ICAMP

CONFERENCE 2024

LEARNING FACTORIES FOR ADVANCED MANUFACTURING IN EDUCATION

14-15 MAY

OSTERTAG event Centre
Aalen, Germany

Co-funded by the European Union

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LCAMP's approach to the Learning Factory

14-15 MAY

Unai Ziarsolo

LCAMP

Learner Centric Advanced Manufacturing Platform

The LCAMP project aims to support and empower regional Advanced Manufacturing Centres of Vocational Excellence (CoVE) to become more resilient, innovative and better equipped to train, upskill, and reskill young and adult students to successfully face the digital and green transitions.

In the context of LCAMP you will find from the development of skills and competences to their provision; in addition to the design of learning pathways, micro-credentials, active methodological approaches, articulation of services and innovation for SMEs.

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ACTIVITIES

LCAMP platform for Advanced Manufacturing aims to be a digital one-stop-shop for accessing all services, data and information produced during the life's project:

A skills and jobs observatory on Advanced Manufacturing

Building an observatory on advanced manufacturing tendencies from a VET perspective.

An open innovation community

A community of best practices to articulate applied research actions that underpin the activities of the CoVes.

In cooperation with industry, the Vocational Education and Training sector and regions.

A Learner centric training for Advanced Manufacturing

Developing teaching and learning content on Industry 4.0 -specific qualifications, skills assessment, a database of I4.0 specific courses and micro-credentials, integrated learning pathways tool for LLLs and develop and provide micro- credentials for new and existing Industry 4.0 specific qualifications.

Advanced Manufacturing learning factories

Factory labs for advanced manufacturing training (in VET).

Collaborative Learning Factory (CLF)

COLLABORATIVE LEARNING FACTORY

SME – VET connection

- Create a catalogue of training and offer them to SMEs in all partner countries related to the ADMA framework and transition model.
- Develop a support framework for SMEs to accelerate their digital and green transformation

LCAMP's approach to the Learning Factory

LCAMP Collaborative Learning Factory

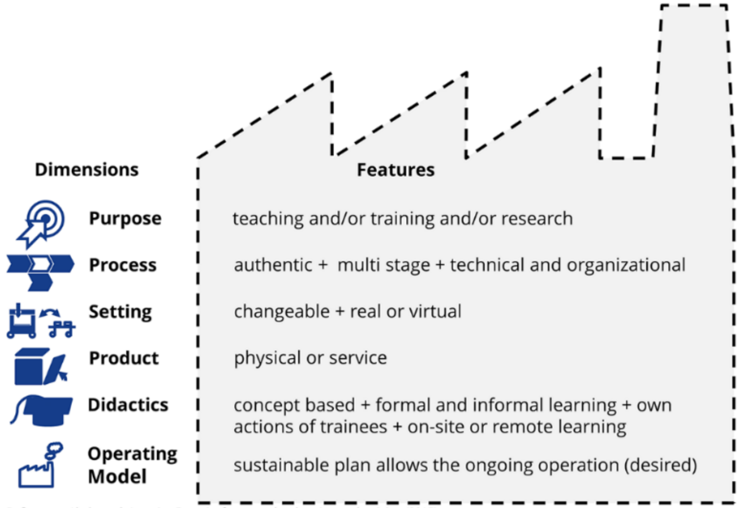
Learning Factory

Physical environment with learning purposes that recreate the entire value chain to produce a product with the closest similarity to reality.

General features

- A semi-industrial learning environment that allows the use active hands-on learning methods
- Allows integration of I4.0 technologies and infrastructures in education facilities
- Multiple disciplines co-work in the same LF
- Enables to recreate real work-organizational situations with a systemic perspective
- Enables the collaboration between geographically separated VET centres

LF EXAMPLES



Dimension given by IALF to describe LFs.
Source (Abele E. et al., 2015).

Source: Smart production Lab at FH Joaneum, AUT

Source: KIT, Karlsruhe, Germany

Source: Arena 2036, Stuttgart, Germany

Source: MADE, Italy

LCAMP's approach to define a LF

1 Define User

Students from:

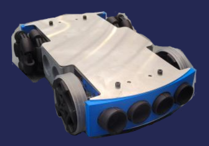
- Production management
- Mechatronics
- Design of products and processes
- Automation and robotics
- Industrial IT
- Others…..

2 Technological Solutions

- IoT infrastructure, communications
- Automation
- Lean manufacturing, work organization
- Data analytics and exploitation, IA,
- Digital assistance technologies, Digital twins, VR/AR solutions
- Sustainability
- Eco design, product life management

3 Define the CLF product

- Specifications
- Technical documentation
- Functionalities



4 CLF process & operative

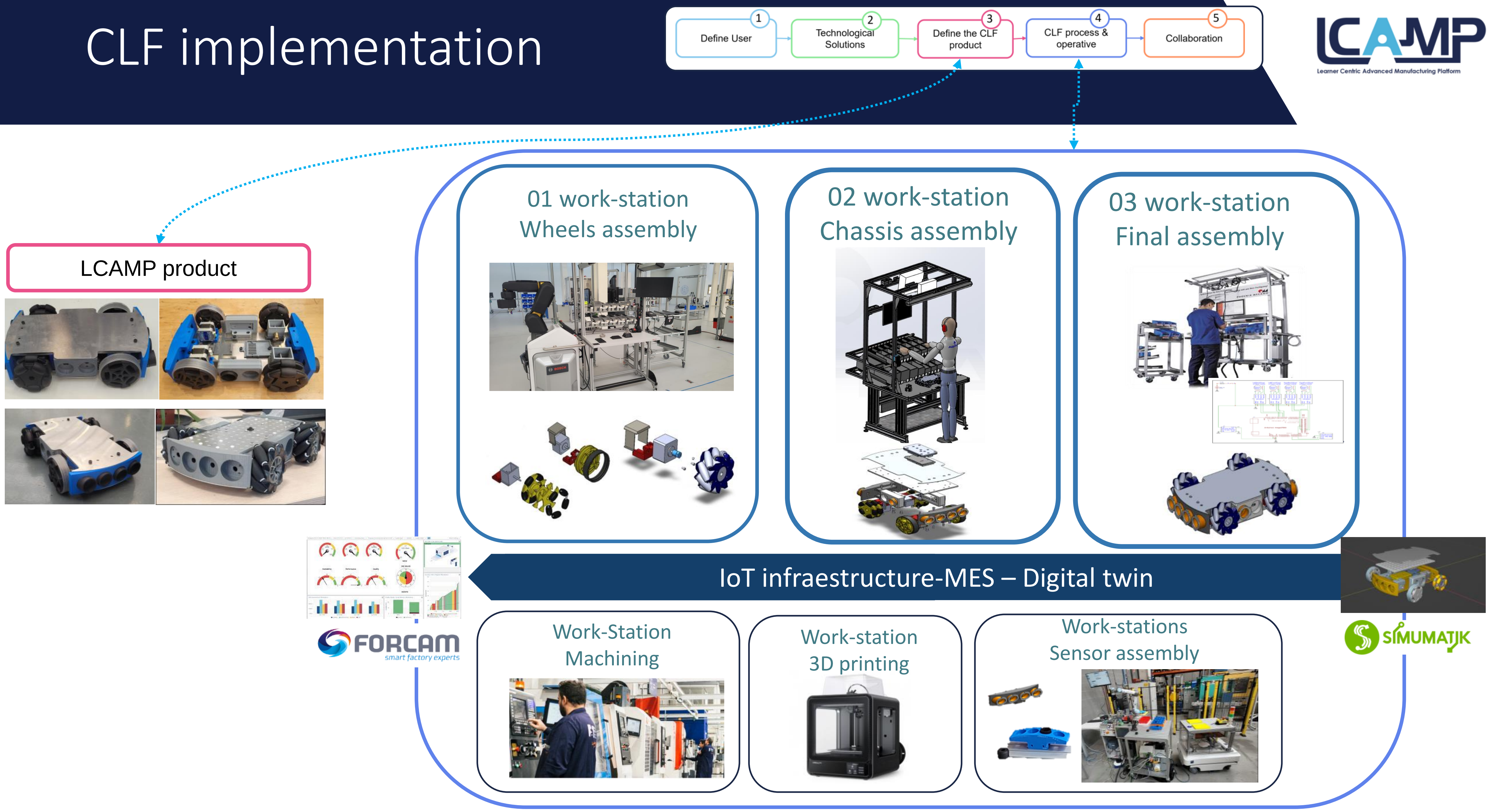
- Nº of Workstations
- Lay out
- Manufacturing systems
- Work organization
- Operative

5 Collaboration

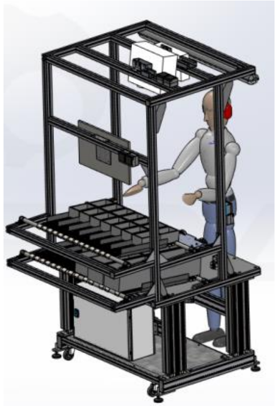
- Interdisciplinary courses
- Regional collaboration
- International collaboration

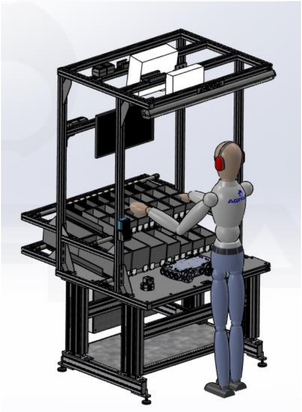
6 Learning activities, courses, microcredentials

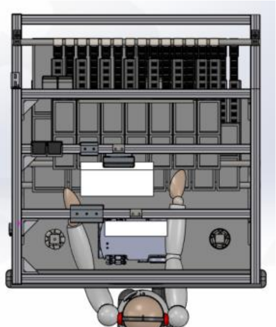
CLF implementation



Assisted assembly work- stations





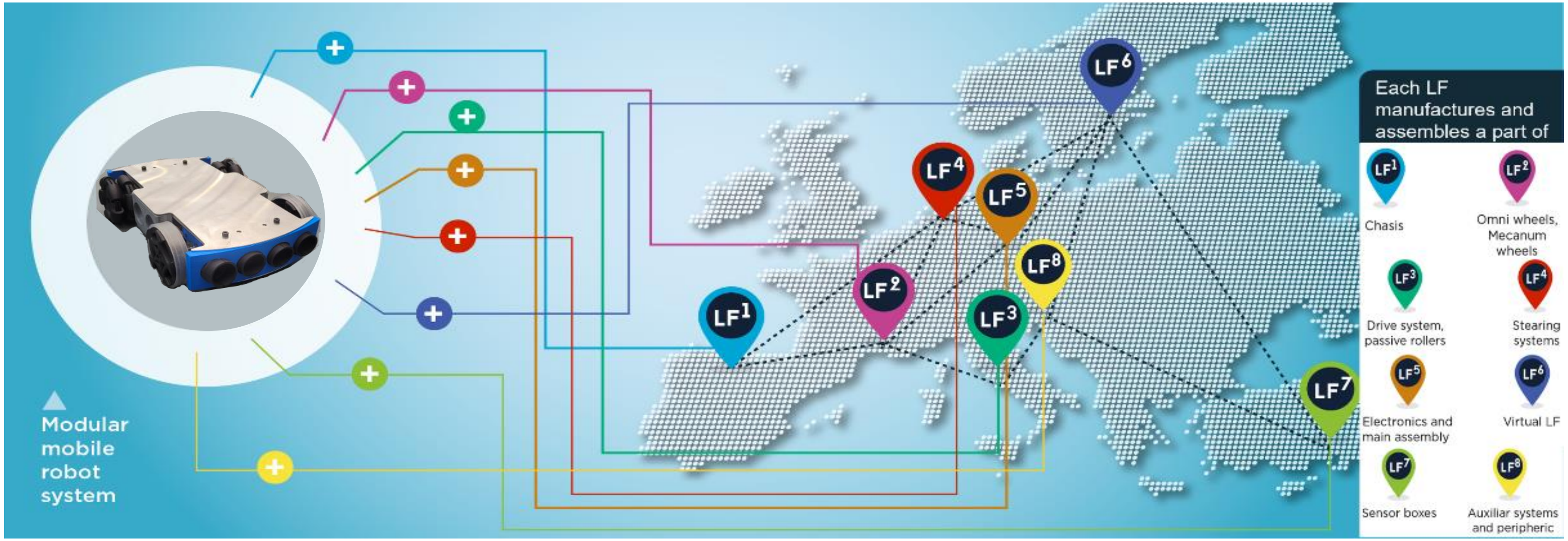


LCAMP

Learner Centric Advanced Manufacturing Platform

Collaboration

- The LCAMP **Collaborative Learning Factory (CLF)** create links among regionally distributed labs.
- In the CLF, the product is subdivided into sub-products which can be produced in LFs located in different regions. Partners decide if they either manufacture and assembly all the sub-products or they ship some parts from other partners.
- LFs are connected and the manufacturing and assembly data of sub-products will be traked and monitored. To this purpose a common operational model is being defined.
- The virtual version of the CLF (product and process) will be developed
- Members of the LCAMP alliance will have access to all the data and output through the LCAMP platform.



Opportunities for VET centres

Support for the creation of LFs

- All documentation generated available in the platform
- Tools To set up LFs.
- Access to the repository of material

Collaboration

- Co- work
- Connection to the CLF network after the LF is launched
- Inter-centre Collaboration Projects
- Challenges Based Learning projects among international students
- Mobility of students

PUBLICATIONS

- RESEARCH ON THE ROLE OF LEARNING FACTORIES IN VET EDUCATION (June2023)
- MORPHOLOGY OF THE LCAMP COLLABORATIVE LEARNING FACTORY (Dec 2023)
- GUIDELINES FOR THE IMPLEMENTATION OF INDUSTRY 4.0 TECHNOLOGIES IN LEARNING FACTORIES AT REGIONAL LEVEL (Dec 2024)
- LF TOOLKIT FOR VET: MATURITY MODEL AND SAT TO IMPLEMENT LFS (dec 2024)

LCAMP ALLIANCE

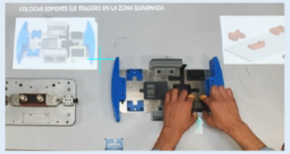
SUMMARY

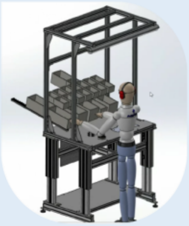
LCAMP
Learner Centric Advanced Manufacturing Platform

INTERDISCIPLINARITY- COLLABORATIONS

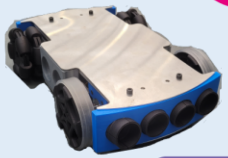
LFs

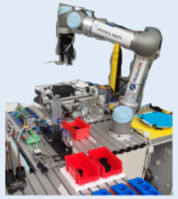
- LF Miguel Altuna LHII
- LF Tknika
- LF DHBW
- LF CMQ
- LF MADE
- LF CNG
- LF GEBKIM
- LF TCMB
- LF Camosun





CLF





STUDENTS

- Production management
- Design in manufacturing
- Industrial automation and robotics
- Mechatronics
- Machining
- Sustainability

Tech. Set ups

- IoT infrastructure, communications
- Lean manufacturing, work organization
- Automation
- Digital assistance technologies, Digital twins, VR/AR solutions
- Eco design, product life management
- Sustainability

LABS ADAPTATION & METHODS

COMPETENCES-SKILLS

Thank you

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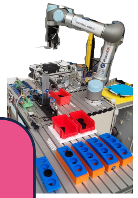
Interdisciplinarity- Collaborations



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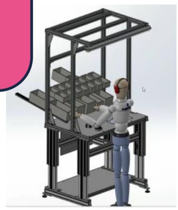

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Labs adaptation & methods

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Competences-skills

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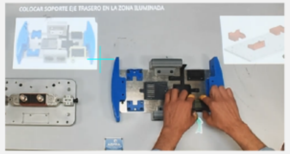

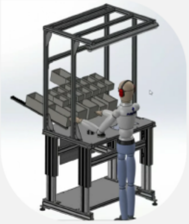

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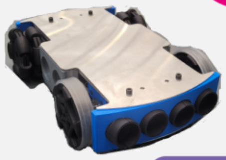

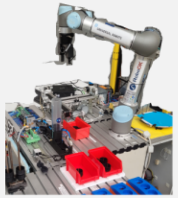

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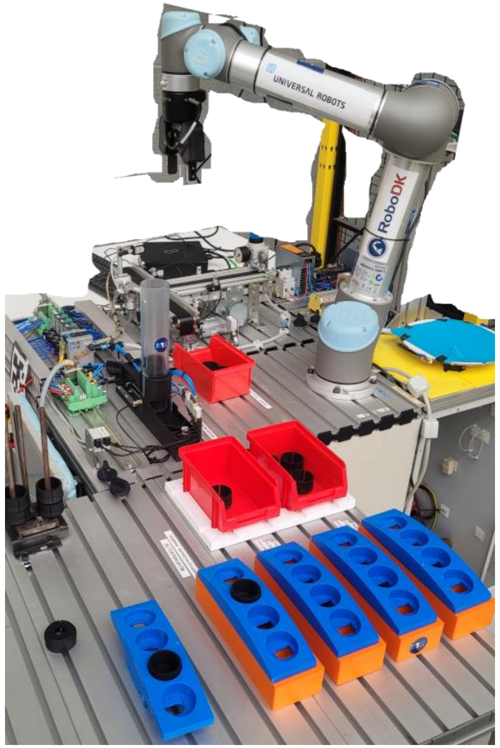
LABS ADAPTATION & METHODS

COMPETENCES-SKILLS

LCAMP

Learner Centric Advanced Manufacturing Platform

ADD DT & MES



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