Systems Summit

Robots and humans at work?

A systems perspective on shaping physical work towards Industry 5.0

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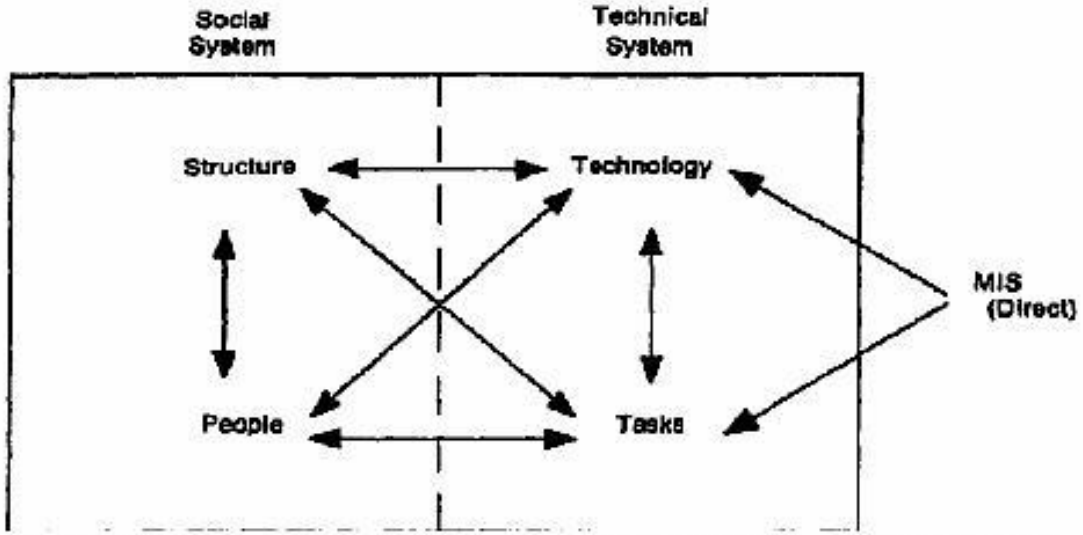




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transdisciplinary research and innovation centre

Socio-technical Systems & Industry 5.0



MIS Problems and Failures: A Socio-Technical Perspective. Bostrom, Robert P.; Heinen, J. Stephen. MIS Quarterly, Sep77, Vol. 1 Issue 3

Building on the foundations of 'Industry 4.0', this concept places **research and innovation** at the service of three core priorities:

- **Human-centricity** – placing the wellbeing, skills, and empowerment of workers at the centre of production systems
- **Sustainability** – enabling circular use of resources and adopting technologies that respect planetary boundaries
- **Resilience** – strengthening the capacity of industry to withstand and adapt to global disruptions

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www.transdisciplinairwerken.nl

What's at stake? Key sectors urgently require **sustainable physical work**

nursing





metal & maintenance

logistics



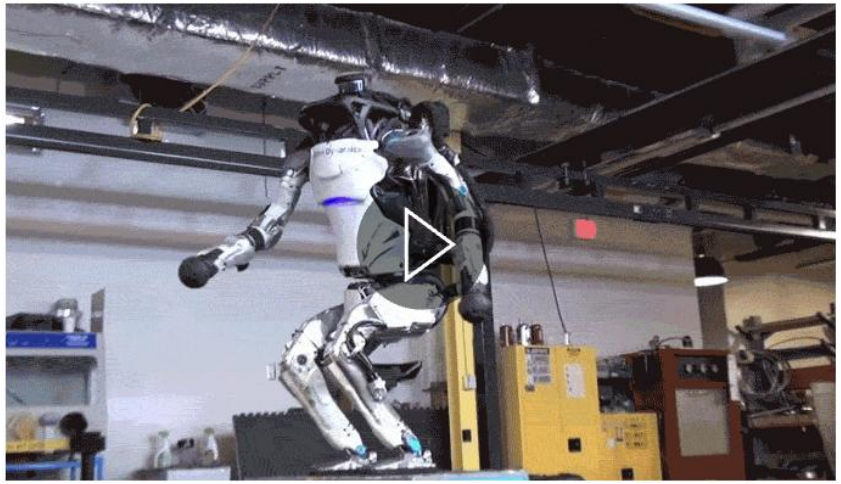


construction & infrastructure

What's the problem? Technology-driven innovation is failing

- Slow (5-10 years) & ineffective (70-90% fail on the work floor)
- Effect on work only studied retrospectively

-> **No focus on shaping attractive, sustainable work**







Technological Innovations

Proof-of-concept

Adoption on work floor

Impact quality of work life?

What are the consequences?

1. Adverse consequences on workers



>400.000 workers
suffer from **physical strain**

2. Adverse economic consequences:



€ 780 million
work-related physical strain
€ 300 million
care costs

3. Adverse societal consequences:



inequality
social exclusion, exploitation

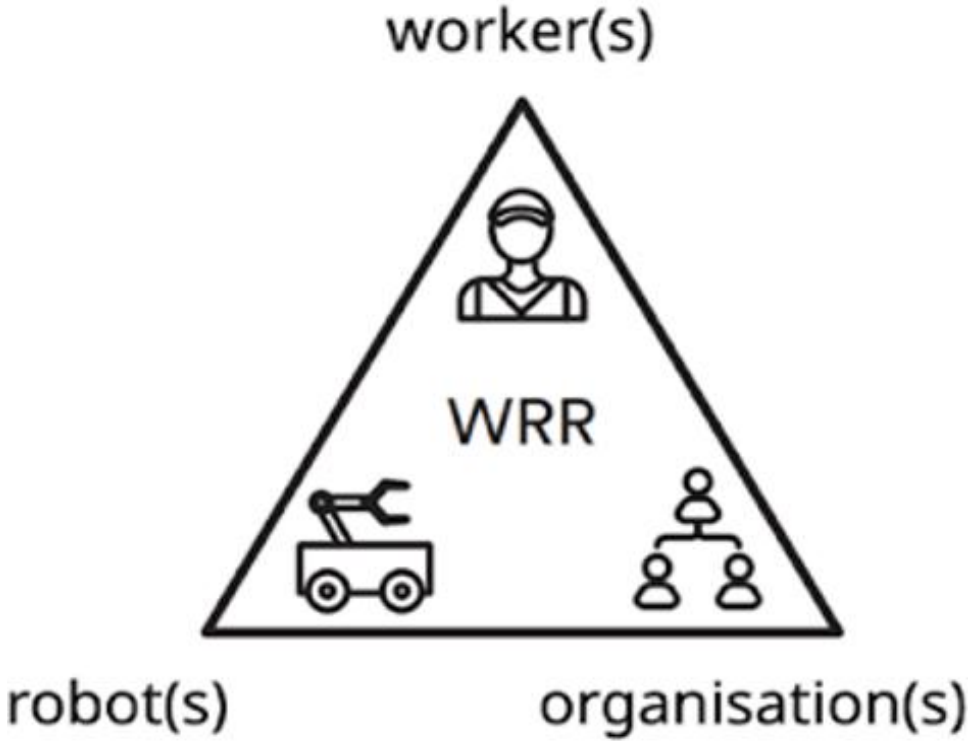
meaningful & healthy
(individual value)

viable
(economical value)

just
(societal value)

Shaping **meaningful, just and viable** future of physical work, with and for workers

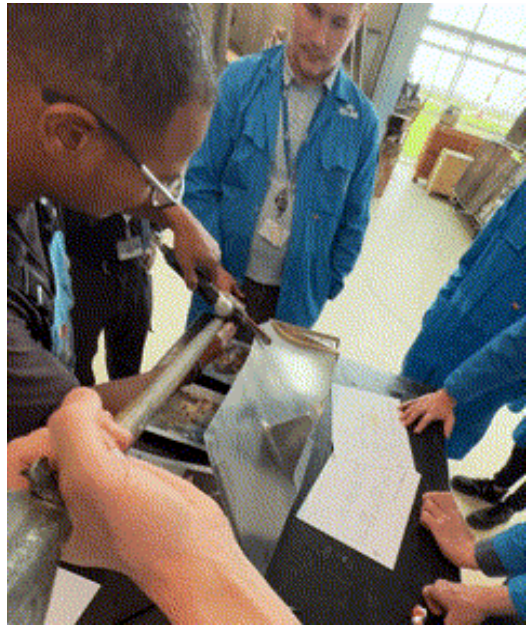
Scientific conceptualisation
worker-robot relations



Approach with and for workers
Transdisciplinary Research & Innovation



How to improve Jairo's heavy physical work?



Involve Jairo!

Shaping **meaningful, just and viable** future of physical work, with and for workers





Outcomes



Jairo's **mechanical** solution



Our collective **robotic** solution

academic outcomes

What is needed for understanding and shaping WRRs ?

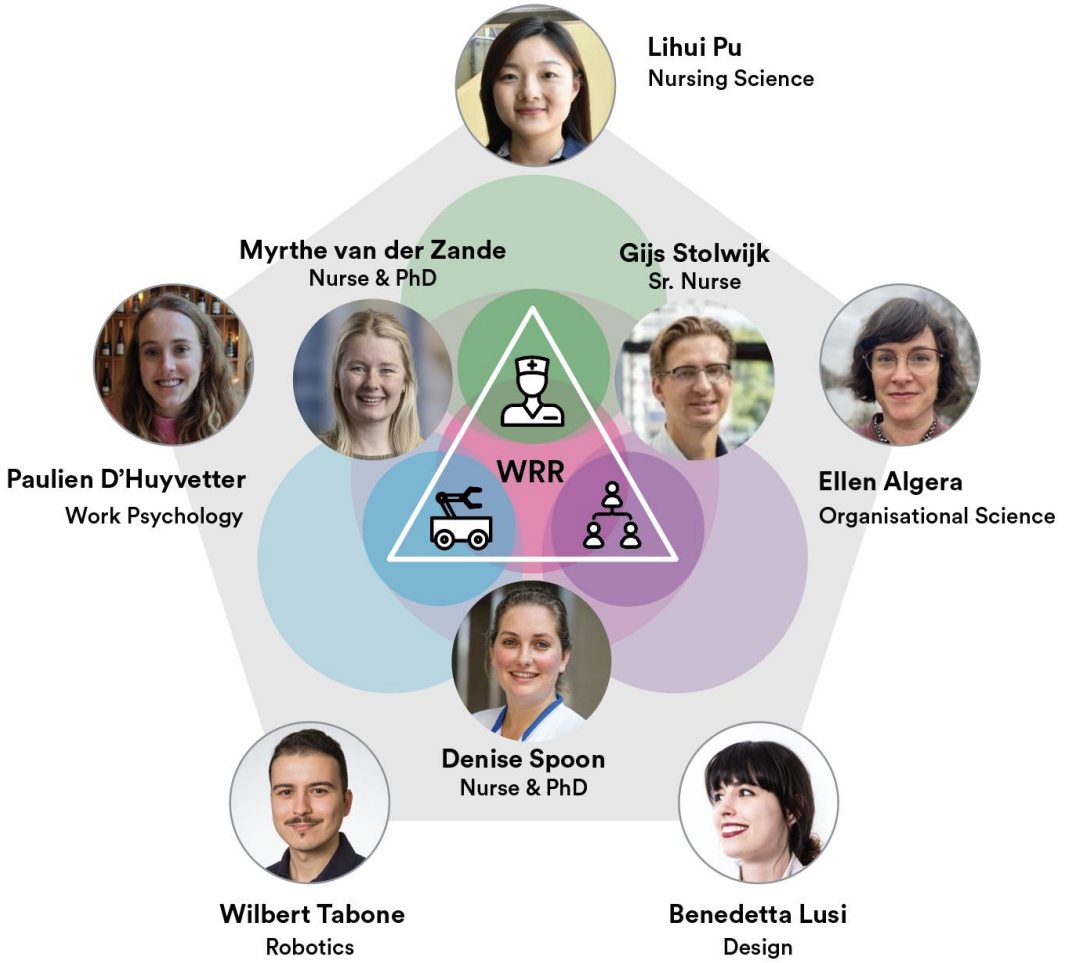
New ways of empowering workers



New ways to co-design future work

New robotic capabilities

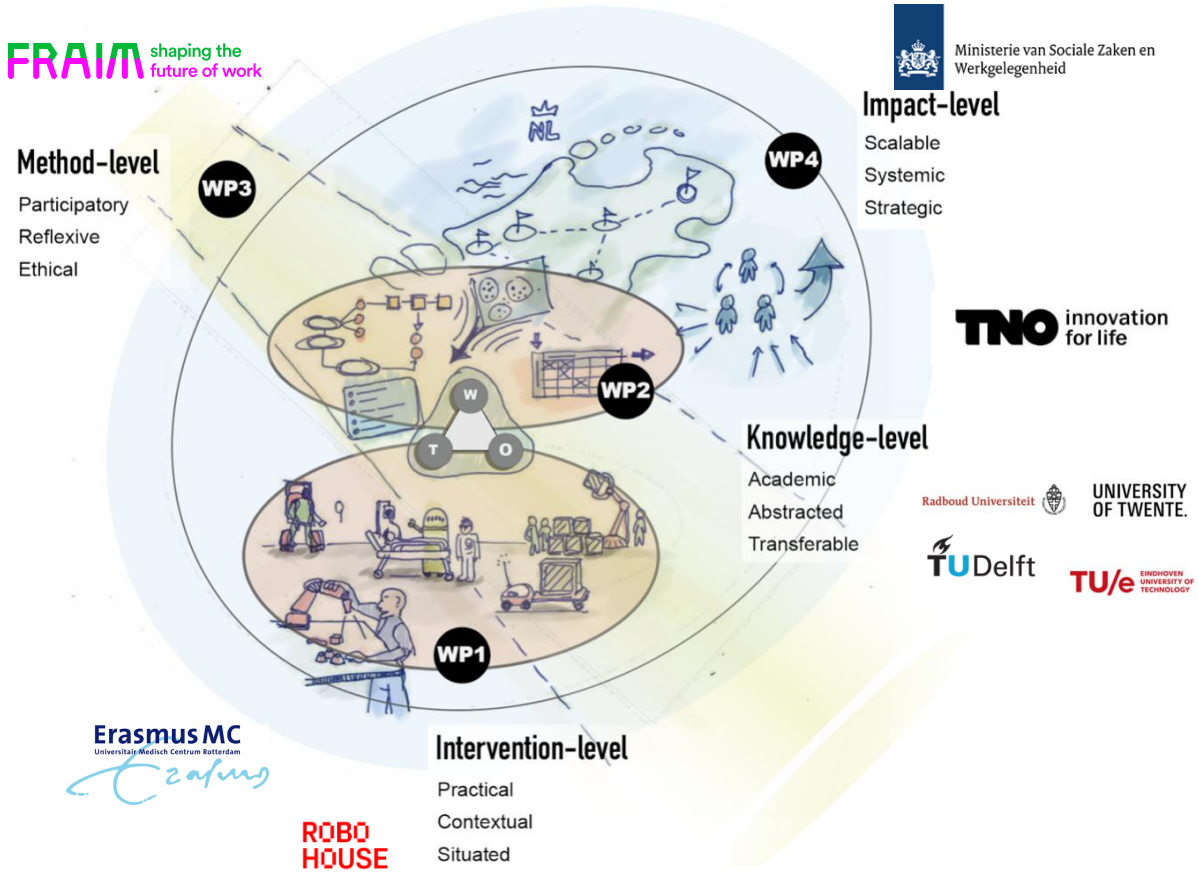
New ways for organising change



Organise critical mass and shared responsibility

2027-2037

"Towards a national centre for shaping the future of physical work" NWO-LTP **(10 years)**



2026-2031

"WerkSprong" (5 years, 30 miljoen)
SZW-EZK Duurzame inzetbaarheidsagenda



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TNO innovation for life
Ministerie van Sociale Zaken en Werkgelegenheid
Ministerie van Economische Zaken

Thank you !

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Transdisciplinary Methodology (WP3) – with and for nurses at Erasmus MC









PARTICIPATORY & TEMPORAL ACTIVITY CONFIGURATIONS

TD TEAM + NURSING LEAD

TD TEAM + ACADEMIC MENTORS

TD TEAM + FRAIM

TD TEAM

TD TEAM MEMBERS + NURSES

SHADOWING

TD TEAM MEMBERS + NURSES

INTERVIEWS

TD TEAM + NURSES + EXPERTS

EMPLOYEE JOURNEY MAPPING

TD TEAM + EXPERTS

OPPORTUNITY IDENTIFICATION

IMPACT vs EFFORT EVALUATION WORKSHOP

FULL NURTURE SYSTEM