

SUMMIT

RESEARCH

- Inclusive, Innovative and Sustainable Societies – Some Contributions from Extended Reality

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GOOD HEALTH AND WELL-BEING



4

QUALITY EDUCATION



8

DECENT WORK AND ECONOMIC GROWTH



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INDUSTRY, INNOVATION AND INFRASTRUCTURE



12

RESPONSIBLE CONSUMPTION AND PRODUCTION



IEETA - Institute of Electronics and Informatics Engineering of Aveiro

**Information
Processing
and
Technologies**

**Biomedical
Informatics
and
Technologies**

**Intelligent
Systems and
Robotics**

Intelligent Systems for Human Assistance



What is eXtended Reality (XR)?

- Virtual (VR)
- Augmented (AR)
- Mixed (MR)

Computer mediated reality

Emulating/combining the “physical world”
with a “digital world”



The “ultimate display”:

“... a room within which the computer can control the existence of matter...” (Sutherland, 1965)

Disseminated by Sci-Fi ...

50+ years later:

still far from the ultimate display ...



“Help Me, Obi-Wan Kenobi. You're My Only Hope”
(Star Wars, 1977)

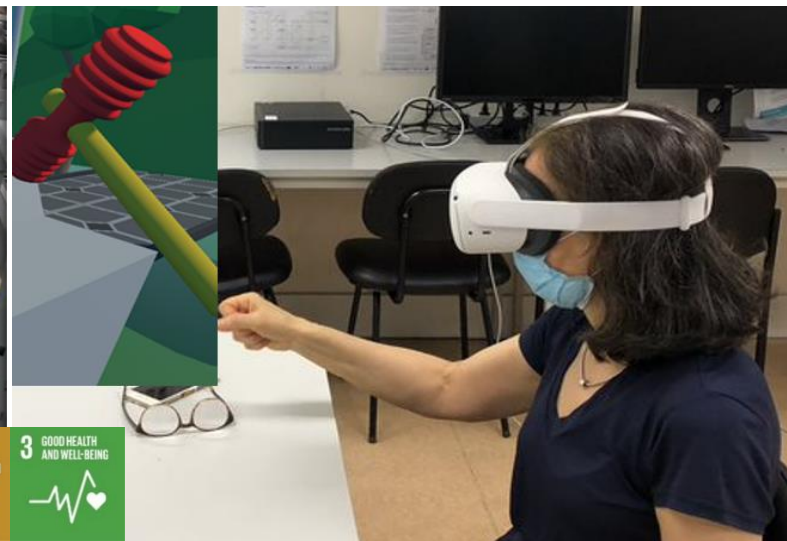
Potential application areas:

Healthcare & Wellbeing

Training & Education

Science & Engineering

Industry & Entertainment, ...



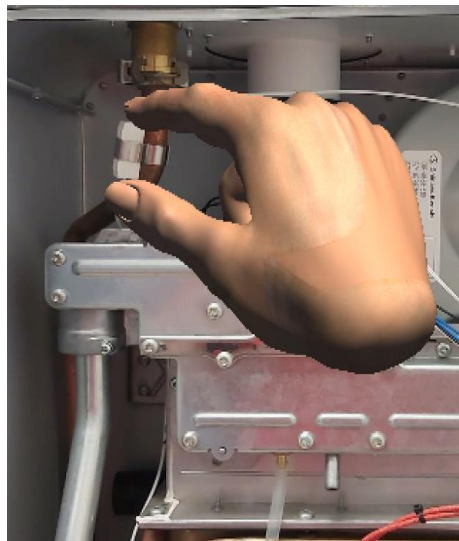
Challenges and Opportunities:

Systems & Devices

Interaction & Collaboration

Evaluation & Standards

Ethics and Social issues, ...



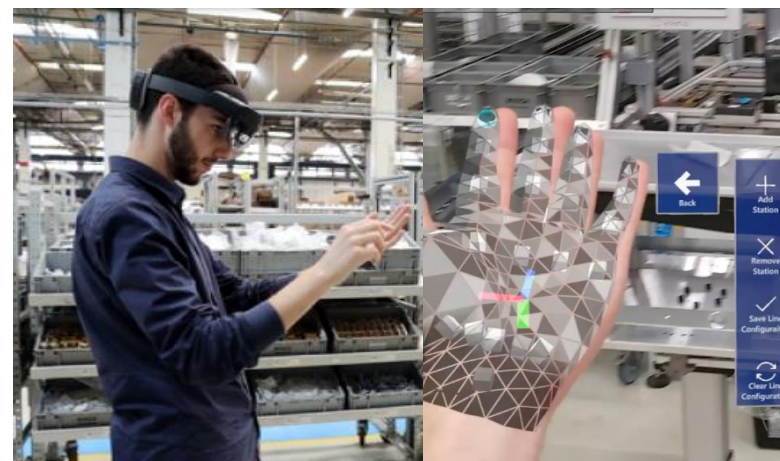
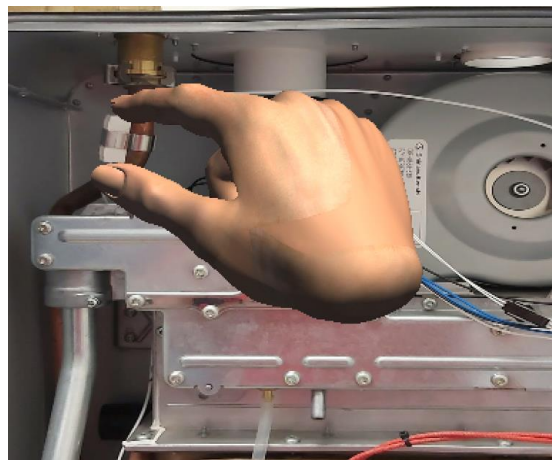
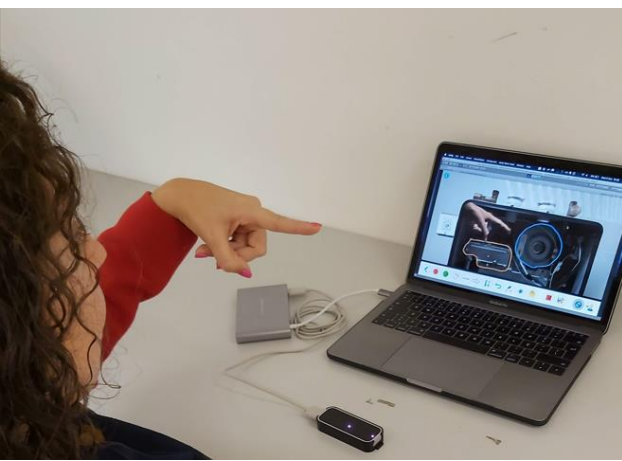
Recent work at VARLab@IEETA

New Methods & Applications:

AR for Collaboration

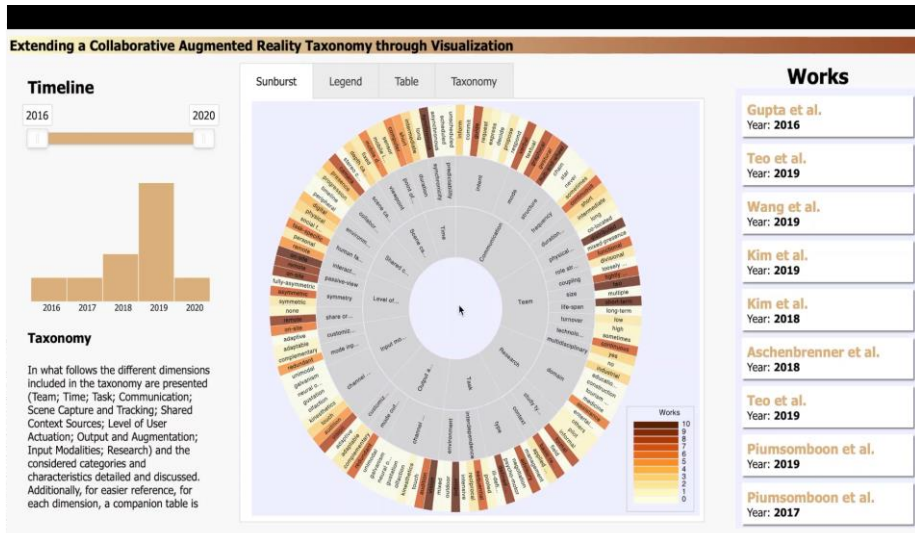
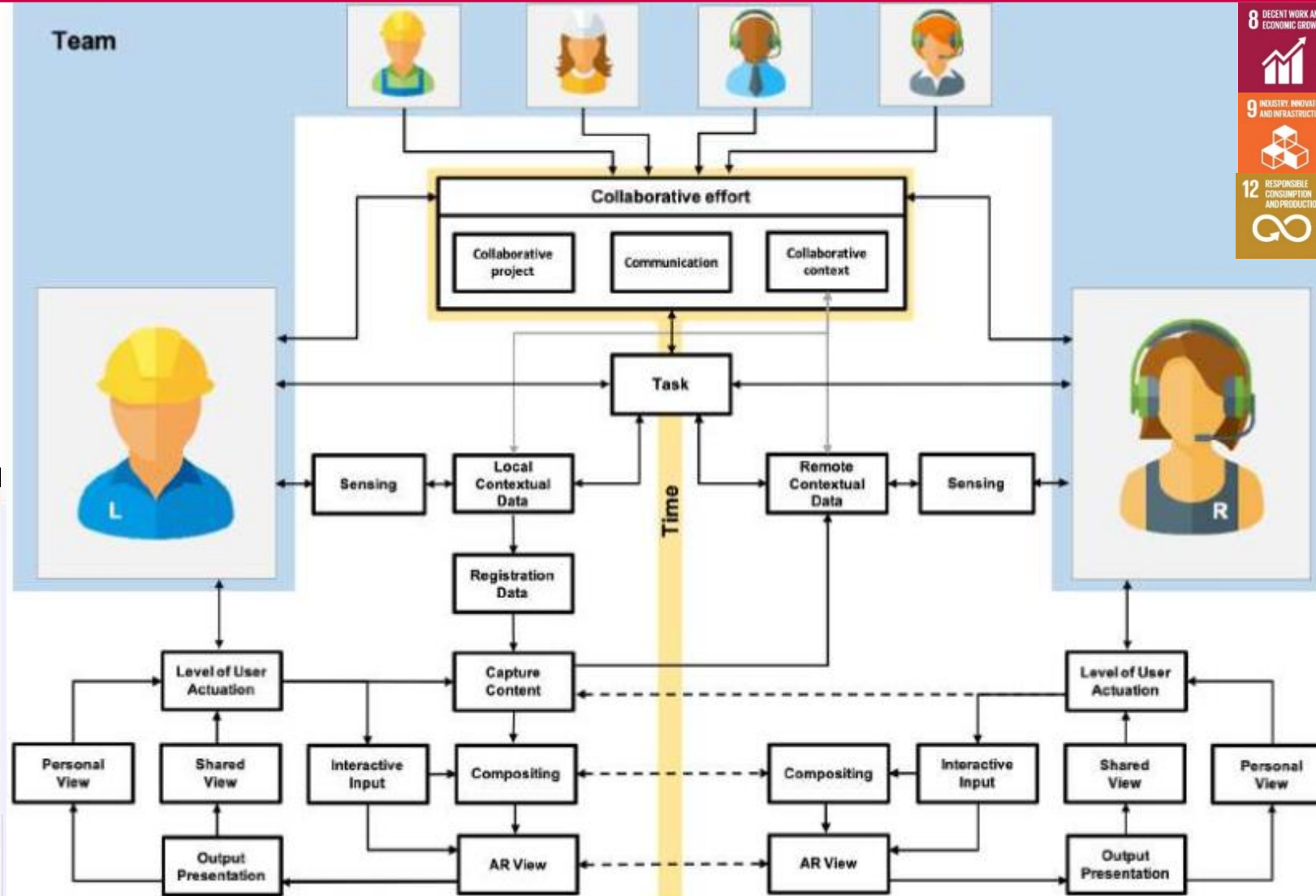
MR for Manufacturing

VR for Rehabilitation

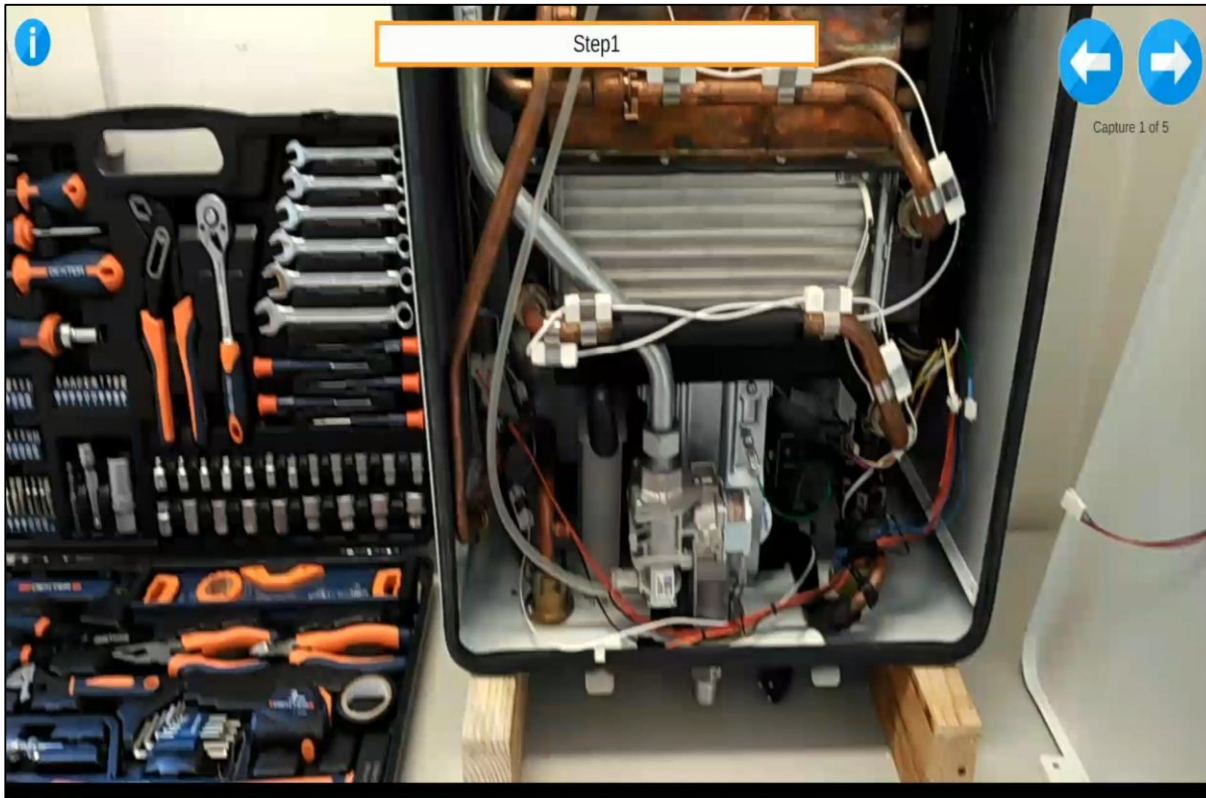


AR for remote collaboration:

Taxonomy and visual exploration of literature



AR for remote collaboration: Maintenance scenario



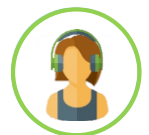
I need some assistance replacing a fan of a new equipment.



Can you provide me with some context for situation understanding?



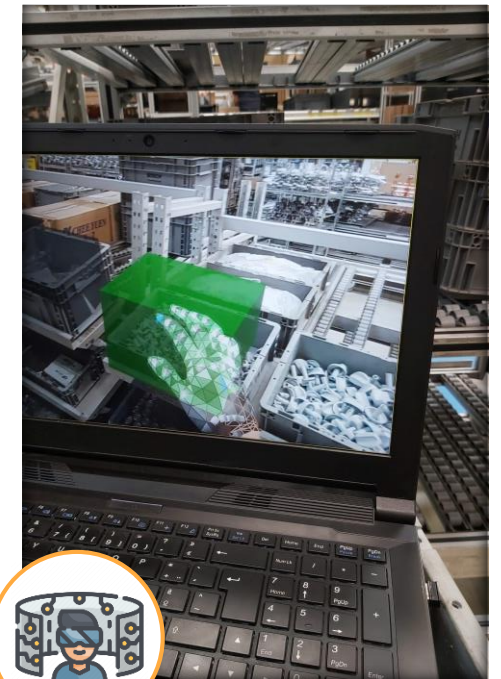
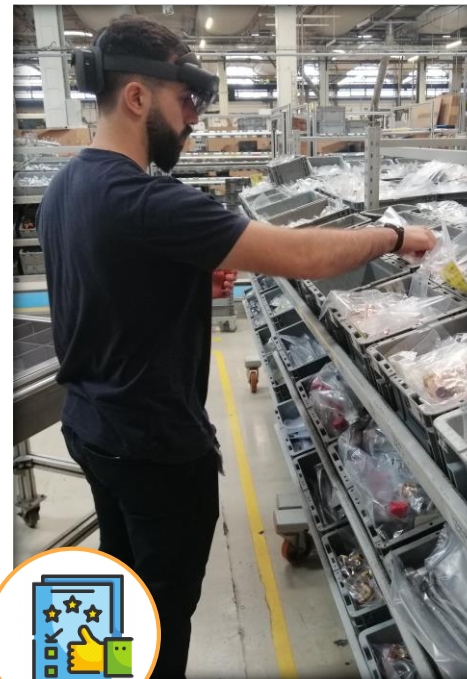
Got it. I'm going to create some instructions to guide you. Hold on!



I think I can manage now. Thanks for your assistance!



MR for manufacturing: Human-Centered Design methodology

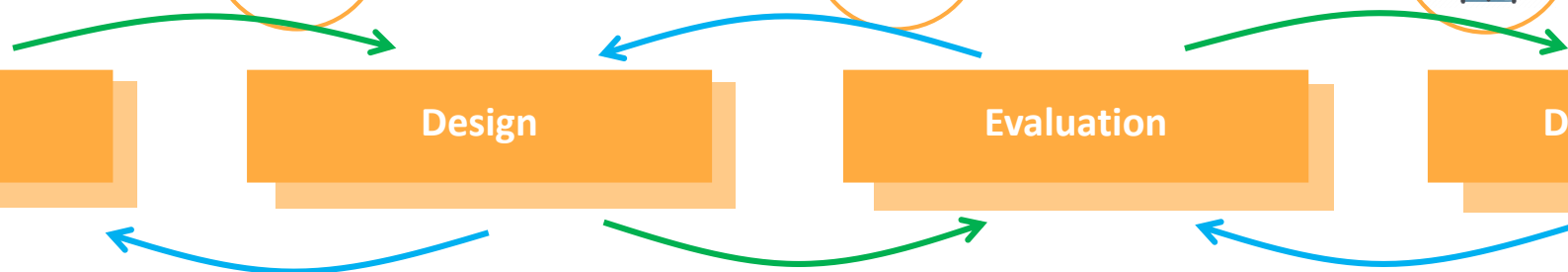


Analysis

Design

Evaluation

Development



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MR for manufacturing: Picking scenario



Picking: Content Configuration



Picking: Content Visualization



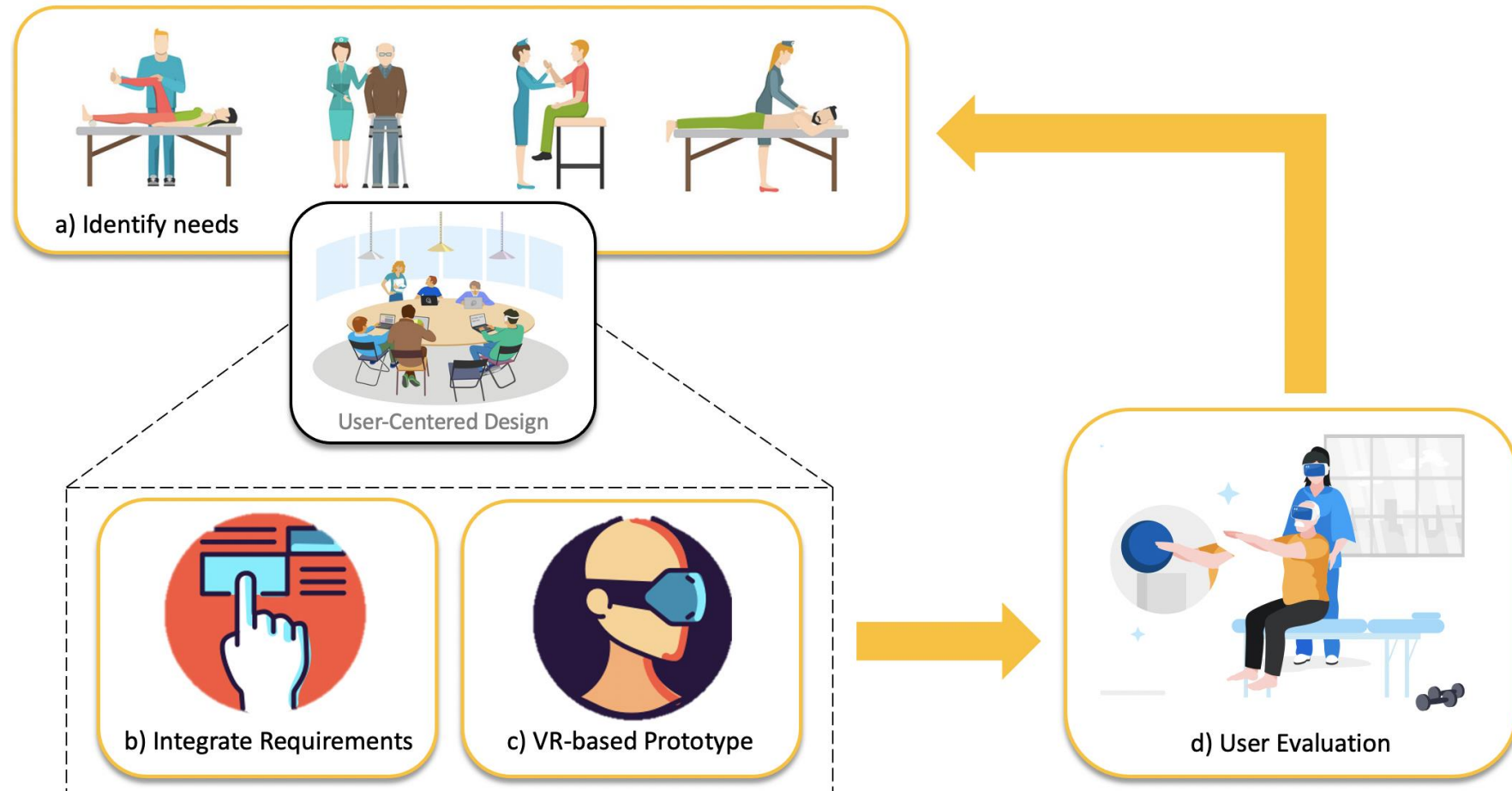
Picking: Evaluation with End-Users



VR for Stroke rehabilitation



VR for Stroke rehabilitation: Human-Centered Design methodology



VR for Stroke Rehabilitation: simulate daily life activities increasing motivation



VR for Stroke Rehabilitation: evaluation by health professionals and patients



SUMMIT

RESEARCH

- Extended Reality:

Excellent opportunities to contribute to Inclusive Innovative and Sustainable Societies

