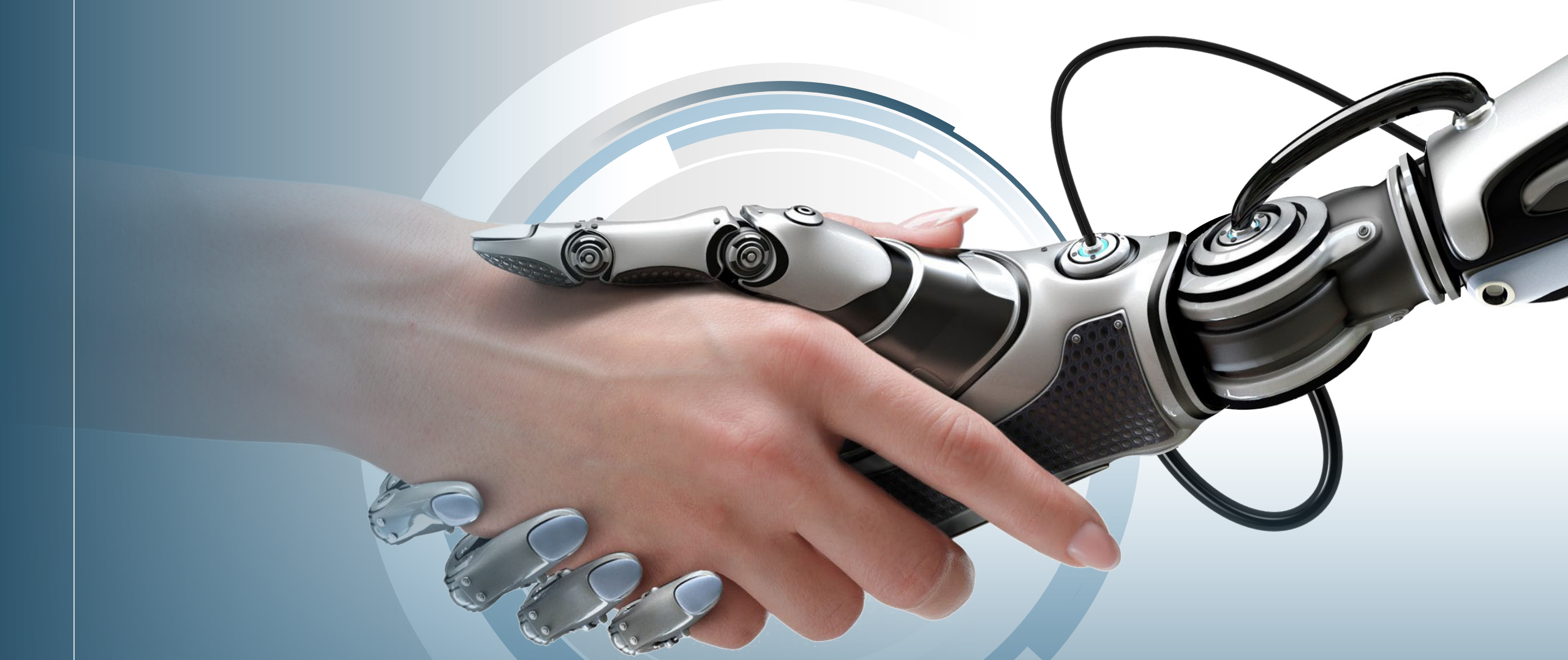
Workplace

- The heart of the production process: the place or work station where people carry out their work, where their tasks are executed, which is in their job (a set of tasks and activities that result in a certain output)
- Job quality: the characteristics of tasks allocated to a job

Sources:
Breque et al., 2021
Oeij, Dhondt & Vaas, 2025
Parker et al., 2025

Human-centricity workplace

- High Job quality
- > fulfils human needs
- > fulfils human interests
- > free of technological threats
- > free of impingement of rights
- > free of occupational health and safety risks and performance (productivity) risks



4. WORKFORCE SKILLS OF INDUSTRY5.0

	Create I5.0	Work in I5.0
General	▪ Design and use digital technologies and AI systems in a way that meets Industry 5.0's three objectives ▪ Include human-centric, resilient and sustainable values in business models and KPIs.	▪ Learn to and work with existing, new and complex digital technologies and AI systems.

Oeij et al., 2025

	Create I5.0	Work in I5.0
General	▪ Design and use digital technologies and AI systems in a way that meets Industry 5.0's three objectives ▪ Include human-centric, resilient and sustainable values in business models and KPIs.	▪ Learn to and work with existing, new and complex digital technologies and AI systems.
Human-centric	▪ Understand human-centricity ▪ Include basic humanised values, e.g., autonomy, voice, participation and self-fulfilment (based on evidence-based criteria of job/work design) ▪ Support and implement worker empowerment in decision-making processes aimed at change and daily operations ▪ Empower through workload optimization/ decision-making and act inclusive ▪ Appy a *human in command*-principle with respect to human-technology interaction ▪ Use human-centred design methods ▪ Use assistive/supporting/augmenting technologies	▪ Demonstrate intrapreneurship and make use of being empowered ▪ Make use of learning opportunities (see also Resilience) ▪ Participate in processes related to (re) design/change ▪ Adopt an inclusive attitude ▪ Be able to communicate in participation processes (internal and external interaction) Working with assistive technologies

Oeij et al., 2025

	Create I5.0	Work in I5.0
General	▪ Design and use digital technologies and AI systems in a way that meets Industry 5.0's three objectives ▪ Include human-centric, resilient and sustainable values in business models and KPIs.	▪ Learn to and work with existing, new and complex digital technologies and AI systems.
Human-centric	▪ Understand human-centricity ▪ Include basic humanised values, e.g., autonomy, voice, participation and self-fulfilment (based on evidence-based criteria of job/work design) ▪ Support and implement worker empowerment in decision-making processes aimed at change and daily operations ▪ Empower through workload optimization/ decision-making and act inclusive ▪ Appy a *human in command*-principle with respect to human-technology interaction ▪ Use human-centred design methods ▪ Use assistive/supporting/augmenting technologies	▪ Demonstrate intrapreneurship and make use of being empowered ▪ Make use of learning opportunities (see also Resilience) ▪ Participate in processes related to (re) design/change ▪ Adopt an inclusive attitude ▪ Be able to communicate in participation processes (internal and external interaction) Working with assistive technologies
Resilient	▪ Assess the company's dependencies through different scenario planning and risk assessments ▪ Develop a resilient production process, and along the value chain ▪ Develop a resilient network of suppliers, partners, and customers (systemic thinking) / supply chain/value chain ▪ Encourage creativity, innovation, and flexibility, e.g. by providing learning opportunities for them ▪ Implement training and education systems that develop KSAs) knowledge, skills, abilities) ▪ Develop strong risk management policies and financial resilience	▪ Understand/integrate resilience into company policies ▪ Engage in lifelong learning and develop the ability to adapt and to creativity ▪ Reflect on and respond to the resilience of the work process and analyse and solve problems at the systems level ▪ Manage yourself

Oeij et al., 2025

	Create I5.0	Work in I5.0
General	▪ Design and use digital technologies and AI systems in a way that meets Industry 5.0's three objectives ▪ Include human-centric, resilient and sustainable values in business models and KPIs.	▪ Learn to and work with existing, new and complex digital technologies and AI systems.
Human-centric	▪ Understand human-centricity ▪ Include basic humanised values, e.g., autonomy, voice, participation and self-fulfilment (based on evidence-based criteria of job/work design) ▪ Support and implement worker empowerment in decision-making processes aimed at change and daily operations ▪ Empower through workload optimization/ decision-making and act inclusive ▪ Appy a *human in command*-principle with respect to human-technology interaction ▪ Use human-centred design methods ▪ Use assistive/supporting/augmenting technologies	▪ Demonstrate intrapreneurship and make use of being empowered ▪ Make use of learning opportunities (see also Resilience) ▪ Participate in processes related to (re) design/change ▪ Adopt an inclusive attitude ▪ Be able to communicate in participation processes (internal and external interaction) Working with assistive technologies
Resilient	▪ Assess the company's dependencies through different scenario planning and risk assessments ▪ Develop a resilient production process, and along the value chain ▪ Develop a resilient network of suppliers, partners, and customers (systemic thinking) / supply chain/value chain ▪ Encourage creativity, innovation, and flexibility, e.g. by providing learning opportunities for them ▪ Implement training and education systems that develop KSAs) knowledge, skills, abilities) ▪ Develop strong risk management policies and financial resilience	▪ Understand/integrate resilience into company policies ▪ Engage in lifelong learning and develop the ability to adapt and to creativity ▪ Reflect on and respond to the resilience of the work process and analyse and solve problems at the systems level ▪ Manage yourself
Sustainable	▪ Care for the environment ▪ Provide the knowledge for workers to do so ▪ Carry out environmental impact and lifecycle assessments ▪ Make and promote 'green choices, use green technologies, develop green tasks and design and implement circular processes	▪ Care for the environment and act sustainably ▪ Understand circularity and carry out lifecycle and environmental impact assessments ▪ Evaluate green technologies ▪ Elaborate resources efficiency

Table 1: An overview of directions in which to develop Industry 5.0 workforce skills

Oeij et al., 2025

Table: 1. Top 10 Skills for 2015 vs 2025 (Li, 2024)

Top 10 Skills (2015)	**Top 10 Skills (2025)**
Complex problem solving	Analytical thinking and innovation
Coordinating with others	Active learning and learning strategies
People management	Complex problem solving
Critical thinking	Critical thinking and analysis
Negotiation	Creativity, originality and initiative
Quality control	Leadership and social influence
Service orientation	Technology use, monitoring and control
Judgment and decision making	Technology design and programming
Active listening	Resilience, stress tolerance and flexibility
Creativity	Reasoning, problem-solving and ideation

Based on World Economic Forum

Skills in the age of AI

Table 2: Emerging vs Declining Workforce Jobs (Hernández-de-Menéndez et al., 2020)

Emerging Workforce Jobs	**Declining Workforce Jobs**
Data analysts and scientists	Data entry clerks
AI and machine learning specialists	Accounting, bookkeeping and payroll clerks
Big data specialists	Administrative and executive secretaries
Digital marketing and strategy specialists	Assembly and factory workers
Process automation specialists	Client information and customer service workers
Business development professionals	Business services and administration managers
Digital transformation specialists	Human resources specialists
Information security analysts	Mechanics and machinery repairers
Software and application developers	Material-recording and stock-keeping clerks
Internet of Things specialists	Postal service clerks

HUMAN CENTRIC JOBS REMAIN ESSENTIAL IN AI DRIVEN FUTURE

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).

References in: Oeij & Lecoeur, forthcoming)

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).

References in: Oeij & Lecoeur (forthcoming)

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).
-Further growth of Platform Work and Gig Economy: flexible work arrangements grow but often lack traditional protections and job security (Dawid, 2024).

References in: Oeij & Lecoeur (forthcoming)

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).
-Further growth of Platform Work and Gig Economy: flexible work arrangements grow but often lack traditional protections and job security (Dawid, 2024).
-Remote and Hybrid Work models: global talent competition increases as do challenges in work-life balance and cohesion, and managing the workforce (Cisco, 2025).

References in: Oeij & Lecoeur (forthcoming)

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).
-Further growth of Platform Work and Gig Economy: flexible work arrangements grow but often lack traditional protections and job security (Dawid, 2024).
-Remote and Hybrid Work models: global talent competition increases as do challenges in work-life balance and cohesion, and managing the workforce (Cisco, 2025).
-Ethical and Regulatory Challenges: AI-driven decisions raise concerns about bias, privacy, and accountability, and fair competition (level playing fields) (Harris, 2025).

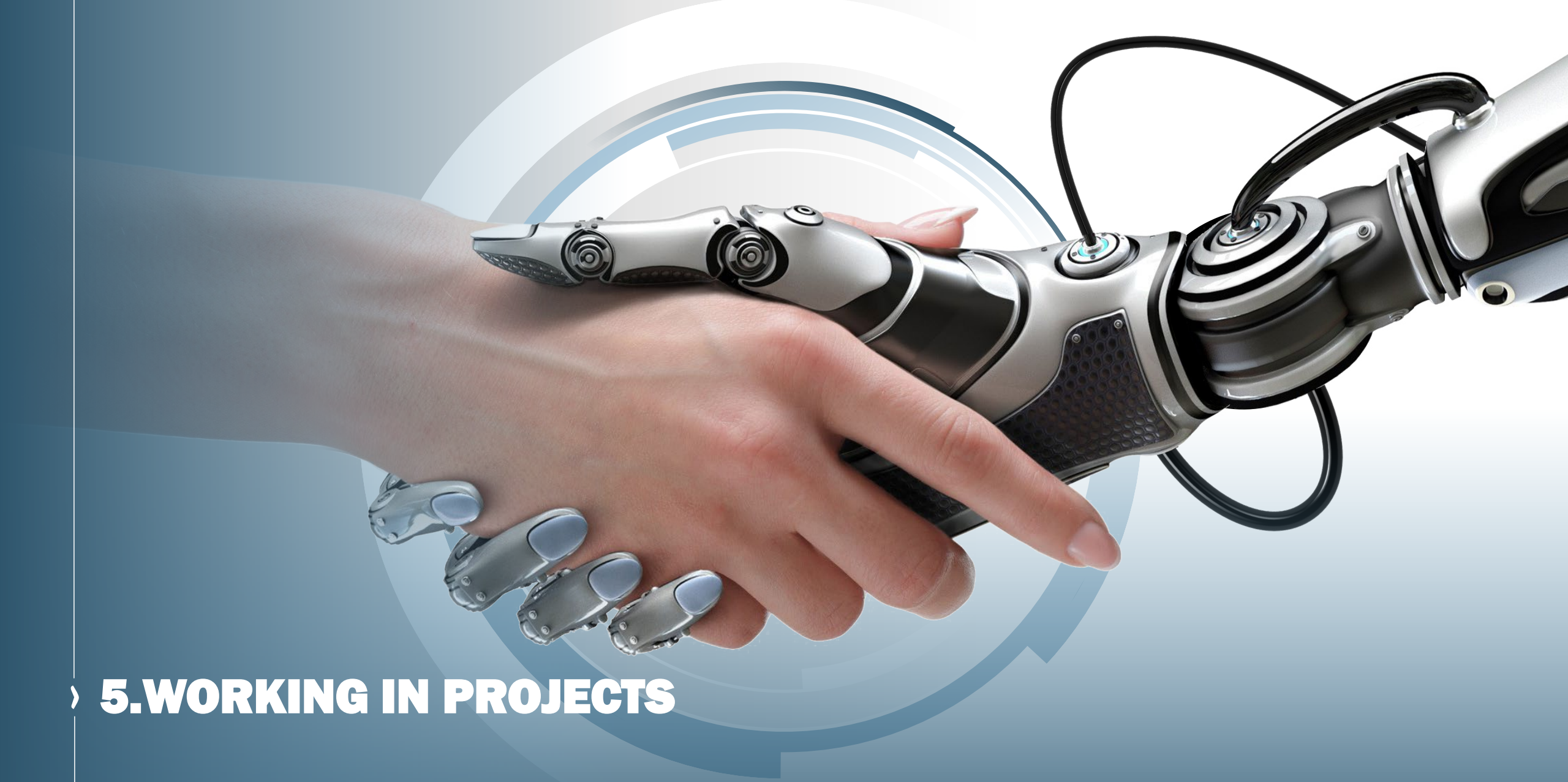
Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).
-Further growth of Platform Work and Gig Economy: flexible work arrangements grow but often lack traditional protections and job security (Dawid, 2024).
-Remote and Hybrid Work models: global talent competition increases as do challenges in work-life balance and cohesion, and managing the workforce (Cisco, 2025).
-Ethical and Regulatory Challenges: AI-driven decisions raise concerns about bias, privacy, and accountability, and fair competition (level playing fields) (Harris, 2025).
-Human–AI Collaboration: jobs increasingly involve managing and complementing AI systems and searching for best combinations of humans and AI (Vaccaro et al., 2024).

Expected developments:

-The risk of Job Polarisation: routine tasks become automated; high-skill and low-skill jobs dominate, and middle-skill jobs shrink (Acemoglu & Loebbing, 2022).
-Lifelong Learning becomes essential: continuous reskilling and upskilling are critical for digital literacy and AI-related skills (Bayly-Castaneda et al., 2024).
-Further growth of Platform Work and Gig Economy: flexible work arrangements grow but often lack traditional protections and job security (Dawid, 2024).
-Remote and Hybrid Work models: global talent competition increases as do challenges in work-life balance and cohesion, and managing the workforce (Cisco, 2025).
-Ethical and Regulatory Challenges: AI-driven decisions raise concerns about bias, privacy, and accountability, and fair competition (level playing fields) (Harris, 2025).
-Human–AI Collaboration: jobs increasingly involve managing and complementing AI systems and searching for best combinations of humans and AI (Vaccaro et al., 2024).
-Social Safety nets and inclusion: automation risks are widening inequality; policies like UBI (uniform basic income) and portable benefits may emerge (O'Leary, 2025).

References in: Oeij & Lecoeur (forthcoming)



5.WORKING IN PROJECTS

Projectification

- A project is a set of tasks aimed at achieving a specific outcome, and a project structure is a temporary structure within which the tasks are performed.
- Projectification is a process of change whereby organisations increasingly adopt a project way of work.
- Hence, a projectified organisation becomes a hybrid of temporary structures managed as projects and permanent structures managed as functions or departments.
- Projectification implies increased organisational complexity.
- Still, projectification fosters innovation and change, making it a necessary feature in many modern organisations. Ideally, projectification should be done gradually, and it requires significant changes throughout the organization.
- Seven recommendations; one of them is **'agile teamwork'**

(Source: Lovett et al., (2025). Seven recommendations for managing projectification. *Business Horizons* , 68, 21-32)

Agile Teamwork

- Establish broker and steward roles to support teams with resources and manage client relationships;
- Empower teams to self-organize and guide them with nudges;
- Solicit confidential peer feedback to identify high and low performers; and
- Consistently reward high-performing team

(Source: Lovett et al., (2025). Seven recommendations for managing projectification. *Business Horizons* , 68, 21-32.)

Industry 5.0 and work in projects

- Platform work , Gig economy
- Self-employed workers
- Algorithmic management ('Ueberisation')
- Jobs change into variable task-combinations
- High flexibility
- Contraints Scope, Time, Cost - tension quality, workstress, job satisfaction
- Gen AI taking over???

Industry 5.0 and work in projects

Job quality dimensions

job design and the nature of work;	• Could be rich or poor
terms of employment;	• Uncertainty, high flexibility
pay and benefits;	• Could be good or insecure
social support and cohesion;	• Team building is low
health, safety, psychosocial wellbeing;	• Stress risks are high
work–life balance;	• Requires flexible mindset
voice and representation	• Low

Industry 5.0 and work in projects

Job quality dimensions

job design and the nature of work;	• Could be rich or poor
terms of employment;	• Uncertainty, high flexibility
pay and benefits;	• Could be good or insecure
social support and cohesion;	• Team building is low
health, safety, psychosocial wellbeing;	• Stress risks are high
work–life balance;	• Requires flexible mindset
voice and representation	• Low

Opportunities and risks:

-depends on human-centric company practices

-market situation and labour market position

-choices about technology

What can project companies / organisation do?

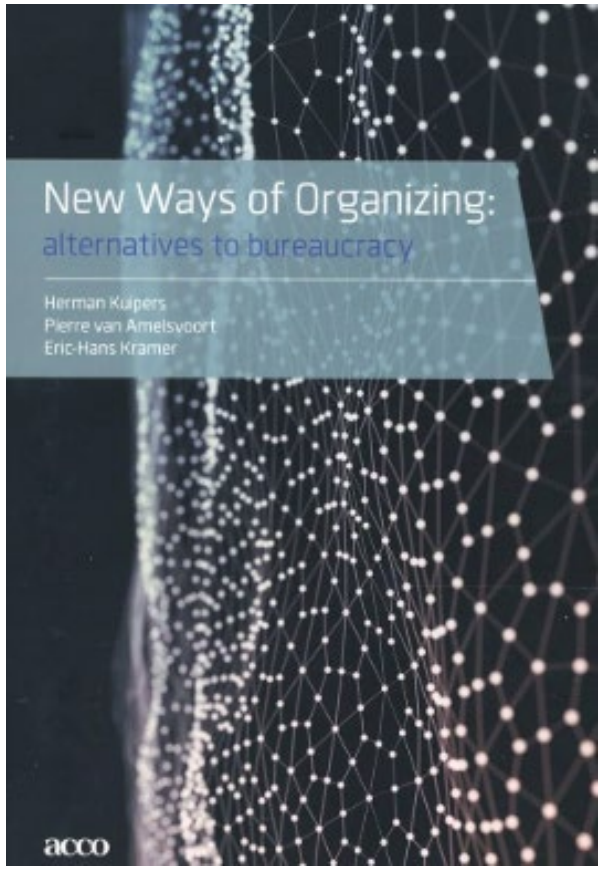
- 1.Create teams with a 'complete task' that includes the autonomy to solve any problem that occurs at the level of team work (self organising and highly autonomous team work)
- 2.Build a Mindful infrastructure
- 3.Ensure Innovation Resilience Behaviour

(Source: Oeij (2017). The Resilient Innovation Team.)

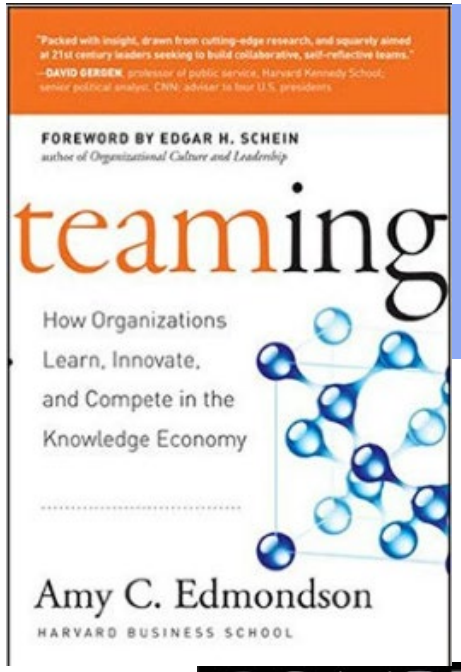
2.Lowlands Sociotechnical Design & team work

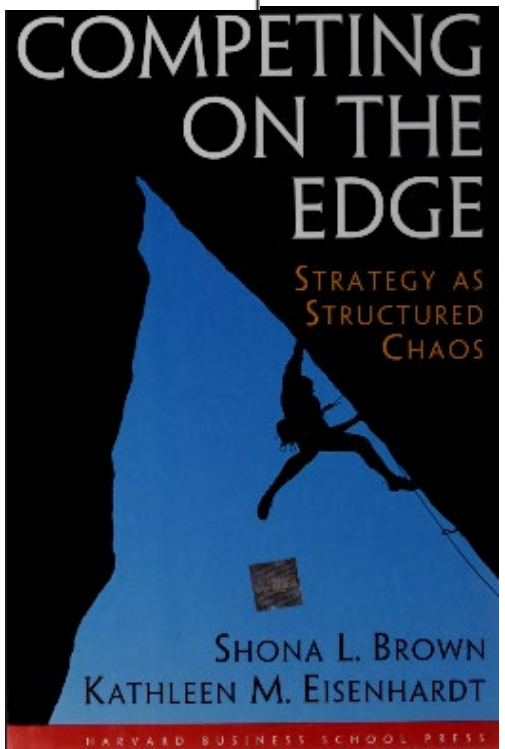
Key Principles:

- Autonomous Groups: Teams are responsible for a complete, measurable set of tasks.
- Multi-skilling: Team members possess complementary skills and rotate roles.
- Direct Interaction: Low-level and high-level employees often work closely together, reducing the need for administrative layers and coordination.



[Source Kuipers et al., 2020]



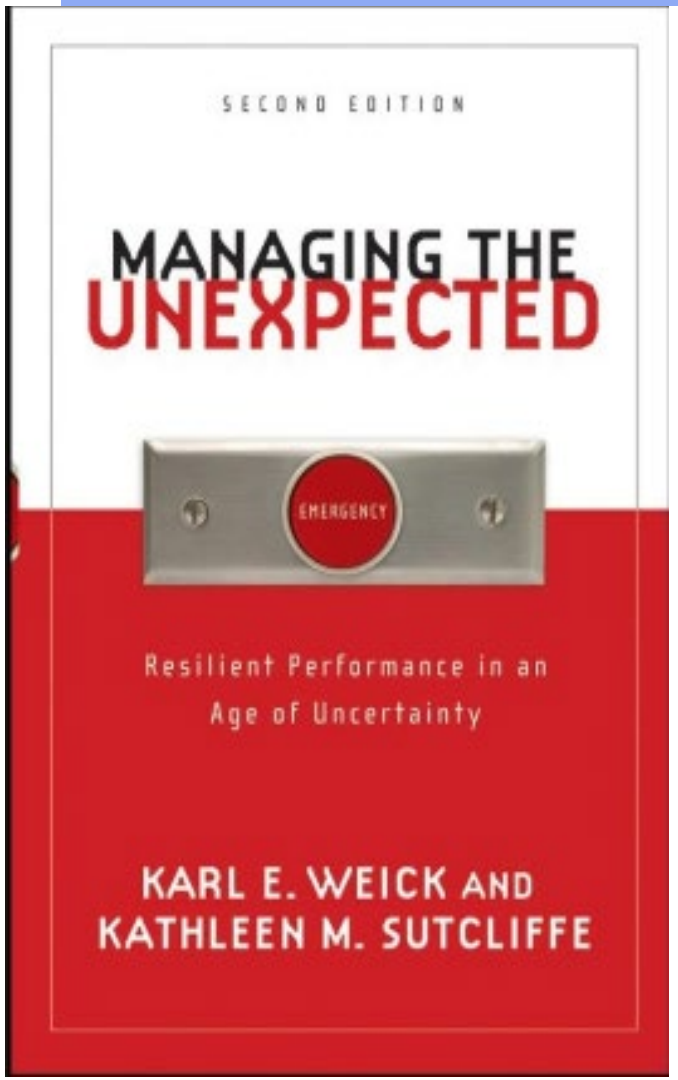


2.Build a ‘Mindful Infrastructure’

- A 'semi-structure' which is something between culture and structure of an organisation (how we do things here):

1. team psychological safety
2. team learning behaviour
3. complexity leadership
4. team voice

3. Ensure ‘(Innovation) Resilience Behaviour’



- Team competencies (team capability) to make a team bounce back to the right track of the project once a team has taken/is taking an ineffective course with regard to its (innovation) goal

- Team behaviours:
  - a] being extremely alert to track small failures (weak signals);
  - b] resist oversimplification,
  - c] remain sensitive to team operations and interactions,
  - d] maintain able to bounce back and recover (resilience);
  - e] defer to expertise

Mindful infrastructure

Innovation Resilience Behaviour

Team results

Team psychological safety

Team learning behaviour

Team voice

Complexity leadership

5 IRB Principes:
-1. alertness to failure
-2. reluctance to simplify
-3. sensitivity to operations
-4.commitment to resilience
-5.deference to expertise

-better chance to desired project results
-less defensive behaviour
-decrease of innovation failure

4.CONCLUDING REMARKS

Observations

- Industry 5.0 offers risks and opportunities
  - Risks: technology determines employment, jobs and working in projects
  - Opportunities: human-centricity ensures technology serves people

Observations

- Industry 5.0 offers risks and opportunities
  - Risks: technology determines employment, jobs and working in projects
  - Opportunities: human-centricity ensures technology serves people
- Human-centricity demands that management and industries take humanisation of work seriously and align this (plus sustainability and resilience) with business goals (economic + social progress)

Observations

- Industry 5.0 offers risks and opportunities
  - Risks: technology determines employment, jobs and working in projects
  - Opportunities: human-centricity ensures technology serves people
- Human-centricity demands that management and industries take humanisation of work seriously and align this (plus sustainability and resilience) with business goals (economic + social progress)
- Projectification could benefit from resilient and mindful teamwork

Observations

- Industry 5.0 offers risks and opportunities
  - Risks: technology determines employment, jobs and working in projects
  - Opportunities: human-centricity ensures technology serves people
- Human-centricity demands that management and industries take humanisation of work seriously and align this (plus sustainability and resilience) with business goals (economic + social progress)
- Projectification could benefit from resilient and mindful teamwork
- BRIDGES5.0 and SEISMEC confirm the supporting role of institutions, governmental bodies and collaboration in business ecosystems in the successful shift to Industry5.0

Take away message

We do have the knowledge, tools & instruments to improve human-centricity for work in projects or elsewhere.

We must inform stakeholders that they have a role to play and take responsibility to create human-centric workplaces and project organisations.

Industry 5.0 and human-centricity do not come automatically: action is needed.

Thank you for your attention!

Sources:

Breque, M., De Nul, L., Petridis, A. (2021). *Industry 5.0: towards a sustainable, human-centric and resilient European industry*. Luxembourg: Publications Office of the European Union. https://data.europa.eu/doi/10.2777/308407

Hernández-de-Menéndez, M., Morales-Menéndez, R., Escobar, C. A., & McGovern, M. (2020). Competencies for Industry 4.0. *International Journal on Interactive Design and Manufacturing, 14(4)*, 1511–1524. https://doi.org/10.1007/s12008-020-00716-2

Kuipers, H., Van Amelsvoort, P., & Kramer, E. (2020). *New ways of organizing. Alternatives to bureaucracy*. Leuven: Acco Uitgeverij

Li, L. (2024). Reskilling and Upskilling the Future-ready Workforce for Industry 4.0 and Beyond. *Information Systems Frontiers, 24(4)*, 1021–1038. https://doi.org/10.1007/s10796-022-10308-y

Lovett et al., (2025). Seven recommendations for managing projectification. *Business Horizons ,* 68, 21-32.

Oeij, P.R.A. (2017). *The resilient innovation team. A study of teams coping with critical incidents during innovation projects*. Doctoral Thesis. Heerlen: Open University of the Netherlands. https://repository.tno.nl/SingleDoc?docId=44331

Oeij, P.R.A., Dhondt, S., & Vaas, F. (2025). SMART work design and Modern Sociotechnical Theory: a marriage made in heaven? *European Journal of Workplace Innovation,10*(1), 7-33. https://journal.uia.no/index.php/EJWI/article/view/1395/1191

Oeij, P.R.A. & Lecoeur, G. (forthcoming). Historical perspective on Industry5.0: Lessons from technological revolutions. In: Book publication of BRIDGES5.0.

Oeij, P.R.A., Lenaerts, K., Dhondt, S., Van Dijk, W., Schartinger, D., Sorko, S.R., Warhurst, C. (2024). A Conceptual Framework for Workforce Skills for Industry 5.0: Implications for Research, Policy and Practice. *Journal of Innovation Management, 12* (1), 205-233; DOI: https://doi.org/10.24840/2183-0606_012.001_0010

Oeij, P.R.A., Van Rhijn, G., Van Dijk, W. & Krause, F. et al. (2025). Conceptual framework of Industry 5.0 to study workforce skills (BRIDGES 5.0 deliverable D1.1, version 2 - January 2025). Leiden: BRIDGES 5.0. (Retrieved from: https://bridges5-0.eu/publications/).

Parker, S.K., Knight, C., Klonek, F.E. & Zhang, F. (Eds) (2025). *Transformative Work Design. Synthesis and New Directions*. New York: Oxford University Press.

Warhurst, C., & Knox, A. (2022). Manifesto for a new Quality of Working Life. *Human Relations*, *75*(2), 304-321. https://doi.org/10.1177/0018726720979348

Warhurst, C., Wright, S., Lyonette, C. (2017). *Understanding and measuring job quality. Research report Part 1-Thematic Literature Review*. London: CIPD, Chartered Institute of Personnel and Development.

Website BRIDGES5.0: https://bridges5-0.eu/

Website SEISMEC: https://seismec.eu/