4STEPS

*Towards the application of
Industry 4.0 in SMEs*

![Interreg Central Europe logo with European Union European Regional Development Fund and 4STEPS]

4STEPS project is addressing the main challenge of Industry 4.0 (I4.0) as a tool towards a new, digital industrial revolution holding the promise of increased flexibility in manufacturing, mass customization, increased speed, better quality, improved productivity, and its development is supporting the RIS3 in the target regions in the different sectors. SMEs in the target regions are lagging in the adoption of innovative tools and solutions proposed by I4.0 the revolution and need to increase transnational collaboration in facing this challenge.

The main project objective is to support the successful RIS3 implementation applying the I4.0 to all the industrial sectors identified by each region. The innovative elements of 4STEPS will be the methodology applied based on the involvement of all the actors of the quadruple helix, thanks to a bottom-up approach.

ABOUT THE PROJECT

The Project partners' competence is diverse when it comes to the nine Industry 4.0 technological pillars. Two project partners - namely CNA from Italy, and CCIS from Slovenia are not specifically focusing on either of the pillars, but they cover horizontally most of the pillars due to their widespread technical network.

CNA Emilia-Romagna, for example, actively participates within the High Technology Network, collaborating with relevant stakeholders to answer in a concrete and qualified way to the needs of the companies requiring external support for research and innovation, and for the introduction of the nine key enabling technologies inside their organizations. Regarding the Chamber of Commerce of Slovenia, they are not technologically oriented, but process oriented, but still, they are connecting all nine pillars on a horizontal level. CCIS has many competences and skills (tangible and intangible assets) and services for supporting the implementation of Industry 4.0.

ABOUT THE PROJECT

As far as the specific Industry 4.0 technological pillars are concerned, the contributions from the partners reflect that most of the partners have high competence in the field of additive manufacturing and simulation pillars.

Some partners provide valuable inputs in connection with Augmented Reality (RE:LAB, FHV, PBN,VDC) and Industrial Internet of things (IIoT) (RE:LAB FHV DEXIC, PBN) so they might provide support for institutions in this area as well. The transnational catalogue also depicts, that some partners are dealing with Autonomous Robots, (FHV, PBN, VDC), so they might advocate SMEs in this field too.

Through the specific competences of some of the Partners, also horizontal and vertical integration, cybersecurity and cloud technologies, as well as big data analytics currently can be offered as support services to SMEs.

SERVICES

Services are provided in next fields

SUPPORT SERVICES

Horizontal support

CNA Emilia-Romagna

CNA offers technical support services that cover all areas of Industry 4.0, such as training, promotion, counselling and assistance on topics of technological readiness level, innovation, finance, customer support, legislation.

Chamber of Commerce of Slovenia

CCIS is providing process-oriented support services horizontally across all nine pillars, this includes assessments, workshops and coaching for digital readiness and concepts of Industry 4.0, sustainable value chain, customer experience, access to finance, awareness of cybersecurity and pilot platform for the e-life cycle of products.

Autonomous robots

Vorarlberg University of Applied Sciences

FHV researches in the field of autonomous robots and artificial intelligence: H2M, M2M, M2H interaction. FHV's objective is to support the project target group and project stakeholders to make use of autonomous robot technology and learn and build up of knowledge base.

Pannon Business Network Association

PBN has experience and knowledge in the field of autonomous robots on topics of autonomous mobile robots, collaborative robots and flying autonomous robots.

Regional Development Agency Bielsko-Biala

During 4STEPS, ARRSA has started using autonomous robots and are organising training programs in terms of programming short production lines, machine learning and human-robot cooperation.

Simulation

Regional Development Agency Bielsko-Biala

FabLab Bielska-Biala is offering 3D scanning which can be used in rapid prototyping, quality control, reverse engineering, 3D modelling and simulation. Services include consultations and training for youth, students and SMEs.

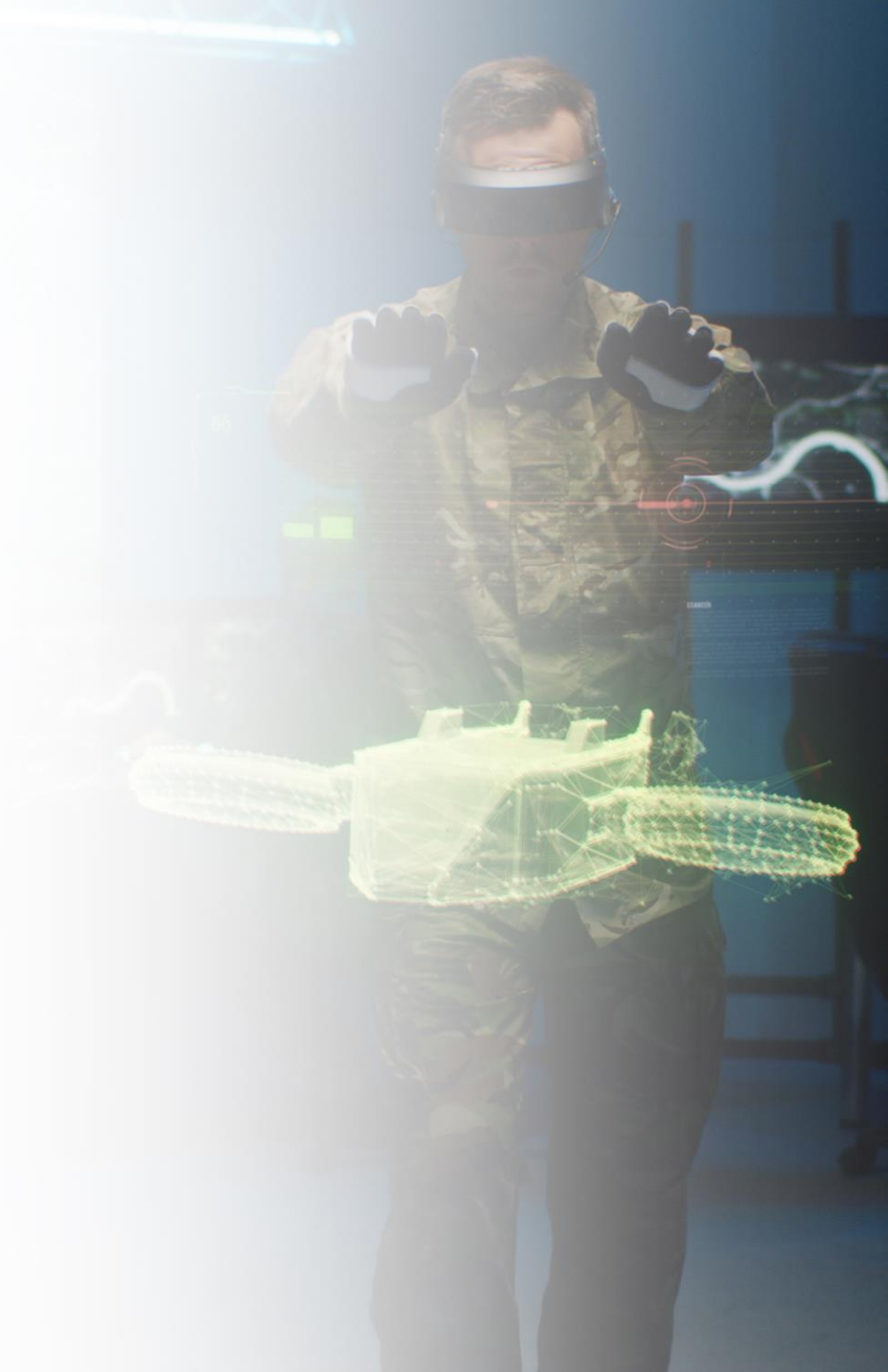### Vorarlberg University of Applied Sciences

FHV investigates the field of simulation and optimization, which includes the fields of machine learning, product and service personalization, and distributed execution framework. Services are performed on intra-organizational projects in close collaboration with local businesses and industry.

Pannon Business Network Association

PBN is constantly monitoring the latest leading software and technologies on the market on the topics of modelling, 3D scanning and digital twinning, to provide extended technical knowledge and communicate the results to partners.

Virtual Dimension Center

VDC is consulting companies regarding use cases for and trends in augmented reality simulation. Its members are offering or using simulation software in fields like product development or production planning.

Horizontal and vertical systems integration

Vorarlberg University of Applied Sciences

FHV applies an eco-system approach and is investigating the challenges to integrating different IT- and Communication systems and machines horizontally and vertically for a seamless exchange of data and information.

Pannon Business Network Association

PBN is dealing with integration of all data, gained from the available machines at the different technological pillars, into a common system.

Industrial **Internet** of Things

RE:Lab s.r.l.

RE:Lab is active in the IoT domain, both developing products and participating in R&D projects. Among its expertise IoT connectivity platform, urban mobility and intelligent transport systems are included.

Vorarlberg University of Applied Sciences

FHV is active in the field of emergent technologies in I4.0 and IoT such as semantic database solutions, machine learning, cloud manufacturing, 3D printing, blockchain and machine-to-machine interaction.

Dex Innovation Centre

DEX IC offers complete equipment for creating devices based on the Industrial Internet of Things and capabilities such as printed circuit boards.

Pannon Business Network Association

PBN can provide IIoT services with utilising its own teaching and learning factory (TLF) manufacturing unit with remote access to broaden services directly related to digitization competencies of the partners.

NINE PILLARS OF INDUSTRY 4.0

Cybersecurity

Vorarlberg University of Applied Sciences

FHV educates and trains students, managers and organizational decision makers about the threats and challenges in digital transformation of systems. FHV also offers a qualification network about cybersecurity.

Cloud technologies

Virtual Dimension Center

VDC is providing a network emulator for testing distributed virtual work environments.

Additive manufacturing

RE:Lab s.r.l.

RE:Lab promotes the processes of tailoring and personalization of products, through the use of additive technologies and digital manufacturing

Regional Development Agency Bielsko-Biala

FabLab Bielsko-Biała is focused on 3D printing and rapid prototyping technologies. Their main scope of activities is in education and raising awareness in terms of the possibilities of this cutting-edge technology.
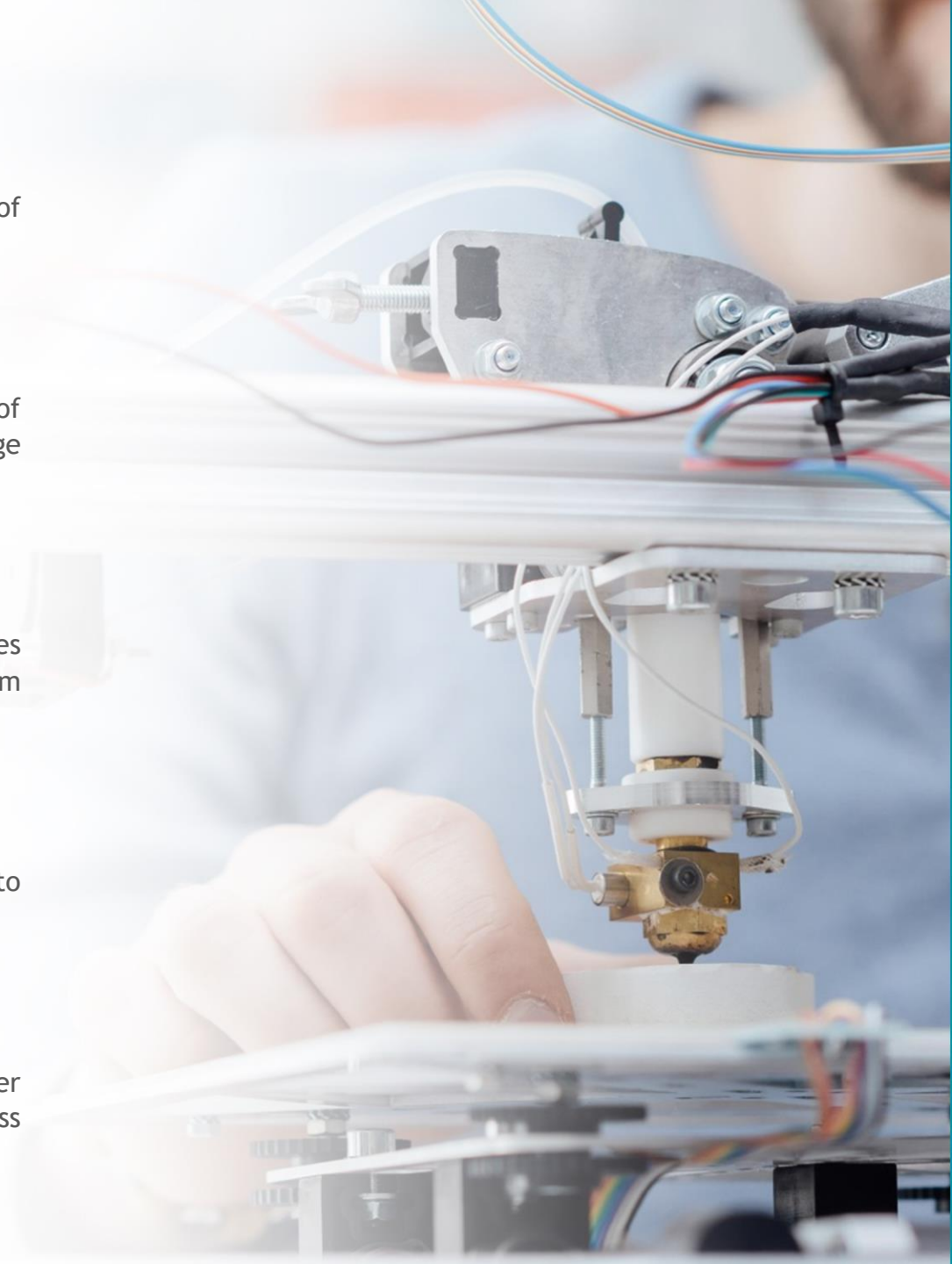
Vorarlberg University of Applied Sciences

FHV pro-actively makes use of 3D printing and rapid prototyping technologies for education purposes of students (full- and part-time) as well as external staff: managers and decision makers from (regional) organizations.

Dex Innovation Centre

DEX IC is actively involved in the field of 3D printing and facilitates access for interested parties to create their own designs and training opportunities in 3D modelling and 3D printing.

Pannon Business Network Association

PBN's goal is the integration of the additive manufacturing – based on wide spectrum of polymer printers and expertise - into the research and development, prototype production and into mass customized manufacturing.

Augmented reality

RE:Lab s.r.l.

RE:Lab is active in the area of Augmented Reality especially for the promotion of Cultural Heritage.

Vorarlberg University of Applied Sciences

FHV makes use of augmented reality and virtual reality technologies for virtual tours and manufacturing. FHV is providing AR/VR clean room to test its effectiveness for various applications.

Pannon Business Network Association

PBN is focusing on industrial and marketing solutions with different AR technologies. Our applications are concentrating on showing unique 3D models, 3D products in interactive and innovative way.

Virtual Dimension Center

VDC is consulting companies regarding use cases and trends in augmented reality.

Big data and analytics

Vorarlberg University of Applied Sciences

FHV runs several projects in the field of big data and analytics, such as the Josef Ressel Center for Robust Decisions. They are using big data and analytics for modeling, simulation and optimization as well as -in further consequence- the design and development of Evolutionary Algorithms.

Pannon Business Network Association

Our data analysis activities are based on the organization and transformation of a large amount of unsettled data based on customer-specific tasks, in order to increase the profitability and efficiency of businesses.   Applying wide range of visualization techniques, abstract information and conclusions can be also presented in a comprehensible way.

List of service providers

- **CNA Emilia-Romagna**

- **RE:Lab s.r.l.**

- **Regional Development Agency Bielsko-Biala**

- **Vorarlberg University of Applied Sciences**

- **Dex Innovation Centre**

- **Pannon Business Network Association**

- **Chamber of Commerce of Slovenia**

- **Virtual Dimension Center**

PROJECT PARTNERS

CNA Emilia-Romagna:

CNA Emilia-Romagna has a long experience in promoting and supporting innovation in SMEs by acting as an intermediary between the supply of research output and small enterprises' demand, through specific actions including the development, dissemination and implementation of best practices for the introduction and management of innovation and in the field of RIS3 and Innovation 4.0.

RE:Lab s.r.l:

RE:Lab is a research-oriented SME, created in 2004 as a spin-off of the Human Machine Interaction (HMI) Group of the University of Modena and Reggio Emilia. RE:Lab main business is the design and development of hardware and software embedded systems, human interaction, algorithms for intelligent systems, and applications for machine learning, test and reliability.

PROJECT PARTNERS

Regional Development Agency Bielsko-Biala:

The range of services provided by the Regional Development Agency Joint Stock Company includes: Comprehensive aid for small and medium enterprises, professional counselling, organizational, economic, financial, legal and marketing issues, organization of training and seminars, International cooperation, creating associations, looking for foreign investors, promotion of the region and its economic potential.

Vorarlberg University of Applied Sciences:

FHV is active in the field of Digital Transformation, Industry 4.0 and Physical Internet in combination with Advanced Manufacturing, Logistics/SCM and ICT. FHV is an academic partner and provides/disseminates research results about "how to implement a sustainable factory of the future". FHV is an University of Applied Sciences and mainly educates students and adults in Bachelor and Master programs.

PROJECT PARTNERS

DEX Innovation Centre:

DEX Innovation Centre (DEX IC) is a private innovation hub, the fastest growing in the country. It focuses its activities on improving life and society through digital innovation, research and technology. DEX IC raises capital for innovative projects and products for the future in transport, energy, healthcare and ICT. It helps to build start-ups and educates students and pupils. In its 10 years of existence, the DEX IC team has organized several own industry accelerators, runs a virtual incubator for start-ups and owns a technology workshop, called µFablab. DEX IC is a partner of the European networking initiatives EIT InnoEnergy and EIT Health.

Pannon Business Network Association:

PBN, founded in 2006, as a regional business development organization aims at strengthening the economic performance of small and medium sized businesses in the Western Hungarian Region. As a leading public economic development organization in the region, the network contributes to the quality of employment and the improvement of the competitiveness of enterprises with the cooperation and networking of the regional stakeholders. PBN's technology transfer spin-off company, called am-LAB, which was awarded the honoring best Digital Innovation Hub title of 2020 at the 1st European Digital Innovation Hub Conference. Service center specializes on the application and presentation of the most recent manufacturing technologies to develop smart end-user product in strong co-operation with their key customers.

PROJECT PARTNERS

Chamber of Commerce of Slovenia:

CCIS is a non-profit, non-governmental, independent business organization representing the interest of its members. With over 160 years of tradition, it is the most influential business organization in Slovenia. CCIS unites 26 branch associations, representing all important industry sectors of Slovenia under its roof. CCIS has 13 regional offices in Slovenia. CCIS is composed of branch business associations, regional associations and professional departments. CCIS represents all important industry sectors of Slovenia.

Virtual Dimension Center:

The Virtual Dimension Center (VDC) is Germany's leading competence network for Virtual Engineering. Technology and service providers, users, research institutions and multipliers work together in the VDC network along the entire value chain of Virtual Engineering- namely in 3D simulation, 3D visualization, product lifecycle management (PLM), and Virtual Reality (VR).

PROJECT FIGURES

7

COUNTRIES

8

PARTNERS

€

1710571

MILLION ERDF

€

2085368

MILLION BUDGET

https://www.interreg-central.eu/Content.Node/4STEPS.html

Towards the application of Industry 4.0 in SMEs

4STEPS project is supported by the Interreg CENTRAL EUROPE Programme funded under the European Regional Development Fund.