

VR+ for Manufacturing

How to improve the use of complex and dangerous machinery for the workers in the manufacturing industry of the future

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XR



2Learn

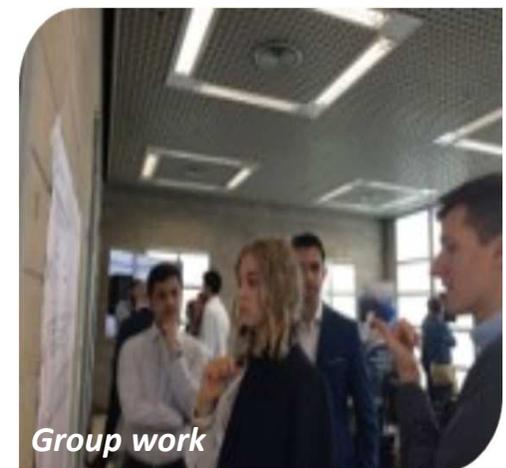
Gap between traditional and future industry

- Traditional manufacturing industry, especially SMEs, is highly penalized since it is barely digitalized.
- Industry often implies the regular purchase and maintenance of *expensive, dangerous* machinery.
- Their usage is also quite difficult due to the security requirements.



Impact of pandemic on industry

- Work has been subject of severe limitations in allowing collaborations and practical experiences.
- Observation, interaction, experimentation with people, but also with physical equipment and products became very complicated.





V-MACHINA approach

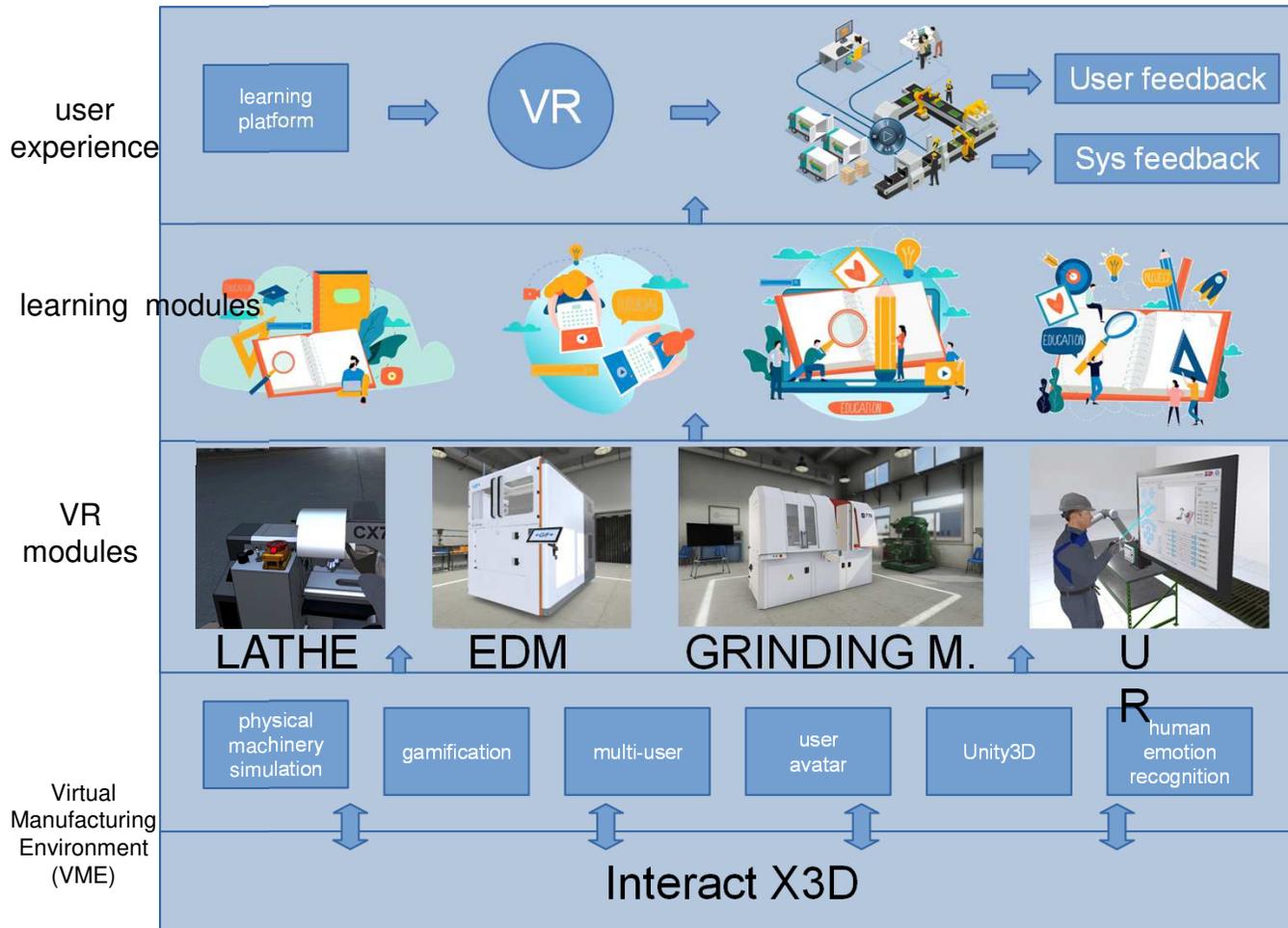
- A Virtual Reality (VR) – based collaborative environment will allow:
 - responding to the current challenges, and overcoming the limitations of purely digital collaboration
 - increasing the resilience of the manufacturing stakeholders (especially SMEs) w.r.t. pandemic risks
 - re-imagining a future with more (remote) collaboration and less need to travel and commute
 - putting the human at the center of the human-machine collaboration



VR as mitigation

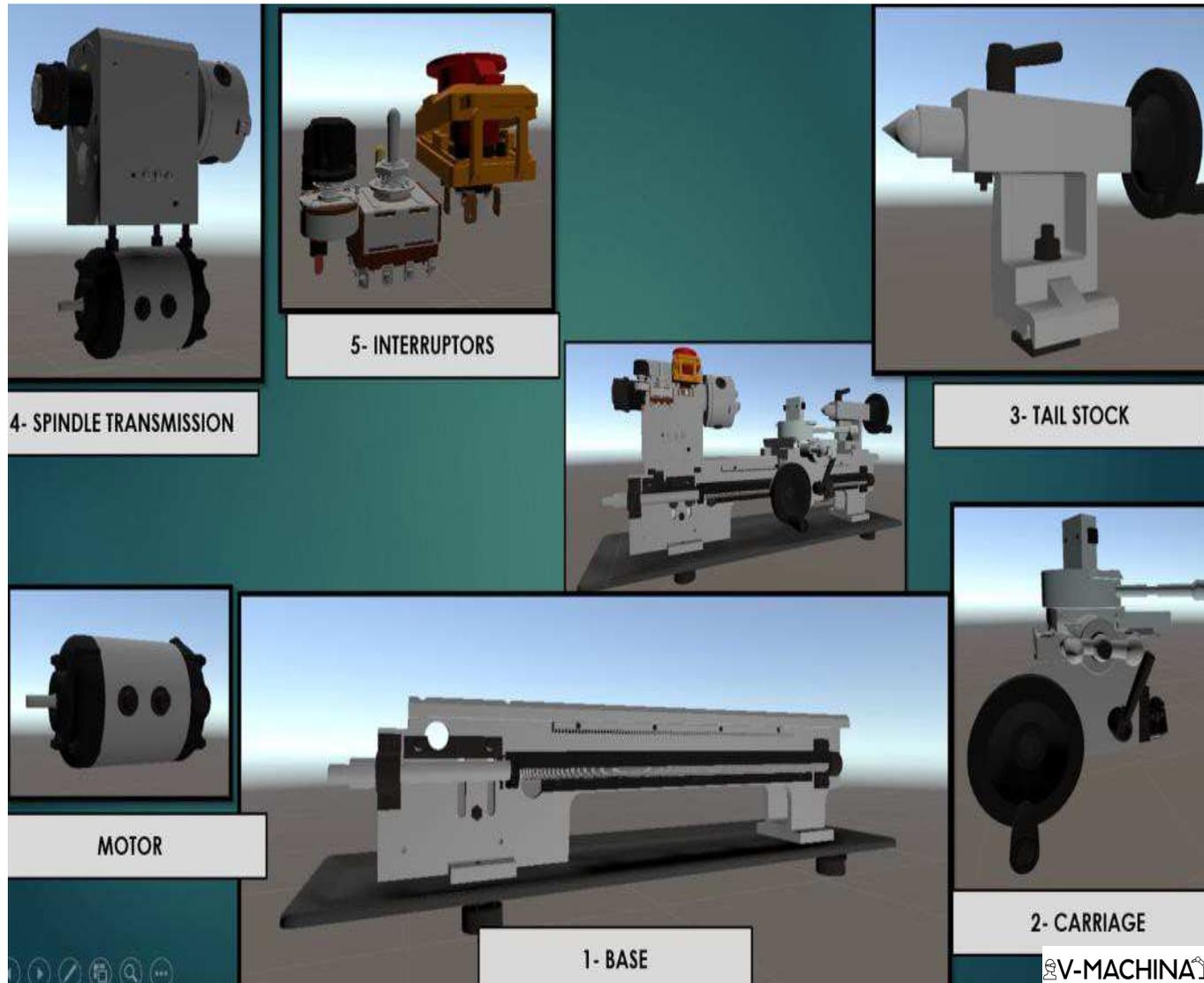
- Practical activities can be performed remotely by means of VR-based digital twins of the required physical instruments:
 - Workers can interact with a digital twin of selected machinery, equipment, products, environments via commodity VR headsets
 - Multiple users (practitioners, apprentices, expert users, etc.) can work together by sharing one same virtual environment over network. Reducing travels and feeling of social distance
 - The technology is now mature enough for real deployment: as confirmed by the first adoptions in the industrial and business fields, and by the growing availability of VR-based solutions
 - Activities within the virtual environment can be easily monitored and analysis can include emotions, fatigue, stress and other factors

VME: VR for digital work in manufacturing



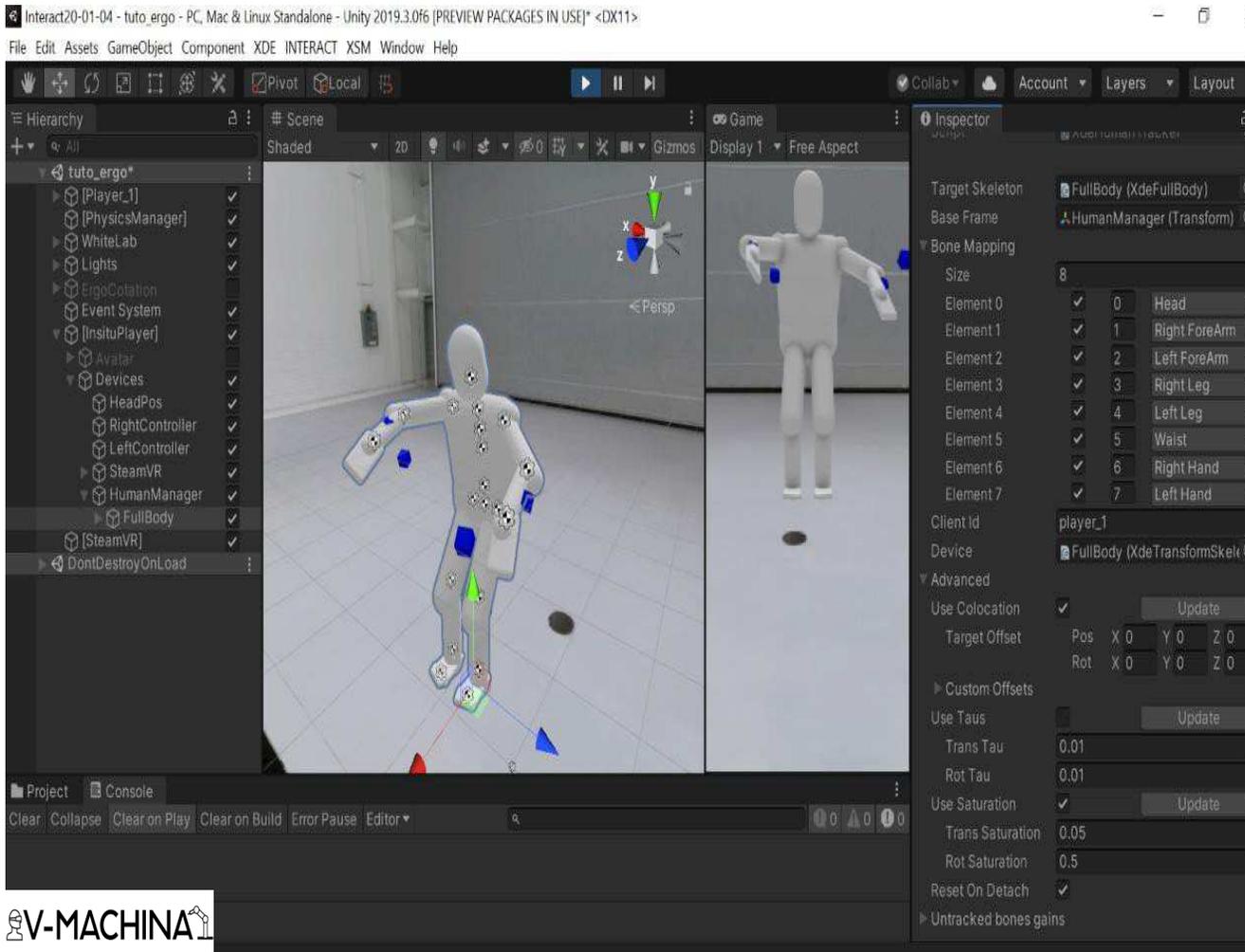
The Virtual Manufacturing Environment (VME) solution aims at further developing the VR platform for the simulation of manufacturing machinery

VME: VR for digital work in manufacturing



A digital twin reconstruction of a lathe machine, where people can collaborate with by wearing a VR headset using their computers and human factors can be captured

VME: VR for digital work in manufacturing



People are represented in the virtual environment via avatars that project the physical characteristics of the user for a more realistic, personalized interaction

VR4ALL: Lowering some of the barriers that affect digital industry



- **WORKING4ALL**, Indicates the easy modelling of machinery by means of the instruments provided by the VME



- **ACCESS4ALL**, Points to the possibility of offering a tailored experience via the VME, without any gender and diversity discrimination



- **FEELING4ALL**, Encompasses the inclusion of emotions into the human-machine interaction, thus paving the way for an unprecedented virtual experience

VR4ALL: Lowering some of the barriers that affect digital industry



Democratization of VR simulation
Resilient machinery practice and usage
A simple mean for evaluating the implications of machinery adoption (e.g., for SMEs)
User tailoring experience, with no gender and diversity discrimination, also for managers (see WINNING)
An approach allowing monitoring and analysis of activity recognition, user behaviour, physiological status and well-being at work



Thanks

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