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Supporting the Ukrainian Tech Ecosystem



XR2LEARN



E-RISE



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Mantra.

Supporting Digital and Green Transformation
of Manufacturing SMEs

MANTRA connects projects, people, and ideas.

We are building a European community of manufacturing innovators and leaders committed to transforming how SMEs grow through digital, green, and social innovation. Through collaboration, mentoring, and shared success stories, we help SMEs adopt digital tools, circular models, and inclusive practices to strengthen Europe's resilience.



From vision to impact



NETWORKING



COMMUNITY

Portfolio of innovative Projects and innovators

Hear the voices from our community leaders in:



**Green
Transformation**



**Digital
Transformation**



**Social
transformation**



Gender Equality

Transform

Connect

Inspire

Learn



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Portfolio of innovative Projects and innovators

DigitWintech



CTDT-D
CIRCULAR
TRANSFORMATION IN
DIGITAL TWIN DEPLOYMENT



INDRESMAT®
INDUSTRIAL RESINS & MATERIALS



Transforming Industry: Digital, Green & Inclusive Innovation

Digitalization is a key driver for making SMEs more efficient, competitive, and resilient.

Let's see how European projects helped companies implement concrete digital solutions

Thanks to:



Extended Reality for Learning
in New Dimensions:



"XR2Learn is at the forefront of integrating eXtended Reality XR into professional learning across multiple sectors. Our mission is to harness digital innovation to create immersive, interactive training experiences that allow learners to practice complex technical tasks safely and efficiently. By doing so, we contribute to green sustainability, reducing material waste, minimizing energy use, and lowering costs compared to traditional training methods.

At the same time, XR2Learn drives social innovation by providing inclusive, accessible, and competence-based learning opportunities that support the upskilling and reskilling of workers, helping them adapt to evolving industrial needs. Through our XR2Learn platform, we provide a centralized and scalable environment to deploy and manage XR applications, supporting diverse sectors with tailored training solutions.

Through several innovative XR applications, from de-manufacturing and industrial safety to agrifood training, our project demonstrates how cutting-edge digital technologies can transform learning, boost workforce capabilities, and foster a more sustainable, inclusive, and future-ready industrial ecosystem"

LET'S MEET



UNIVERSITÀ
DI PARMA



Transforming Industry: Digital, Green & Inclusive Innovation

DISCOVER **THE INNOVATOR**

PROJECT: X-DE-MAN – eXtended reality platform enabling self-resilient operator in DE-MANufacturing industry

Mission: Pioneer the adoption of XR technology to train the next generation of industrial operators_5.0 employed in the de-manufacturing sector, unlocking the potential for circular economy and demonstrating the technology's capabilities within the consumer electronic industry (home appliances)

Innovation potential: across environmental, social, human, and economic domains, helping EU SMEs adopt circular economy models and stay competitive in evolving market.



More srl has been established in 2020 as result of a joint initiative made by Websolute spa (www.websolute.com), Cadland srl (www.cadland.it) and Nextlab srl (www.nextlab.pro). Powered by a team with more than 25 years of experience in integration of eXtended Reality Solutions (Virtual, Augmented, Mixed), Motion Capture, Technological Infrastructures and Advanced Multimedia Systems, More immediately position itself as one of the most expert, reliable and innovative companies in this specific sector.



**UNIVERSITÀ
DI PARMA**

The University of Parma (UNIPR) is a public university located in Parma in the Emilia-Romagna region of Italy. It has a very long history, tracing back to 962 AD. Within UNIPR, the Department of Engineering for Industrial Systems and Technologies (known by its Italian acronym DISTI) plays a key role in engineering-education and research. DISTI is focused on providing innovative, interdisciplinary, and highly specialised education, combining theory and practice, and aligned with industrial and technological needs. DISTI promotes internationalisation, quality assurance (in research, teaching and “third mission” i.e., societal outreach), and sustainability in its region. In practical terms, DISTI deals with engineering areas relevant to industrial systems and technologies: from design, process, systems integration, automation, etc. (implied by the name and mission)



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X-DE-MAN team consists of a structured mix of researchers and experts with cross-disciplinary knowledge in XR technologies & solutions, learning models, circular economy, and engineering design.

The team encompasses a technology provider (MORE srl) and a research center in mechanical and mechatronic design.

 MORE SRL XR tech provider & XR app developer Digital content & Motion capture IT infrastructure	 Enrico Santori – enrico.santori@more.mr Technical director and VR specialist  Bruno Arina – bruno.arina@more.mr Technical director and VR specialist  Diego Zazzaroni – diego.zazzaroni@more.mr VR software developer  Marco Cipolletti – marco.cipolletti@more.mr Systems IT engineer  Massimo Mastrilli – massimo.mastrilli@more.mr Senior IT manager
 UNIVERSITÀ DI PARMA UNIPR Education & research Life cycle engineering & Circular economy	 Claudio Favi – claudio.favi@unipr.it Associate professor in engineering design  Rachele Rizzoli – rachele.rizzoli@unipr.it PhD candidate in engineering design  Eleonora Fiore – eleonora.fiore@unipr.it Associate professor in sustainable design

Sector and challenges:

MORE srl operates in all product sectors (from automotive to aerospace, from machinery to retail, etc.) as its technological solutions can be used profitably within all of them.

UNIVERSITY OF PARMA operates mainly in the educational context; however, its technical knowledge and skills in product design, particularly in life cycle engineering, design for assembly and disassembly, and virtual reality, place UNIPR in strong connection with several industries, ranging from aerospace to household appliances.

Project journey & innovation:

MORE srl, through its involvement in EU-funded research and innovation projects such as XR2LEARN and Erasmus+ KA220, MORE consolidated its expertise in immersive technologies and digital engineering. This journey enhanced our innovation capability, enabling us to transfer research outcomes into market-ready solutions while strengthening long-term collaborations with European research and industrial partners.

UNIPR has actively participated in several EU projects, which have significantly supported its innovation journey. In collaboration with MORE srl, UNIPR has developed different virtual reality applications that highlight how research in engineering design and technical expertise in VR environment development can enhance innovation and foster the next generation of engineers and operators within the framework of Industry 5.0. These experiences have strengthened UNIPR's capacity to integrate advanced digital tools into education and industrial processes, promoting human-centered and sustainable innovation.

Digital Innovation

DISCOVER **THE INNOVATOR**

PROJECT: X-DE-MAN – eXtended reality platform enabling self-resilient operator in DE-MANufacturing industry

X-DE-MAN Project Showcase:



X-DE-MAN applies extended reality (XR)-based training to strengthen operator resilience, improve efficiency, and enhance safety in the de-manufacturing of consumer electronics. The project delivers an XR platform that integrates digital disassembly maps with a competency-based learning approach, creating immersive environments where workers can develop emerging skills before operating real equipment.

A complementary Beacon Application enables users to scan a QR code and receive step-by-step guidance during disassembly, supporting both training and live operations. By practicing tasks in a virtual environment and receiving real-time assistance, workers reduce errors and task time, gain deeper technical knowledge, and prevent workplace accidents.

X-DE-MAN supports EU SMEs by simplifying complex processes, improving competitiveness, and ensuring interoperability with industrial tools such as CAD and simulation software. Its holistic approach combines standardized knowledge repositories, automated 3D content generation from disassembly maps, and adaptable solutions for different operational contexts from appliances to automotive and aerospace.

Success case & major achievements in digital, green, social innovation, or gender equality.

X-DE-MAN contributes significantly to green and digital innovation by reducing waste from electrical and electronic equipment. Through efficient and guided disassembly processes, the project enables the **recovery of valuable materials** and the **extension of product lifetimes**. This approach makes circular economy business models more feasible, positioning the project as a true enabler of sustainable resource management and responsible production.

From a **social innovation perspective**, X-DE-MAN focuses on empowering the workforce by fostering **new skill generation and upskilling workers** in line with the demands of Industry 5.0. The project promotes improved work quality and safety through immersive learning experiences that prepare operators for real industrial environments.

The **gender dimension** is actively addressed by promoting inclusiveness and **equal opportunities in manufacturing and technical fields**. The use of virtual reality and personalized training pathways lowers entry barriers and supports the participation of diverse groups, encouraging more women and underrepresented individuals to engage in next-generation manufacturing activities.

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DISCOVER **THE INNOVATOR**

Advice for the community – As a mentor or innovator, what suggestions, insights, or practical advice would you give to other SMEs?

Successful innovation requires strong collaboration between SMEs and universities. This partnership combines the agility and market orientation of SMEs with the research capacity and long-term vision of academia. Through projects such as X-DE-MAN, we have seen how cooperation enables the anticipation of future industrial needs and the development of cutting-edge solutions that strengthen both sustainability and competitiveness.



THANK
YOU

X-DE-MAN

Our advice to other SMEs is to embrace collaboration early - involve research institutions not only as technology providers but as strategic partners in co-designing innovation pathways. Universities can help identify trends, validate ideas, and test emerging technologies, while SMEs bring practical insight and speed of implementation. SMEs should also invest in digital transformation and skill development, fostering a culture of continuous learning that empowers their workforce to adapt to new industrial paradigms such as Industry 5.0. Integrating immersive and human-centered tools like VR can improve safety, engagement, and productivity. It is important also to view sustainability not as a constraint but as a driver for innovation. Circular approaches—such as efficient disassembly and material recovery—create new business opportunities while contributing to a greener economy.

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XPOTLESS

TEAM: Hi! I am Inés Vázquez, an R&D Project Manager at ASINCAR, an agrifood technology and training center based in Asturias, Spain.

I am representing the XPOTLESS team, part of the XR2Learn project, in which ASINCAR has partnered with ENCLAVE, a leading SME in technology and innovation training, to develop an immersive training system for cleaning and disinfection procedures in the agrifood sector.

Sector and challenges: The XPOTLESS team focuses on the food sector, specifically on industrial cleaning and disinfection, crucial for food safety. These processes demand precision, continuous training, and skilled personnel, as minor errors can cause losses, risks, or regulatory non-compliance. XPOTLESS offers a personalized VR training platform simulating cleaning and disinfection tasks with interactive modules, gamified feedback, and adaptive learning. This approach enhances staff skills, optimizes performance, reduces resource consumption, and provides scalable, reusable training scenarios, supporting continuous improvement and ensuring safe, efficient operations in the agrifood industry.

Project journey & innovation:

ENCLAVE is an SME that has successfully implemented several projects in the XR training space, providing customized training solutions that integrate immersive simulations for industries that require technical skill development, such as machinery operation, safety protocols, and cleaning practices.

ENCLAVE's expertise in designing and implementing VR-based training systems, as well as its commitment to technological innovation, positions the company as a key player in the development of modern industrial training tools. ENCLAVE actively participates in XR development communities and is a member of several European innovation clusters focused on industrial technology, safety protocols, and education solutions. Through these engagements, the company stays at the forefront of technological advancements and contributes to the open-source community.

ASINCAR is an agri-food technological centre, as well as a business cluster and association. ASINCAR has different roles, working closely with the agri-food sector, with access to different SMEs from the whole value chain. ASINCAR has different R&D lines, covering different areas from digitalisation to valorisation of agri-food waste, food biotechnology and development of new products and processes. At EU level, ASINCAR is very active, currently involved in 11 projects related with different agri-food topics (H2020, HE, SME, LIFE+, CBE).



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Project Showcase:

XPOTLESS transforms traditional in-person industrial training into a scalable, blended learning model combining immersive content, hands-on practice, and personalized learning.

The **first phase delivers theoretical training** via a mobile app, offering 360° video content that demonstrates real-world procedures. This allows learners to prepare remotely, at their own pace, without needing physical presence.

The **second phase provides hands-on practice through Virtual and Mixed Reality (VR/MR)**, where users interact naturally with procedures using gesture recognition. The system detects users' emotional states and adapts experiences across three difficulty levels, boosting engagement and learning effectiveness.



XPOTLESS targets training in industrial cleaning and disinfection, crucial for public health and food safety. Enhancing these skills improves operational excellence and regulatory compliance. XPOTLESS modular structure, mobile app, and immersive VR/MR environments, makes this solution reusable and adaptable across industries.

XPOTLESS provides a replicable model for digitizing industrial training with XR technologies, balancing accessibility, procedural realism, and emotion-driven personalization. Its approach offers SMEs a practical path to modernizing training while improving safety, efficiency, and employee skill development.

XPOTLESS drives digital, green, and social innovation in the agrifood sector through immersive XR training that reduces accidents, enhances skill development, ensures regulatory compliance, and minimizes resource use. Trainees practice real-life procedures safely, avoiding exposure to hazardous chemicals or risky scenarios common in conventional training. Immersive simulations engage multiple senses, shorten learning curves, and improve knowledge retention, bridging theory and practice while supporting workforce upskilling, higher productivity, and lower turnover.



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The platform overcomes traditional training barriers, including inconvenient schedules, limited access to technology, and challenges in rural areas. XPOTLESS delivers inclusive learning by personalizing experiences using emotional feedback, engaging learners of all ages, genders, and abilities, and allowing remote access anytime, anywhere. Our sessions have achieved a gender balance of 55% women to 45% men, demonstrating commitment to equality in a historically male-dominated sector. **Socially, XPOTLESS promotes a human-centered approach aligned with European ethical values, enhancing safety, well-being, and equal opportunities.** Environmentally, it supports the circular economy by reducing waste and eliminating consumables like chemicals or equipment.

By combining digital innovation, sustainability, and gender-inclusive practices, XPOTLESS offers SMEs a scalable, ethical, and eco-friendly industrial training solution, strengthening skills, operational excellence, and safety across the agrifood sector.

Advice to the community

Our advice to SMEs is to embrace digitalisation as a tool to improve processes, training, and efficiency. Start by identifying areas where technology can enhance learning, productivity, or safety, even through small, incremental changes. Collaborate with partners, networks, and EU initiatives to access expertise and validation opportunities. Measure the impact of digital innovations on performance, engagement, and sustainability to guide future improvements and demonstrate value. In training, investing in employee upskilling and continuous learning is essential, as it strengthens skills, engagement, and operational resilience. Immersive technologies like VR and XR allow employees to practice real-life procedures safely, reduce risks, and improve knowledge retention. When implementing digital solutions, ensure they are inclusive, scalable, and adaptable to different teams or contexts.



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The team: Lider Teknoloji Geliştirme (LTG) is an SME based in Eskişehir, Türkiye. LTG develops XR-based training solutions, especially for industrial use cases. Within the XR4HRC project, funded under XR2Learn, the company has created XR training software that improves human-robot collaboration in robotics-supported industrial environments. LTG is a 12-person team with expertise in XR software development, IoT, sensor and embedded systems, as well as flight training simulators for civil aviation. The company also develops XR applications that support robotics technologies and shop-floor operations.



Sector and challenges:

LTG does provides products and services that support industrial process improvement and workforce training needs in plastics, machinery and metal, automotive and aviation. Under XR4HRC, the main focus is on robotic systems used in quality-control processes in the automotive sector. Key challenges include limited safe access to real robots for training, the complexity of human-robot collaboration tasks, and the need to standardize procedures while keeping operators engaged and confident in highly automated production lines.

Project journey & innovation:

Lider Teknoloji Geliştirme has solid experience in both national and international R&D projects. In its first international project, DEM-SaCROS (Erasmus+), LTG developed training modules for safety-critical railway staff. XR4HRC, funded through the XR2Learn Open Call, marked a major milestone, giving LTG deep know-how in XR and human-robot collaboration and opening doors to new collaborations and projects. Under the MASTER project, LTG led XR4MCR, where it completed a no-code authoring tool that enables users to create robotics training scenarios via drag-and-drop.



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Project journey & innovation:

Currently, LTG is working on the HARMONY project within MAGICIAN, focused on AR-integrated control systems that support robot control and reduce operators' cognitive load, and on StressLens within ENFIELD, which measures stress and cognitive load in demanding human-robot collaboration tasks and explores XR-based strategies to mitigate them

In the ITEA cluster, MONA LISA targets model-based engineering approaches to monitor and improve cyber-physical systems, while Narrate focuses on HR-oriented solutions using chatbot-integrated interactive 3D avatars and XR-based vocational training. Across these initiatives, EU projects have helped LTG build reusable XR components, expand its portfolio with solutions like XR4HRC, and mature its ideas towards market-ready products and services.

Project showcase

XR4HRC is an XR-based training and simulation solution designed to improve human-robot collaboration in industrial environments, with an initial focus on robotic quality-control cells in the automotive sector. The system uses VR and AR experiences built in Unity, deployed on Meta Quest 3 headsets and other OpenXR-compatible hardware, and leverages the Interact tool (LS Group) to create high-fidelity scenarios with real-world physics that replicate industrial robots' shop-floor workflows.

Operators, technicians, engineers and students can safely practise complex inspection and handling tasks, learn best practices and understand robot behaviour before interacting with real equipment.

XR4HRC's scenario engine and content library are designed for easy adaptation: training modules can be reconfigured, extended or localised to match different robot brands, layouts or sector-specific requirements, from plastics and metalworking to aviation. This makes the solution highly replicable for other SMEs that need to introduce robotics or collaborative robots while maintaining safety, quality and worker acceptance.



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Highlight your major achievements in digital, green, social innovation, or gender equality.



Through XR4HRC, LTG has developed a robust digital innovation: an immersive training environment that closely replicates robotic workcells and allows operators to experiment with different procedures, errors and recovery strategies without disrupting production. Scenarios can be tailored to user skills and tracked over time, creating a rich basis for competency management and continuous improvement.

By moving part of the training from physical robots to XR, companies can shorten ramp-up periods, reduce trial-and-error on the line and lower the energy and material waste associated with traditional hands-on training. Early pilots and continuing works show promising results: around 80 people have already been trained, mainly staff preparing to work in a university partner's robotics laboratory, and training time has been reduced by roughly 50% compared to conventional approaches. The project also supports safer and more inclusive workplaces by giving diverse profiles a low-risk way to build confidence with advanced robotics and human-robot collaboration.

As a mentor or innovator, what suggestions, insights, or practical advice would you give to other SMEs?

For SMEs starting their XR or digital-transformation journey, LTG's key advice is to begin with a concrete pain point on the shop floor and co-design solutions with the people who will actually use them. Start small, prototype quickly, measure impact and iterate; even simple pilots can unlock strong learning and internal buy-in. When exploring EU projects, building a trusted consortium and being clear about your unique contribution is more important than having a perfect product from day one. Use calls like XR2Learn as a way to learn, network and de-risk innovation, not just as funding opportunities. Our message to the MANTRA community: stay curious, share openly and don't be afraid to experiment together – collaboration is the fastest way for small companies to have a big impact.



THANK
YOU

LTG