KU LEUVEN HIVA

RESEARCH INSTITUTE FOR WORK AND SOCIETY

Technology for workable work

Concepts and tools

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Webinar

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STS RT
SOCIOTECHNICAL SYSTEMS ROUNDTABLE INC.

Outline

Part 1 - Understanding the relationship between technology and workable work / job quality through recent research findings

Part 2 - Explore the use of canvas templates as structured tools to guide workshop discussions on new technologies' effects on work

Part 3 - Learn how hypothetical job profiles (‘Personas’) help assess technology's impact on job quality across diverse jobs

Part 1

Concepts

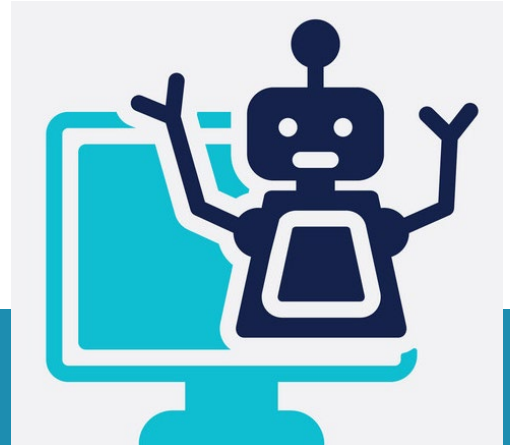
Technostress…

Or technopower?

Workable work

Job Demands

Challenges

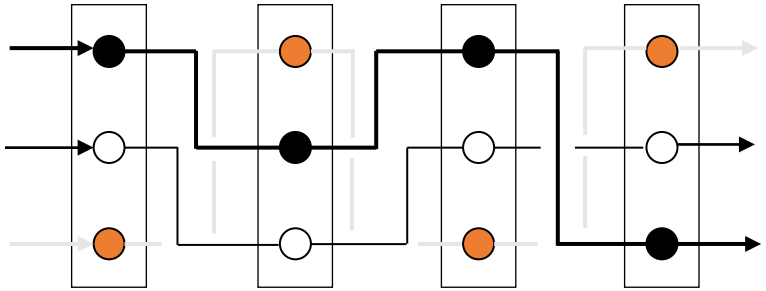


Job Controls

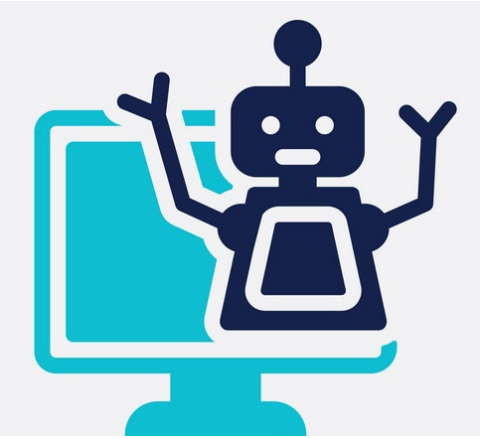
Resources

A matter of organising…

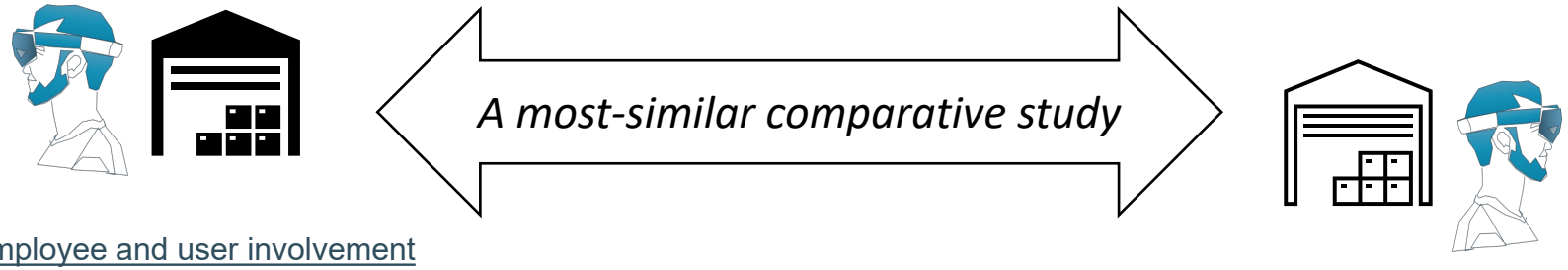
Division of tasks and responsibilities



Place of technology



Employee involvement and work organisation



High rates of employee and user involvement

- w.r.t. **technology**
  - Involvement throughout whole *technology timeline*
    - Design, implementation and use
  - Room for *adjustments*
    - Backup smartphones
    - Wristband for hands-free working
    - Software updates
    - New applications (registering shortages)
- w.r.t. **order-pickers' task & job design**
  - Used to discuss ergonomic improvement (irresp. / tech)
  - Used to discuss task allocation (irresp. / tech)
  - New non-formalized ways of picking ~ job controls ↑

In terms of **workable work**

- HWD deployment *beyond* what was initially anticipated
- Due to the implementation task design was *rediscussed*

Mediocre rates of user involvement

- w.r.t. **technology**:
  - Slightly involved during phase of implementation
  - Largely imposed *as-is*
- w.r.t. **order-picking tasks**
  - Non-formalized picking (parallel ↔ sequential) hindered
  - No considertation of feedback

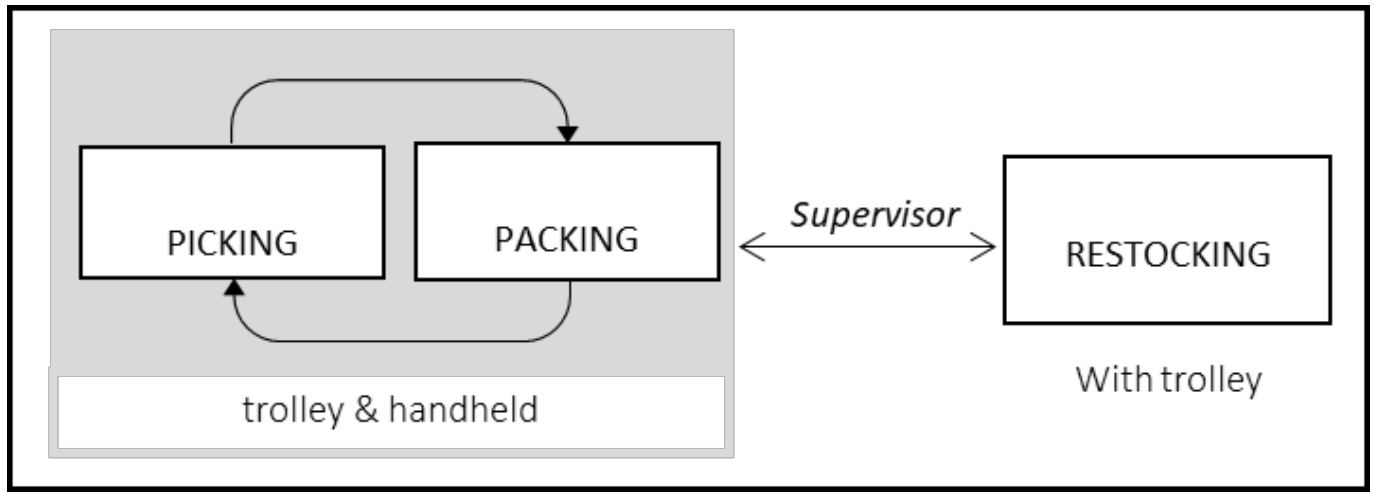
In terms of **workable work**

- Job quality ↓ (drop of job controls)
- Discontinued shortly after implementation

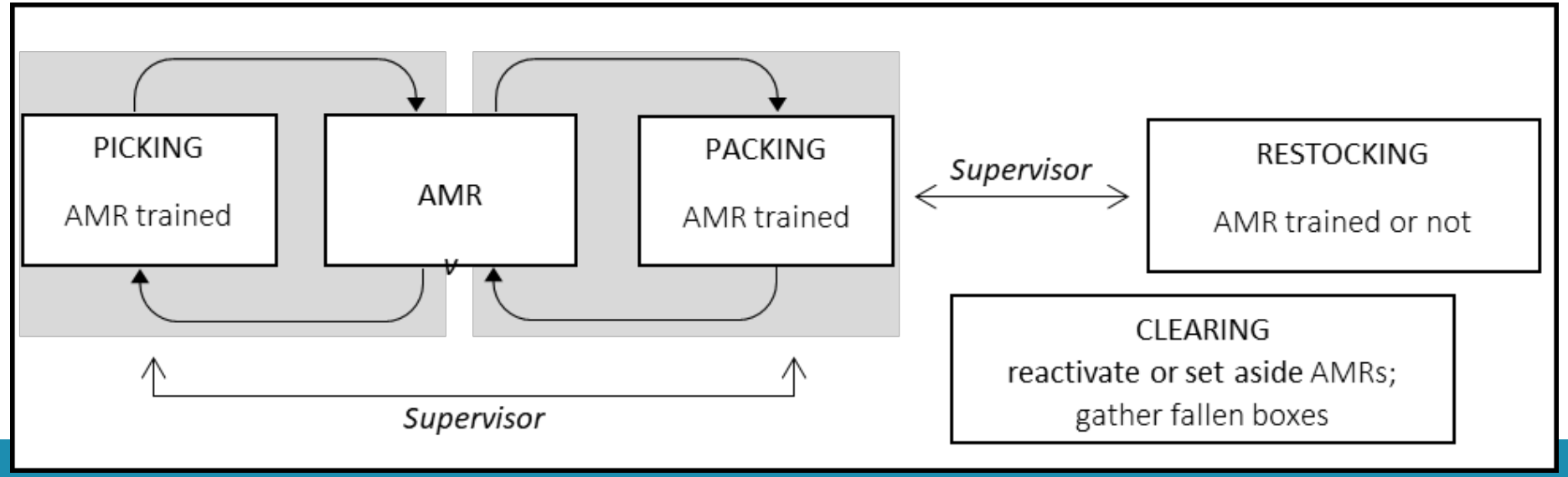
Bal, M., Vermeerbergen, L., & Benders, J. (2022). Putting head-worn displays to use for order picking: a most-similar comparative case study. International Journal of Logistics Management. https://doi.org/10.1108/IJLM-12-2021-0570

Impact on jobs

Before AMRs



With AMRs



Habraken, M., Dessers, E., Berx, N., Pintelon, L. (2022). Samenwerken met cobots: goed nieuws voor de kwaliteit van arbeid? Over.Werk - Tijdschrift van het Steunpunt Werk, 32 (2), 113-121.

Workable work and technology

- Keeping the human in the loop
  - But: employees are more than technology users
  - Acceptance, user friendliness, safety → Necessary but insufficient
  - Not just looking at (moment of) use → Keep focus on the entire job

- Keeping the organisation in the loop
  - Technology gets shaped and is being used within
    - Jobs
    - Processes
    - Organisations
    - Networks and ecosystems

Herrmann, T., Pfeiffer, S. Keeping the organization in the loop: a socio-technical extension of human-centered artificial intelligence. AI & Soc 38, 1523–1542 (2023). https://doi.org/10.1007/s00146-022-01391-5

Conclusion

At a minimum: when introducing technology

- Assessment impact on work process
- Assessment impact on job characteristics (task shifting / enlargement…)

Even better: technology for workable work!

- Technology as an enabler → develop together with work organisation
- In function of needs and risks
- Involve employees (co-creation) & give them control over technology

Do these insights provide valuable approaches for your work with organizations?

Part 2

Workshop canvas

Workshop canvas

- In *companies*: assess impact of technology on business processes, work organisation, and jobs
- In collaboration with an *employement agency*: explore expectations, opportunities and risks among job seekers

Workshop agenda

1st part: trying out the technology

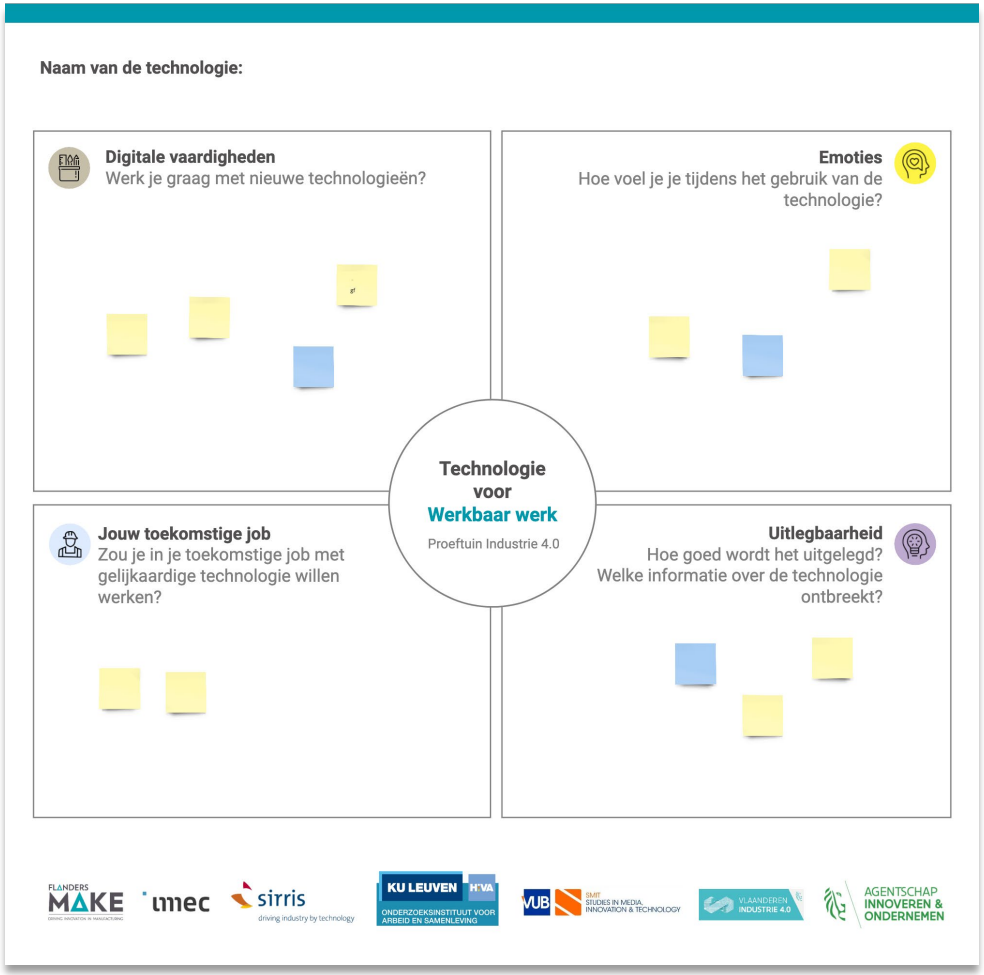
digital work instructions & cobot

2nd part: interactive discussion

Session 3

Interactive discussion – job seekers

- Participants skills
- Feelings about using the technology
- Clarity of the technology
- Impact of the technology on their future jobs



Interactive discussion - companies

Current process

Technology users

Technology requirements

Side effects

Explainability

Future process

Could canvas templates be useful in your own work?

Part 3

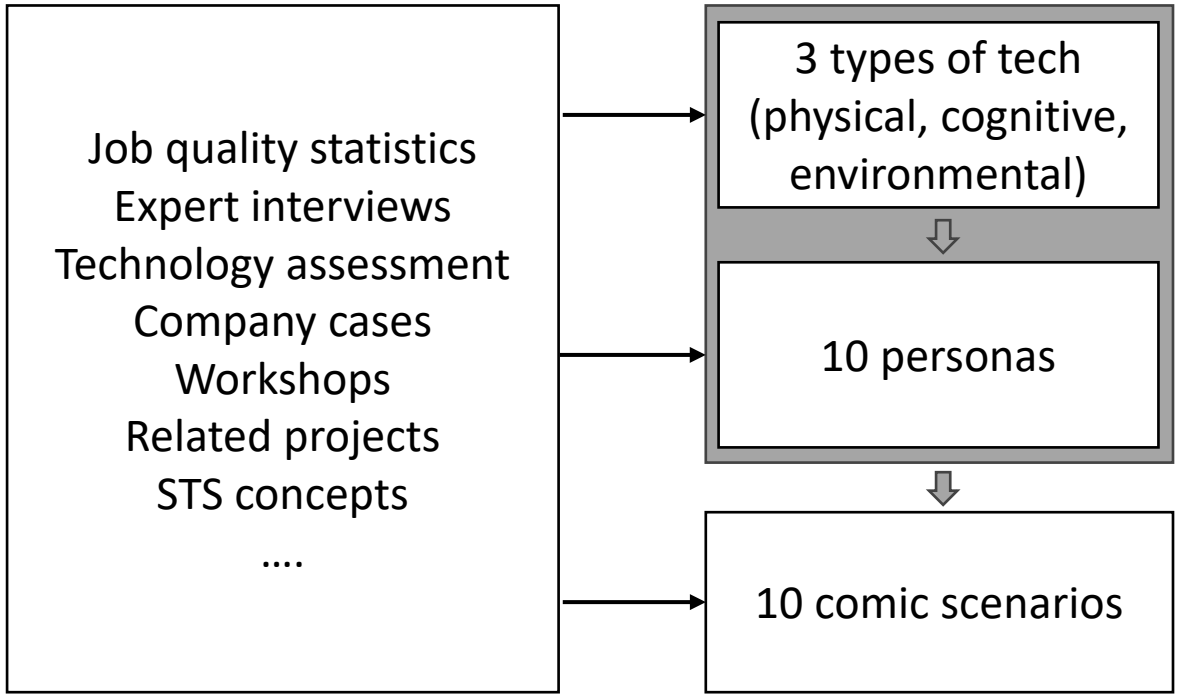
Personas

Personas?

A persona in user-centered design and marketing is a personalized fictional character created to represent a user type that might use a site, brand, or product in a similar way

Living lab: a persona represent the similarities of a group of industry workers (or job seekers) in terms of job quality needs & risks

- Understand and represent job quality needs & risks
- Focused design: tech + org
- Communication: one page comic stories



Dessers, E., Habraken, M., Van Hootegem, G. (2023). Technology for workable work? Developing personas to assess job quality impact of new technologies. Presented at the Organizational Design and Management Conference (ODAM), Bordeaux. https://lirias.kuleuven.be/handle/20.500.12942/720522
Habraken, M., Dessers, E., Van Hootegem, G. (2023). Werkbaar werk: Knelpunten in de Vlaamse maakindustrie. (in Dutch) https://lirias.kuleuven.be/retrieve/700333

Technology	Aim of technology	Persona
Digital work instructions	Reducing cognitive load / improving cognitive development	Kai, age 33, worker in sheltered workshop
Virtual training environment		Robin, age 27, worker
Operator support via noise monitoring		Pascal, age 55, technician
Exoskeletons	Reducing heavy load / improving work posture	Dominique, age 60, worker
Smart manipulator		Yaniek, age 32, worker
Third hand robot		Charlie, age 48, worker
Sensor-base ergonomy monitoring		Alex, age 21, job seeker
Stress monitoring		
Environment monitor (e.g. noise, temperature, …)	Improving work environment	Taylor, age 62, worker
		Manoa, age 44, worker with language barrier
		Nikki, age 35, job seeker

Illustrations by Kris Nauwelaerts

Name: Dominique
Age: 60 year
Job: worker
Sector: industrial bakery

Dominique has had a long career as a worker in a cookie factory. His experience gives him an understanding of the entire cookie-making process, allowing him to work both on the preparation of the cookies and with the finished products. However, most tasks involve physically demanding aspects. For example, he has to manually place 15 kg packs of butter into the mills or load and unload trays of products from the ovens. Due to the years of strain from these tasks, he suffers from back problems, among other issues. Dominique is therefore pleased that he recently took on a side activity as a coach for new employees. This relieves him somewhat from the heavy work, but his main duties still remain in production. Otherwise, he wouldn't know how to deal with the physical complaints he experiences. He is not interested in pursuing education to transition to a completely different, but less demanding, job.

Robin 27 jaar, arbeider

Dominique 60 jaar arbeider koekjesfabriek

YANNICK, arbeider 32 jaar

RAI (Indische achtergrond?) 33 jaar

Illustrations by Kris Nauwelaerts

Taylor, 28 jaar, arbeider

Nikkie, 35 jaar, werkzoekende

Manoa, 44 jaar, arbeidster met taalbarrière

Alex, 21 jaar, werkzoekend.

Overview personas and key messages scenarios

Persona	Need	Technology	Industry	Key message
A1. Kai	Cognive	Digital work instructions	Sheltered workshop/ air conditioning	Maintaining work volume by keeping everyone on board / bringing everyone on board with the help of technology
A2. Robin	Cognitive	AR glasses	Meat processing	Successful technology through participation and feedback, adjusted task package, more variety possible thanks to technology (but it doesn't happen automatically!)
A3. Pascal	Cognitive	Ticketing software / tablet	Furniture	Combining new technology with organizing a direct connection between teams and technicians; importance of training
B1. Dominique	Physical	Exoskeleton	Bakery	Delayed retirement through technology, combined with organizational restructuring; social dialogue is indispensable
B2. Yaniek	Physical	Cobot	Pharma	Closely monitor needs, address monotony of work by task expansion
B3. Charlie	Physical	VR training	Metal processing	Identifying challenges, involving the team in changes, adjusting responsibilities when introducing technology
B4. Alex	Physical (disability)	Cobot / exoskeletons / digital work instructions	Logistics	The importance of training and internships to support reintegration through appropriate technology
C1 Taylor	Environment / physical	Sensoren	Construction	Technology should and can help us to fairly distribute the burdens and benefits of work. Creating sustainable work also means organizing equity
C2. Manoa	Environment / language	Digitale work instructions in multiple languages	Ink production	Removing the language barrier creates room for other tasks and more responsibilities. Involve employees in shaping technology and task distribution
C3. Nikkie	Environment / unemployed	AMR	Warehouse	Jobs become more accessible through technology. Unforeseen effects of technology require adapted work organization

Illustrations by Kris Nauwelaerts

Next steps

- Comics
  - Roll-up banners, website, book …
- STS RT Vancouver
  - Apply personas in design workshops
- Personas in companies
  - Create set of personas based on job quality risk and needs
  - Focused co-design solutions (org/tech)

Could personas be useful in your own work?

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