Best practice

for use of AR in VET

and on-the-job training

leading maintenance
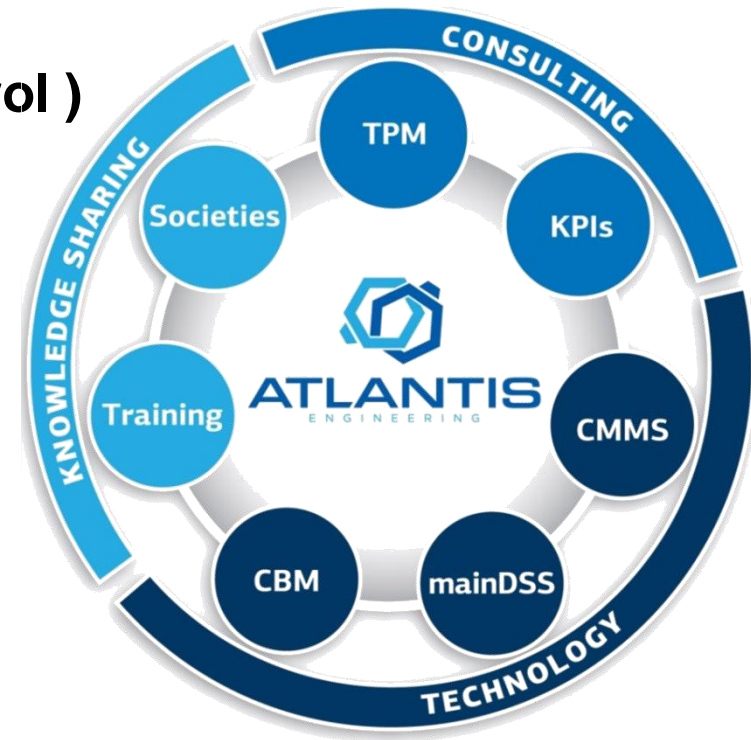
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Activities overview

- **Technology (**CMMS, CBM & DSS → Industry 4.0**)**

- **Consulting (**TPM, KPIs, Quality Control **)**

- **Knowledge Sharing**

  - **Training, Workshops, Certifications**

  - **Maintenance & Technology Forum**

- **R&D**

  - **Member in associations**

  - **15 years of research projects (>10 national, >10 European)**

Member of / Participation in

Workforce Generations

- **Different needs and points of view…**

- **About 1/3 of workforce from each of the first three generations.**

Name	Baby Boomers	Gen X	Gen Y or Millenials	Gen Z
Born in	1940-1959	1960-1979	1980-1999	2000-2019
Age by 2020	80-61	60-41	40-21	20-1

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From the **dlearn** survey

- **AR and VR** not very well known. Need for more information and tailored training on how they can be applied in education and showcase possibilities and implications in case of adoption (costs, methodologies, skill needed etc.).

- **Work based learning and apprenticeship**: key practice for VET courses success. Difficulties in implementation, not linked necessarily to the economic conditions. Use of ICT may ease the adoption of these measures and improve VET offer.

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- **SatisFactory is a European project (Horizon 2020-GA636302) that enables communication among factory actors, either at their workplaces or on the move, using wearable and adaptive devices such as AR glasses.**

- **Bring novel interaction and collaboration technologies to the shop floor, improving overall working experience and thereby increasing workers' productivity.**
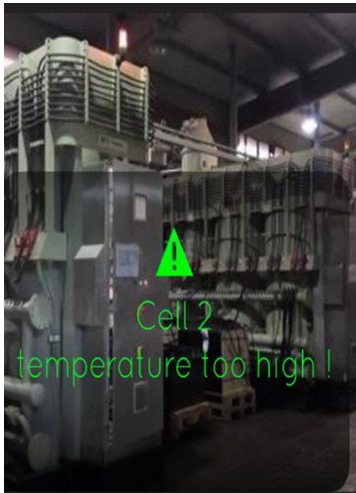
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- **Curiosity regarding professional applications of augmented reality and wearable technologies is growing.**

Danger detection

Logistics

Remote Maintenance

On the job training

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- **Interested in teleservice <u>automotive</u> and <u>packaging</u>.**

- **Focus on the «on the job» training comes from <u>metal working</u> and <u>biomedical</u> industries above all.**

- **Growing interest in <u>insurance field</u>, in attempt to equip insurance adjusters with devices capable of video recording and live streaming from scenes of accidents.**

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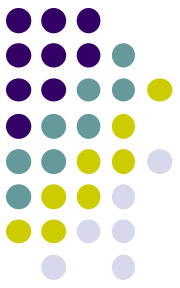
- **How we do it:** <mark>Operator on shopfloor</mark>

<mark>Remote desk operator</mark>

<mark>Company Network</mark>

- **Workers on the shop floor can:**

  - ➤ **talk VOIP & share their PoV with desktop operators using dashboard**

  - ➤ **visualize data and documents shared on the company cloud**

  - ➤ **perform conformity check, edge recognition (AR glasses videocamera)**

  - ➤ **picking, indoor navigation and more…**

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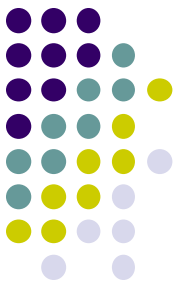
- **How we do it. Marker based AR training (1min 14 sec)**

Marker-based AR Training in CPERI Shop Floor
BSC5.2 Reactor Load Sequence

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- **How we do it. Markerless AR Operating Procedure**

AR OP Presentation Tool
Purpose and features

The AR OP Presentation Tool is a multi-device software running on Mobile Devices, AR Glasses and more. It grants factory workers and other workmen the possibility to learn or follow job procedures using:

- Pictures
- Audio
- Video
- Interactive 3D Models
- Augmented Reality Content

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Best practice for use of AR

- **How we do it. Markerless AR Operating Procedure**

AR OP Presentation Tool
Purpose and features

Using the AR OP Presentation Tool you can easily consult interactive procedures when you're involved in:

on-the-job activities

simulated environments

The target applications of the tool are:

> Training

> Assembly

> Maintenance

> Planned Activities

> Emergency Situations

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- **How we do it. Markerless AR Operating Procedure.**

  - **Inside the Procedure there are Operations, divided into Steps.**

  - **8 types of Actions (assemble, disassemble, act, check, measure, fill in information, move, wait).**

  - **5 types of relations (consecutive, contemporary, indistinct, repeated, conditional).**

Remove CR82162102 tool from wrist CR82341403

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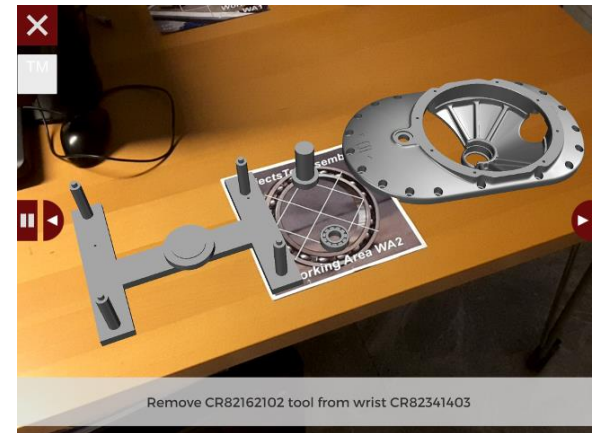
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- **How we do it. The simple User Interface**

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- **How we do it. 3D content**

3D content is based on interactive 3D models and animations that show you the way the task is to be performed.

You can interact with the animation and view the model and the actions from any three dimensional point of view.

Take cover reducer wrist CR82341403 and place it on the proper equipment on bench

1   2   3

time

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- **How we do it. AR content**

Augmented Reality presents the 3D content and animations mixing them up with the images of the surrounding environment.

Throught the device camera or the smart glasses you can see the 3D virtual model aligned and overlapping the real world images.

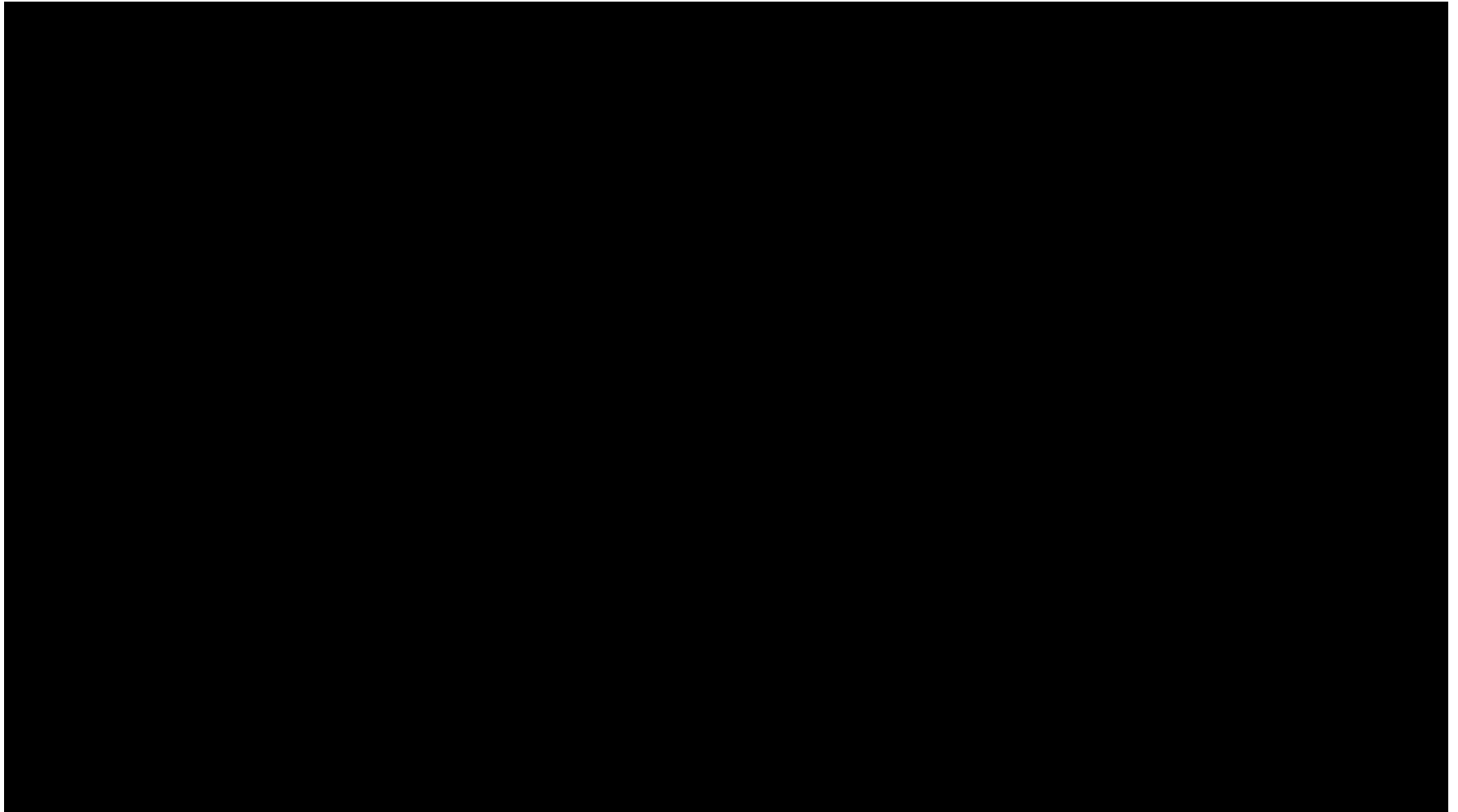This allows you to have a more precise description of how to perform the task.

The AR+ content can be activated automatically by target images or predefined elements in the surrounding environment.

Target image in the real world environment

Virtual 3D animation aligned with the environment

Take cover reducer wrist CR82341403 and place it on the proper equipment on bench

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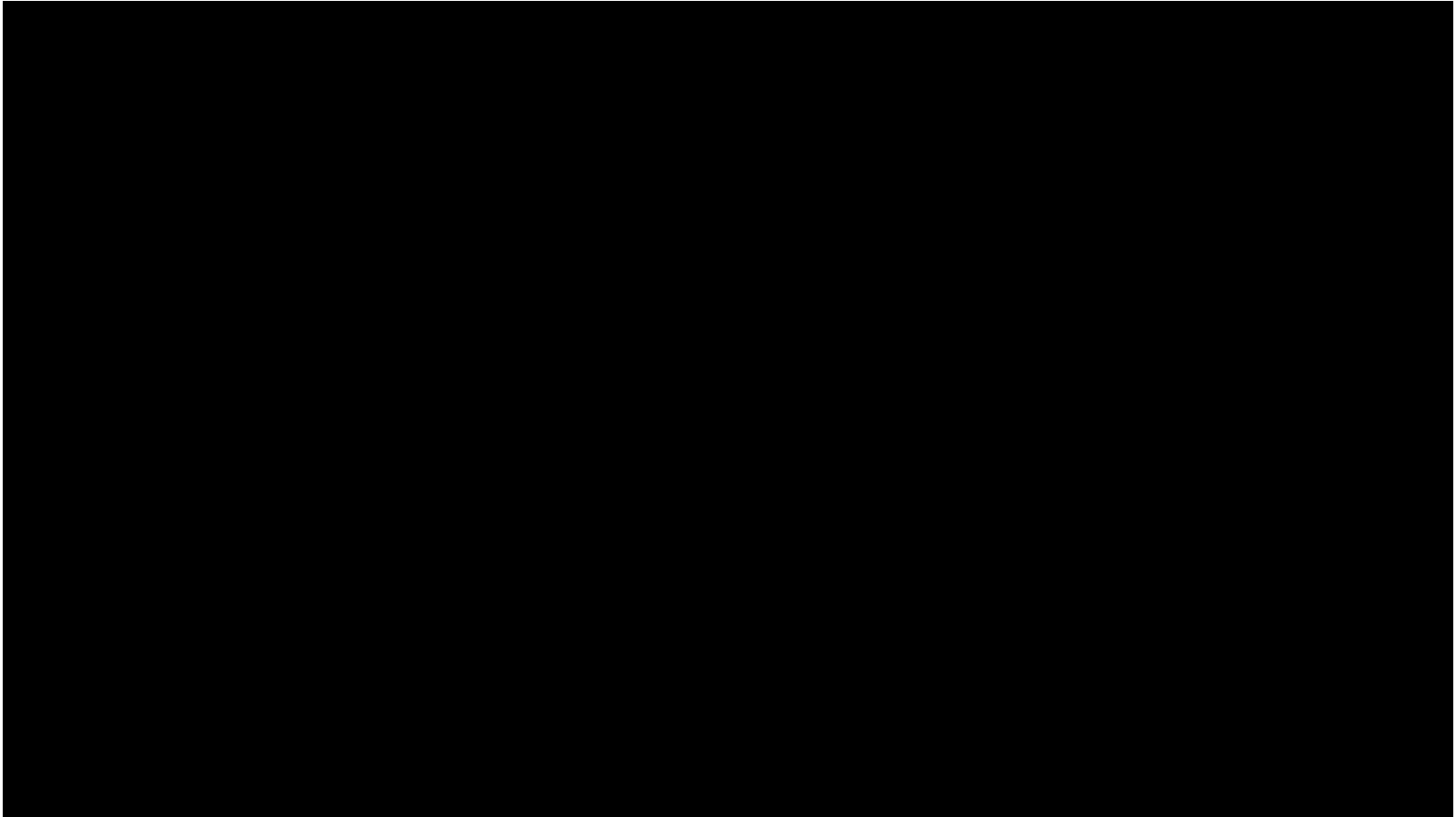ENGINEERING

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- **How we do it. Object Recognition System (2min 24 sec)**

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- **How we do it. The worker point of view (1min 35 sec)**

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Thank you!

Questions?

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