

Collaboration in digital transformation within and beyond borders

From theory to practice.
Champions of industrial revolution
within S3HubsinCE project.



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INTRODUCTION

No matter how large or small, and regardless of the sector, all companies play a significant role in bridging the gaps in the digital transformation intended to make Europe even more competitive, resilient, and sustainable. With a supporting ecosystem of universities, research institutions and decision makers, companies are the first to drive the change and introduce business responsibility and joint actions to solve digital transformation challenges through business innovation and collaboration.

Since 2019 a consortium of leading digital transformation partners gathered in S3HubsinCE project <https://www.interreg-central.eu/Content.Node/S3HubsinCE.html> have joined forces to work together and create a transnational support structure based on regional Digital Innovation Hubs. Partners from Austria, Croatia, Germany, Hungary, Italy, Poland, and Slovenia have strengthened their competences, and exchanged experience and good practices between project partners operating in business, research and science, and regional authorities.

The S3HubsinCE project creates and tests a common model to help the institutions responsible for the regional and national strategies, understand how regional innovation strategies for smart specialisations (RIS3) can benefit from a connected network of Digital Innovation Hubs operating in various regions of Europe. The S3HubsinCE Project Partners test this model and disseminate the results to institutions responsible for the strategies to support the development of subsidy programmes for 2021-27. The success of such an approach will have a continuation in a new initiative of the European Union called European Digital Innovation Hubs (EDIHs) which will function as one-stop shops that help companies respond dynamically to the digital challenges and become more competitive, by providing access to technical expertise and experimentation as well as the “test before invest” options.

The aforementioned model is also built on the assumption that there are organisations in each region, which deliver this competitive advantage associated to specific topic areas. Thereby, these organisations “champion” or embody regional innovation smart specialisation and are critical for its delivery. In the successive stages of the project, Partners have extended and deepened their understanding of stakeholders needs, strengthened competences to support the process of digital transformation, and designed and implemented joint actions aimed to support organisations and businesses strategic to the region’s RIS3 success.

There are 51 institutions named RIS3 Champions identified in the project. They play a role of ambassadors of Industry 4.0 and are working together with regional strategic partners to boost digital transformation in enterprises, creating „constellation”.

The concept of a “constellation” is used to highlight a parallel between the important significance assigned to celestial constellations when individual stars are viewed together. The Constellation of CERIS3 Excellence describes the network built of the connections created between RIS3 Champions, through the S3HubsinCE Partnership, via transnational actions generated between Partners in pursuit of the creation of value in the regional innovation ecosystem of each territory.

WHO ARE THE RIS3 CHAMPIONS?

This publication intends to give a comprehensive picture about RIS3 Champions. During the project, partners have identified 51 best-in-class institutions from Germany, Austria, Poland, Hungary, Slovenia, Croatia, and Italy, and pioneers of digital transformation with identified industrial use cases worth disseminating. All of them are performing excellently in their respective areas of specialisation.

The identified RIS3 Champions are represented by SMEs, Large Enterprises, Business Support Organisations, Higher Education/Training Centres and Schools, and Research Technology and Development Organisations.

The process of identification and selection of RIS3 Champions was multi-staged and followed by individual interviews with candidates realised by each Project Partner. In the portfolio of RIS3 champions, SMEs play a dominating role, with 41,2% of the entire group, that is 21 out of 51 organisations. They were followed by Higher Education and Research organisations with 14 actors. Apart from SMEs and Higher Education and Research organisations, Large Enterprises, Business Support Organisations, Technology Transfer university foundations and DIHs were also involved, and accounted for approximately 30% of the total.

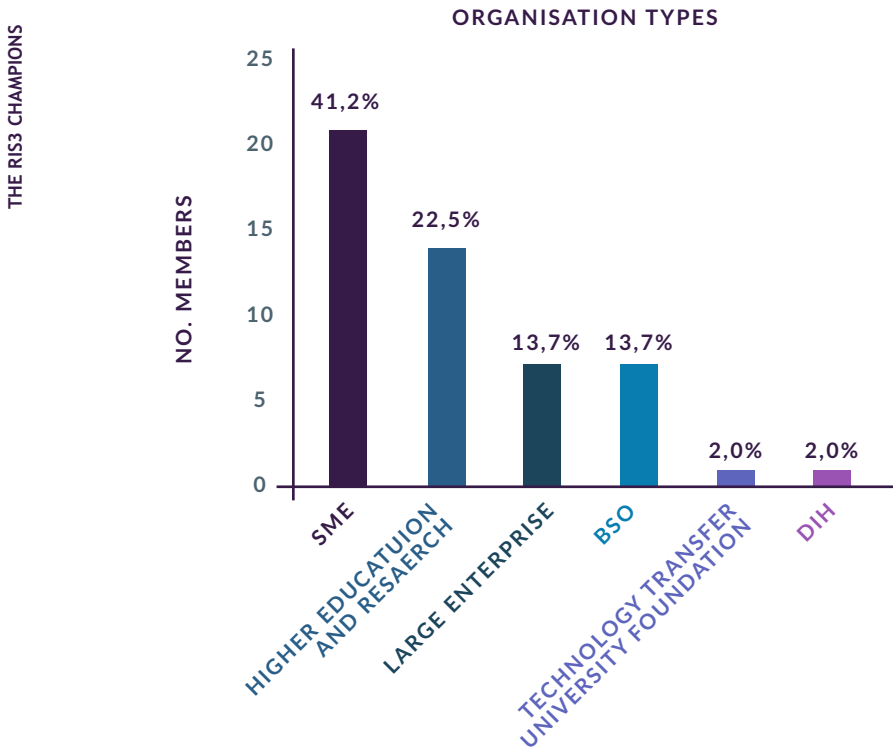


Figure 1: RIS3 Champions broken down by organisation type (Source: D.T3.1.2)

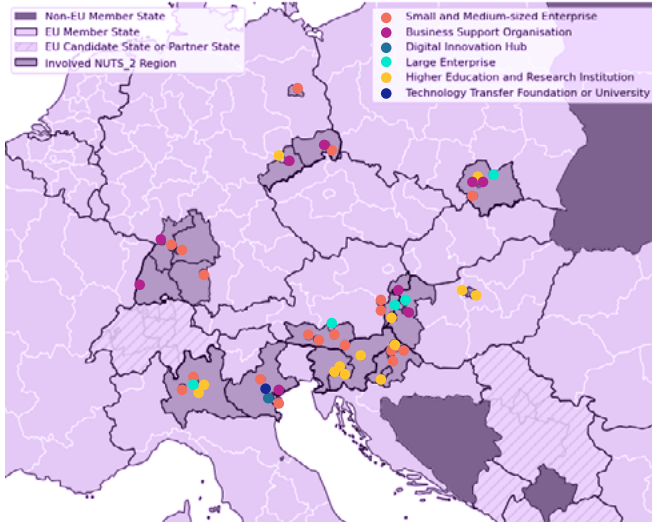


Figure 2: Geographical distribution of RIS3 Champions broken down by organisation type (Source: D.T3.1.2)

RIS3 Champions operate in numerous fields. Importantly, companies provided information about their sector(s) using the official European industry-standard classification system NACE codes. Figure 3 shows that approximately a quarter of the RIS3 Champions in questions are active in scientific research and development (M72) and another quarter have responded that they operate in Computer programming, consultancy and related activities sector (J62). Nevertheless, Figure 3 also reveals presence of champions in several other sub-sectors in the professional, scientific and technical activities (M) main sector, and also a remarkable involvement in the Manufacturing (C) and Information and Communication (J) sectors.

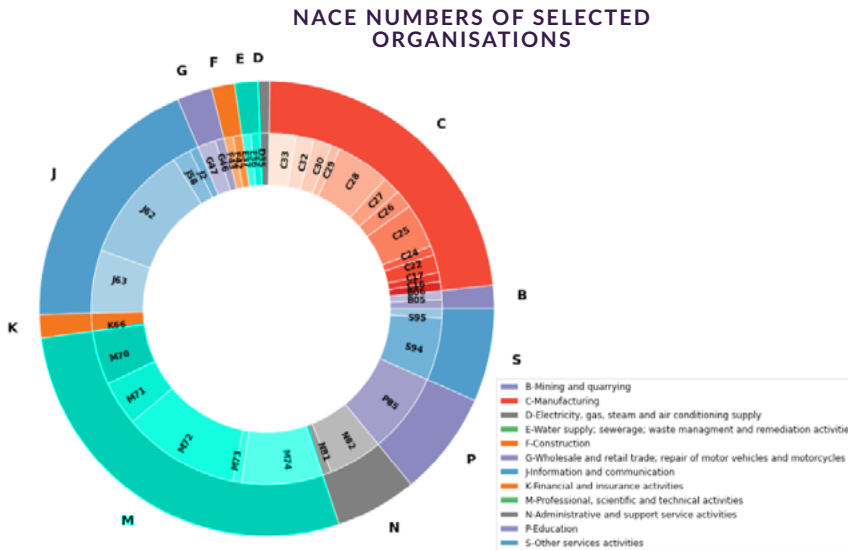


Figure 3: RIS3 Champions broken down by sectors (Source: D.T3.1.2)

RIS3 Champions were also requested to indicate their interest in Thematic Priority Areas (known as Navigation Crews, established by Project Partners in the first phase of the S3HubsinCE project). The respondents were given an option to choose as many from 10 such Navigation Crew topics as were applicable to them.

The Navigation Crew topics provided were:

1. Data Analytics, Complex Simulation and Modelling
2. Machine Vision
3. Predictive Maintenance
4. Factory & Process Automation
5. DI&I: Machinery
6. Advanced & Smart Materials
7. Industrial Internet of Things (IIoT)
8. Digital Marketing
9. Innovation in a Circular Economy
10. Design & Engineering for Additive Manufacturing

Figure 4 clearly illustrates that more than the every other RIS3 Champion has expressed interest in three thematic areas, namely Data Analytics, Complex Simulation and Modelling (62.7%), Industrial Internet of things (60.8%), and Factory and Process Automation (54.9%). It can also be emphasised that a third of the champions in question have chosen Innovation in Circular Economy and Predictive Maintenance as areas of interest. At the other end there is Machinery and Machine Vision chosen by the smallest number of champions, nonetheless still interesting for 8-8 champions.

THE RIS3 CHAMPIONS

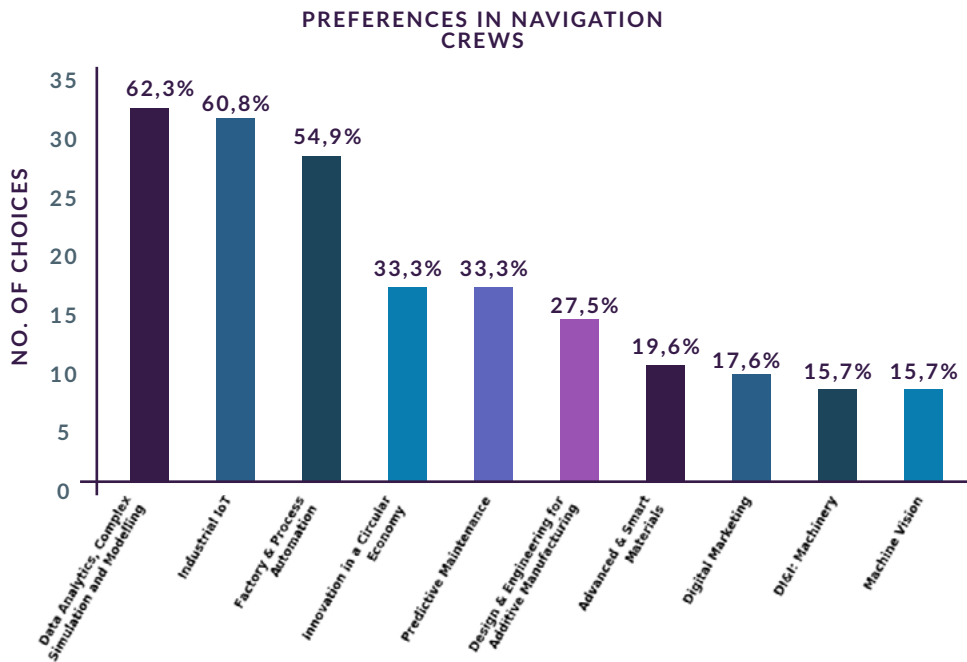


Figure 4: Navigation Crews preferences among RIS3 Champions (Source: D.T3.1.2)

The interests in the Navigation Crews have been further analysed for the connections between organisation types and the Navigation Crew topic(s) selected. Figure 5 illustrates that SMEs, most copiously represented in the sample (more than half of the involved SMEs), are mainly interested in Data Analytics, Complex Simulation and Modelling (12 out of 21 SMEs) but their interest is also significant in Factory and Process Automation and in Industrial IoT (11-11 SMEs).

As far as the Higher Education and Research institutions are concerned, the thematic interest is very similar to that as the SMEs. As it can be gleaned from Figure 5, 12 (out of 14) Higher Education actors are interested in the Data Analytics field, whereas 11 such organisations have also expressed interest in the IIoT, and ten also consider Factory and Process Automation a significant thematic area.

INTERESTS BY ORGANISATION TYPE

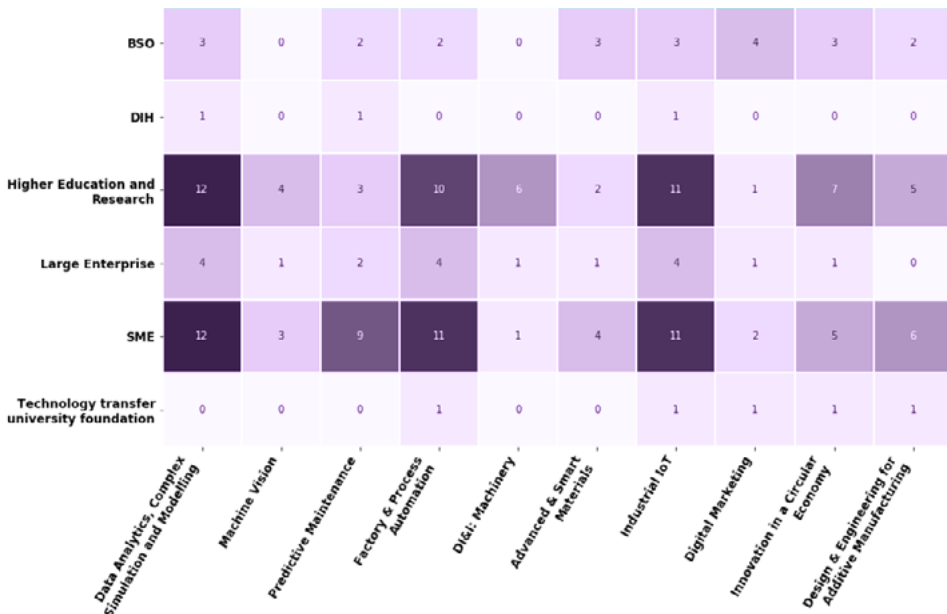


Figure 5: RIS3 Champion interests by organisation types (Source: D.T3.1.2)

Taking into consideration the replies of the RIS3 Champions concerning Navigation Crew topics, organisation types 5 different clusters could be establish:



Industry 4.0 Cluster -

23 members (A vast majority of the members, mostly higher education institutions and SMEs, have selected **Data Analytics, Complex Simulation and Modelling, Industrial IoT, and Factory and Process Automation**)



Digital Marketing and innovation in a Circular Economy topics -
6 members



SME manufacturers with interest in 3D Printing and automation -
7 members



A 3D printing and smart materials-oriented group, mainly SMEs -
4 members



Data analytics-oriented group -
11 members

The next chapter discusses further the characteristics of each RIS3 Champion and their products or services.

LET'S MEET THE RIS3 CHAMPIONS

AUSTRIA
Regions: Burgenland, Carinthia



GERMANY
Regions: Stuttgart, Freiburg, Karlsruhe, Tübingen,
Berlin, Dresden, Chemnitz



ITALY
Regions: Lombardia,
Veneto



HUNGARY
Regions: Budapest,
Nyugat-Dunántul



POLAND
Region: Małopolska



CROATIA
Regions: Grad-Zagreb,
Sjeverna Hrvatska



SLOVENIA
Regions: Vzhodna Slovenija,
Zahodna Slovenija





THE ASSOCIATED DIHS

smartfab CARINTHIA is targeting regional enterprises and schools. The current focus is on two major topics:

- designing for additive manufacturing
- innovation in a circular economy

Both topics are considered advanced engineering techniques. Training and education are applied to knowledge transfer and awareness building through courses and workshops. Transfer projects are performed for technology transfer to enterprises based on funded research projects, and students' master and bachelor theses. The students' works are often the initial phase of subsequent research projects with enterprises.

Research and development results of the university's research groups, particularly of the Carinthia Institute for Smart Materials and Manufacturing Technologies (www.fh-cismat.at), are published and provide the foundation for transfer projects and/or training.

smartFAB CARINTHIA
<http://smartfab-carinthia.at/>



The DIH-Ost is an organisation set up by the Austrian Research Promotion Agency (FFG) and the federal states of Lower Austria and Burgenland. Since 2019 it has offered a comprehensive range of services to support the digital transformation of small and medium-sized companies in Eastern Austria.

The Digital Innovation Hub focuses on the following topics:

- Internet of Things (IOT), and Sensor Technology and Connectivity
- Block chain and IT-security
- 3D printing
- Building Information Modelling (BIM), Data Visualisation, Data-Analysis, and Augmented Reality and Virtual Reality

DIH Ost
<https://dih-ost.at>



ORTNER REINRAUMTECHNIK



ORGANISATION PROFILE

Ortner is a company established in 1985 as a family business with core activity in ventilation and air conditioning installations for clean rooms for Siemens (today Infineon). Over the years, the company has developed into a specialist in building infrastructure systems for the special conditions required for clean rooms. Since 1995, the product portfolio was expanded to include outsourcing/parts cleaning and the development of automated transport and storage systems. In 2001 the company transformed from a service and installation company to a machine manufacturing company for systems, devices and processes for the life-science industry.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The “Cleanrooms unlimited” Ortner group has dealt with comprehensive cleanroom technology across all industries and services for about 40 years, from clean room construction, via clean room adjustments during ongoing production, equipment installation and integration, the development and manufacture of devices, systems, components and processes for the creation of microbiological and particulate purity, automation and clean room transport systems, and special system construction, to maintenance and servicing.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Purity is paramount. Ortner is a system provider for locks, isolators, clean air systems and decontamination processes. Ortner offers solutions for fast, safe, and reliable clean room processes to protect people, products, animals, research work, and the environment from sources of contamination and particles.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Since 2007, the company has been engaged in the construction of equipment / special systems to develop particulate and microbiological purity for pharmaceutical and biotechnology, healthcare, laboratory, semiconductor, and food industries. In addition, the company focuses on process and product development for decontamination locks, isolators, clean air systems, and decontamination processes.

Today the company is an internationally recognised partner for complex system integration in clean room environments in many industries.

SPRINGER MASCHINENFABRIK GMBH



ORGANISATION PROFILE

The company was founded in 1952. The company employs ca. 700 people in its headquarters in Friesach in Carinthia, and branches in Austria, Italy, Canada, USA, Sweden, and Finland. Its annual turnover is ca. €150 million. Its business is planning, developing, and producing machinery and conveyor systems for the wood-processing industry.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

All processes related to the transport, sorting, and grading of wood are optimised to the highest level, and implemented in a technically sophisticated way. SPRINGER log-processing machinery and lines are the ideal solution for preparing logs for sawmill cutting. The systems are specifically designed for the required performance level and can be fed with small-dimension, large-dimension, and long timber. The systems are designed as modules to guarantee top productivity.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The timber industry in Carinthia comprises around 160 sawmills and wood processing plants offering about 2900 jobs. The value of the timber industry output in Carinthia is close to €1 billion. In addition, more than 200 carpentry and timber construction companies employ around 1500 people and train around 170 apprentices for the timber industry. The challenge is to introduce and promote innovation combined with digitisation using the latest technologies. Springer is constantly developing innovative solutions to offer excellent services to meet the needs of the region.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

SPRINGER is the global leader for innovative concepts for the wood-processing industry. Despite the excellent ease of use and maximum operating safety of Springer machines, well-trained staff are necessary to ensure optimum operation and efficient production. Experienced Springer employees will gladly share their knowledge with your staff during a varied theoretical and practical training course.

SPRINGER[®]

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WIRTSCHAFTSAGENTUR BURGENLAND GMBH



ORGANISATION PROFILE

Wirtschaftsagentur Burgenland is a regional business support organisation that contributes a wide range of activities to the success of the Burgenland region. Its business areas include funding and financing, as well as information and consulting for companies on their investment projects in the region. In addition, Wirtschaftsagentur Burgenland annually hosts the Innovationspreis Burgenland, a regional award for innovative companies. A startup, spinoff, and founder centre called Südhub will open in 2021 to support innovative founders in the region.

CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

The main focus of Wirtschaftsagentur Burgenland is to support the regional economy. Therefore, the business competencies are Funding & Financing, Properties & Buildings, startup support, and Information & Consulting.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

In Burgenland, about 85% of the existing companies are small enterprises with an average employment of 1-9 persons. There is a lack of resources for active promotion of the innovation process in such companies. It is also difficult for the regional start-ups to develop innovative business ideas towards market maturity.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The organisation is the first point of contact for innovative companies and founders from Burgenland. With a vast experience in innovation, funding, networking, financing and business planning, the support of Wirtschaftsagentur Burgenland can best be described as a one-stop-shop. Thanks to the close relations with the government of Burgenland, the agency can also support by providing links to politicians and other economic stakeholders. With the establishment of the SüdHub, a regional hub for founders, startups, and spin-offs, Wirtschaftsagentur Burgenland has established a contact point for all affairs related to innovation in Burgenland.



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LINDNER-RECYCLINGTECH GMBH



ORGANISATION PROFILE

Lindner looks back to a long and traditional history as an Austrian family business. Founded in 1948 as a machine and plant producer for the wood industry, the successful company for waste shredding and processing is now run by the family's third generation. Lindner has more than 300 employees worldwide.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

At its production facilities in Spittal/Drau and Feistritz/Drau in Austria, Lindner manufactures machines and system components that are exported to almost one hundred countries. In addition to stationary and mobile shredders for waste processing, the portfolio includes complete systems for plastics recycling, SRF, and waste wood processing. The shredders can be used e.g. for municipal solid waste, commercial and industrial waste, waste wood, plastics, packaging materials, paper, and light scrap.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

There are always challenges related to the construction of recycling machines, and Lindner is facing those. It is a known fact that natural resources are being depleted quite fast. Therefore Lindner always works on resource-saving solutions.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

As mentioned above, implementing resource-saving solutions is always the main target for Lindner. A proof of this can be the different driving units Lindner offers to guarantee low energy consumption.

H&P TRADING GMBH



ORGANISATION PROFILE

The company, H&P Trading GmbH, is a certified company operating in Kemetten in Burgenland, founded by Erwin Hochwarter in 2002. The company provides services in the field of development, prototype construction, repair, remanufacturing, troubleshooting and re-design of railroad components, especially obsolete ones, as well as services in the field of mechatronics.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

H&P Trading has expertise in various areas of Mechatronics and obsolescence management. In addition, the company is one of the first Austrian companies to be ECM-certified, thus fulfilling the high international requirements for an ECM maintenance operation. With many years of experience and great expertise, it can provide the following services: reconditioning of railroad components, especially obsolete components, maintenance work according to ECM, lightweight components (R&D), product development, prototyping, testing, serial production, re-designing.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

In the wake of mergers of large railroad operators (e.g. Alstom, Bombardier) and company purchases by foreign railroad operators (CRCC China), there are massive problems with spares supply. Further, many components can no longer be purchased and the delivery times are counted in months. Those of over 12 months are not unusual and are a knock-out criterion for every railroad operator. Therefore H&P Trading refurbishes used components/assemblies, repairs them or replaces parts so that they can be reassembled in the shortest possible time. The fast processing time at H&P Trading offers an alternative to the long delivery and production times

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

In future, used railroad components, in particular obsolete components from all over Europe, will be repaired or remanufactured and stored at the new location at Steinbrückl 22. This saves costs in maintenance/servicing, and the train sets are available for use again in the shortest possible time. Furthermore, the storage also allows rail operators to plan and carry out their maintenance intervals in a safe and cost-saving way. In addition, used remanufactured components such as gearboxes, and brake and driveline components offer lower environmental impact, better sustainability, shorter procurement times, lower maintenance expenses, service life extension of 200-300%, and lower life cycle costs. With a buffer storage of maintenance components, H&P Trading creates a clear competitive advantage.



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WILD HI-PRECISION GMBH



ORGANISATION PROFILE

The company was founded in 1999 by Managing Director Hermann Rodler and Technical Manager Roger Pausche. With great passion for the measurement technology and quality management, WILD Hi-Precision became the first address in Austria when it comes to test equipment calibration and contract measurement. With the two laboratories in Völkermarkt and Vienna and around 50 accredited procedures, they are the largest calibration laboratory in Austria. They calibrate around 100,000 pieces of measuring and test equipment per year for more than 1,500 customers from the industry, technology, and science.

CLUSTER 3: #3D Printing, #Advanced & Smart Materials

FIELD OF EXPERTISE

For 20 years, WILD Hi-Precision has been fully committed to providing top performance for its customers in calibration, test equipment management, measurement technology, and QM consulting and training. WILD Hi-Precision was the first centre in Austria accredited for length calibration. With high-tech laboratories equipped with the very latest measuring and testing devices, it remains a pioneer when in precision and measurement technology. This guarantees the highest quality standards. Thanks to the 3-D coordinate measuring technology, computer tomography, and calibration, the company makes a decisive contribution to manufacturer quality and makes it possible to avoid product liability cases and claims for compensation.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Wild Hi-Precision provides its customers with top performance in the fields of calibration, test equipment management, measurement technology, and QM consulting and training.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

WILD Hi-Precision was the first accredited calibration centre for length in Austria, and is still a pioneer when in precision and measurement technology.

With its cooperation partners Quality Austria, WIFI Carinthia, and AC Styria, WILD offers standardised, regular courses, for instance the Automotive Quality Assistant. The course is held twice a year in cooperation with WIFI Carinthia at the Völkermarkt location. Another course series is dedicated to the measurement technology.



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BITMOVIN GMBH



ORGANISATION PROFILE

Bitmovin was founded in 2013, after the founders' research on the MPEG-DASH video streaming standard at the University of Klagenfurt. Bitmovin was part of the YCombinator programme and secured an investment round with Highland Europe venture capital fund as main investor. In 2014 the company was a top 100 online media company. Today it has over 150 employees all over the world, and offices in San Francisco, Denver, London, Berlin, Klagenfurt and Vienna. The company is also investing heavily in research and development to be always ahead of the trends. It has teamed up with the University of Klagenfurt in the ATHENA project.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Bitmovin is a multimedia technology company which provides services that transcode digital video and audio to streaming formats using cloud computing, and streaming media players. The company has been at the forefront of industry innovation and all major developments in the digital video streaming industry. Bitmovin built the world's first commercial adaptive streaming player and deployed the first software-defined encoding service that runs on any cloud platform. Its cloud-native technology offers the most flexible and scalable media encoding, playback, and analytical solutions available with unparalleled device reach, ease of integration, and world-class customer support.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Bitmovin provides companies all over the world with software solutions for the most complex problems in video streaming.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Bitmovin customers benefit from optimised operations, reduced time-to-market and costs, and the best viewer experience on any device.



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GÜSSING ENERGY TECHNOLOGIES GMBH (GET)



ORGANISATION PROFILE

GET was founded in 2003 to support the activities of the scientific Network BEST, and to build and run demonstration plants like the Güssing Biomass Gasification Plant. That focus was extended significantly already in the early years, with the addition of teaching and training activities, and of several subsections, to mention architectural engineering, consultancy, and IT.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Güssing Energy Technologies engages experts in such disciplines as architectural, mechanical, chemical, process, and electrical engineering, as well as in social and business sciences and information technology. They operate an engineering hub for mechanical engineering and hold business licences in consultancy, IT and trading for all goods of the Austrian chamber of commerce. They developed a series of technologies, provide Open Source Tools, and are working hard on know-how transfers, at the moment mainly in Europe, China, Nigeria, and the US, as well as on the removal of non-technical barriers.

DESCRIPTION OF THE KEY CHALLENGE THE ORGANISATION IS KNOWN FOR ADDRESSING IN THE REGION AND/OR FURTHER AFIELD

Digital technologies are already contributing to the resilience and competitiveness of the SMEs in the region. However, many companies are overwhelmed by the rapidly developing technologies being offered and/or do not recognise the benefits that these technologies generate for their business processes.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

As part of the Austrian cooperative research network GET coordinates the thematic focus on digitisation. The institutes coordinated by GET support SMEs in their innovation and digitisation efforts by promoting the development of digitisation tools for an optimal range of services for SMEs and by highlighting the potential of digitisation technologies. In this way, GET initiates and supports the digital transformation of small and medium-sized companies in Austria.



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RMDATA GMBH



ORGANISATION PROFILE

rmDATA is a leading software company for surveying, geoinformation, geodata management, and reality capturing in German-speaking countries. The company was founded in 1985 and specialises in innovative solutions in geoinformatics. It focuses on smart and consistently user-friendly software. A team of over 90 employees develops software solutions and serves customers in Austria, Germany, Switzerland, Luxembourg, and Italy.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Expertise in:

- survey (cadastral, infrastructure, building, observation)
- geoinformation (infrastructure, land, network management)
- geodata management (data migration, data verification, data analysis)
- reality capturing (building measurement, terrain measurement)

Services: product training, individual training, maintenance and support, software consulting and customisations.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Digital data and information are the basis for many services in the field of innovation, digitisation, and automation

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The company plays a leading role in the collection, processing, and access to digital data in various industries through suitable interfaces and communication protocols, and offers corresponding services for data analysis and processing.



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SKYABILITY GMBH



ORGANISATION PROFILE

Skyability delivers the best performance - always! Its incorporation in April 2015 launched an intensive planning phase, whose resolutions are still binding: to offer drone services in an industrial environment in a holistic way: from the preliminary discussion to the production, data delivery and post-project servicing. Skyability does not deliver demo flights but finished products that save customer's time and money, and improve safety. As a full-service provider, the company operates in airborne laser scanning, photogrammetry, inspection and thermography. The evaluation of data has the highest priority and needs first-class raw data.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

The expertise of Skyability lies in five specific application areas:

- inspection & Documentation of industrial plants, facilities, properties, wind turbines, and many more
- acquisition & Visualisation of 3D models
- thermography & thermal images for specific analysis of plants, special infrastructure, etc.
- high Density Airborne Laser Scanning and data processing
- unmanned Aerial Vehicle (UAS) operations in both mountain and urban areas.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Skyability is a pioneer in the safe measuring and excellent visualisation used for plants, buildings, property, and for many other applications. The challenge is to drive innovation combined with digitisation using the latest technology. Skyability is constantly developing innovative solutions to meet the needs of the region with its excellent services.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

As the digitisation enters more and more sections of industry, the natural stock of urban and rural areas more and more frequently becomes the object of high interest. Skyability uses multiple systems to collect gapless, high density point clouds of areas of interest to ensure the generation of digital elevation models and digital surface models with no undefined spots. The collected data comes from the best laser scanning system carried by Unmanned Aerial Vehicles (UAVs) with payloads up to 30 kg. These point clouds are used in such scenarios as flood protection analysis, spatial analysis, geological analysis, and archaeology.



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RMDATA GMBH



ORGANISATION PROFILE

rmDATA is a leading software company for surveying, geoinformation, geodata management, and reality capturing in German-speaking countries. The company was founded in 1985 and specialises in innovative solutions in geoinformatics. It focuses on smart and consistently user-friendly software. A team of over 90 employees develops software solutions and serves customers in Austria, Germany, Switzerland, Luxembourg, and Italy.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Expertise in:

- survey: cadastral survey, infrastructure survey, building surveying, observation surveying
- geoinformation: infrastructure management, land management, network management
- geodata Management: data migration, data verification, data analysis
- reality capturing: building measurement, terrain measurement

Services: product training, individual training, maintenance and support, software consulting and customisations.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Digital data and information are the basis for many services in the field of innovation, digitisation, and automation

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE WHICH

The company plays a leading role in the collection, processing, and access to digital data in various industries through suitable interfaces and communication protocols, and offers corresponding services for data analysis and processing.



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THE ASSOCIATED DIHS

DIGI HUB Südbaden is a contact point that supports small and medium-sized enterprises with the challenges of the digital transformation. Co-working in three different locations is a central aspect of DIGI HUB Südbaden's strategy.

It focuses on the following topics:

- Energy and resources
- Smart City
- Smart production
- Construction
- Health
- Trade and tourism
- Sensor technology IoT/cps
- Security and resilience

DIGI HUB Südbaden
<https://www.digihub-suedbaden.de/>



Industrial digitisation plays an essential role on national agendas as well as in the European 2020 Strategy. InnoSax SP, the Smart Production Systems Saxony Digital Innovation Hub, meets this challenge and combines the competencies for digital Saxony.

The DIH focuses on the following technology domains:

- Smart production systems
- IoT
- CPS
- Security & resilience support systems

Smart Production Systems Saxony - InnoSax
<http://innosax.de/>



AR-EXPERTS GMBH

ORGANISATION PROFILE

AR-Experts was born in 2016 with the mission of moving workers to the next level of performance. Since 2019 it has legally operated as a GmbH. Why are we here? Well, in the age of machines, the world is getting more and more complex. Workers are faced with more complex and continuously changing job descriptions. We help your workers to stay smart, instantly. With true to live solutions, easy to implement, fast ROI and fun to use.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

To all relevant manufacturing DAX and SMEs that have always wanted to go digital and never dared to: forget the old operating instructions that nobody reads or understands, and go digital. GIRI: a SaaS suit that allows you to create useful AR-based instructions the easy way, in just 90 seconds. The impossible made possible, Augmented Reality without the need for the middle man or an IT expert - just record and share!

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Bringing workers to the next level of performance. In the age of machines, the world is getting more and more complex. Workers are faced with more complex and continuously changing job descriptions. Today you need to know how to assemble an internal combustion engine. Tomorrow you will need to know how to assemble the new combustion engine and the electrical motor at the same time... and a hybrid one, and the fuel-cell-powered one and.... Today you need to know how to maintain a transformer station, tomorrow you will need to maintain a smart grid.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

GIRI's VALUE PROPOSITION - do in seconds what others do in days. Most prospects have done their homework and are embracing AR/VR for production and have experimented with these technologies. We are the only ones that get the desired "I didn't know it was so easy" mark. Use of AR - The benefits of using AR are clear as both empirical (BMW with a stopwatch in hand comparing state of the art systems with our AR), and academic (laboratory and scientific) studies demonstrate a 70% improvement in time and fewer mistakes on the way.



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TRUPHYSICS GMBH

ORGANISATION PROFILE

TruPhysics was founded in Stuttgart, Germany in 2015, its vision being to allow robots to understand our world, and to support mankind in our daily operations, both in private and business environments. Smart algorithms are crucial to solve tasks by handling known and unknown objects in an uncertain environment. Therefore, TruPhysics develops and provides an AI full-stack platform for smart robotics solutions including simulation, TruOS robot operating system, and a Skill Marketplace.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

TruPhysics has various Core IPs. TruOS is a robot operating system to control complete intelligent robotics systems with APIs to over 400 different robots, sensors, cameras, AGVs, etc. Using TruPhysics' patented simulation method, robots can learn new AI-based application skills for individual purposes faster and more reliably, and e.g. assemble parts or find the shortest routes in factories. The skill marketplace already includes over 50 robot skills, such as AI-based vision, mobile robot navigation, fleet manager, and CE-compliant hardware architectures (e.g. Robert M1 - mobile Robot, TruShelf - mobile multi-carrier system, and more than ten other solutions). New sensor types and hardware can additionally be integrated, and new skills and services developed.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Since humans take intelligent and flexible thinking, handling, and navigation for granted, it is not easy at all for robots in logistics and supply chain to solve complex tasks going beyond hardcoded patterns. Smart and flexible skills, such as navigation of mobile robots, and product handling in logistics require deep-tech algorithms and architectures. Our scalable robot platform improves our daily life and makes industrial processes more flexible and effective.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Within TruPhysics AI Platform, TruShelf is the product that shows our innovative approach best. It combines smart assembling of hardware components (mobile platform, lifter unit, and small conveyor belts) with smart software to control all components and optimise routes through swarm intelligence to transport small loads autonomously in the intralogistic process. TruShelf expands the degree of AMR use by bundling various transports into a single route. The lifting unit enables variable loading and unloading heights. Combined with TruFleet fleet management system for smart navigation, TruShelf is the ideal solution for efficient transport by small load carriers and for automated material supply to assembly stations and/or machines in intralogistics.



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BADEN CAMPUS

ORGANISATION PROFILE

As an innovation platform, the BadenCampus connects start-ups, medium-sized companies, municipalities, talents, and scientific institutions. Solutions for business and society are created in an inspiring working environment, via joint formats and on the basis of new technologies.

CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

Developing ideas - New technologies bring many opportunities for development. With suitable formats and a systematic analysis based on your goals, Baden Campus help to find the best ideas and set a clear direction.

Implementing innovations - The concrete development of innovations needs a clear methodical basis but also a fresh view from outside. Baden Campus ensures both through their implementation formats. Baden Campus helps businesses to implement promising innovations by means of systematic needs-dependent and methodical support via individual formats and also through corporate accelerator programmes.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Baden Campus plays a significant role in helping the region with digital transformation.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Technological change poses new challenges to a company's ability to innovate. It makes it capable of developing new solutions "ambidextrously", in parallel with its core business. Baden Campus helps businesses reflect on impulses for the digital transformation of their organisations and helps to derive and implement suitable measures, for example by developing a digital vision or implementing agile structures and tools such as OKR and/or Design Thinking.



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STEINBEIS 2I GMBH

ORGANISATION PROFILE

Steinbeis 2i GmbH was founded in 2016 as a 100% spin-off of Steinbeis-Europa-Zentrum (SEZ) and has offices located in Stuttgart and Karlsruhe (Germany). Steinbeis-Europa-Zentrum of the Steinbeis Innovation gGmbH (SEZ) belongs to the Steinbeis Foundation for Economic Promotion. The Foundation runs a network of approximately a thousand Technology Transfer Centres with the overarching aim to bridge the gap between science and application, turning R&D results into an actual economic advantage, and making a whole spectrum of the latest technology and management insights available to large companies, SMEs, and individual entrepreneurs alike.



CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

The core competences of the S2i team involved in the project are:

- vast experience in community building, foresight, roadmapping and outreach activities
- facilitation of networking among innovation actors
- advice for policy makers and administrations on regional future scenarios
- assistance in the exploitation of research results, in transnational technology transfer, in the stimulation and support of the innovation process in industrial companies, and in providing professional training
- expert knowledge in communication and dissemination of research and innovation projects.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

S2i is a member of regional European Enterprise Network (EEN) consortia. Its core activities are to manage and support international research and innovation projects, to stimulate and support innovation processes in both small and large companies, to coordinate foresight activities and exploit research results, and to promote transnational technology transfer.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

S2i has vast experience in road mapping, community building, networking, outreach, communication, dissemination, and exploitation activities, as well as in organising workshops, EU-wide conferences and brokerage events for technology transfer. S2i advises policy makers and administration on future regional scenarios, on innovation and cluster policy issues, and on support of knowledge exchange at European level.



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UHLMANN PAC-SYSTEME GMBH & CO. KG

ORGANISATION PROFILE

Uhlmann Pac-Systeme GmbH & Co. KG in Laupheim is a global leader in providing systems for blister and box packing and bottling of pharmaceuticals.

CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

Uhlmann has an extensive range of innovative products, which allows scalable networking from the machines right through to the cloud. This digital expertise also contributed to the fact that Uhlmann was able to continue to provide service-as-usual to customers while Covid-19 travel restrictions were in place.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The company offers flexible holistic solutions for international pharmaceutical companies, generic manufacturers, and contract packagers, and services boosting the digitisation of production and packaging processes.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Track & Trace by Uhlmann offers comprehensive solutions for tracking pharmaceuticals and medical devices. For every standard and norm worldwide, for product and process security from counterfeiting. Uhlmanns modular units for serialisation, labelling, and aggregation allow quick response time and flexibility while the specifications change. Uhlmann integrates suitable printing technologies, label applications, and inspection systems into each platform. The Track & Trace turnkey project management and specially developed software solutions are designed to be used across all production levels, up to direct connection to ERP and government servers.



UHLMANN GROUP

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FRAUNHOFER INSTITUTE OF MACHINE TOOLS AND FORMING TECHNOLOGY IWU

ORGANISATION PROFILE

Fraunhofer Institute for Machine Tools and Forming Technology IWU drives innovation in research and development of production engineering. Around 670 highly qualified employees at our locations in Chemnitz, Dresden, Leipzig, Wolfsburg, and Zittau tap the new potential for competitive manufacturing in automotive and mechanical engineering, aerospace technology, medical engineering, electrical engineering, and precision and micro engineering. They focus on components, processes, methods, and complex machine systems - the entire factory.



CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

The development of smart production devices and the optimisation of the related manufacturing processes make up the main research focus of the Fraunhofer Institute for Machine Tools and Forming Technology IWU, including research areas of mechatronics and smart factory applications.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Industrial production is the backbone of Germany construed as a business location. Comprehensive approaches and technologies are required to stay innovative and competitive. Thus, it is particularly important to develop new approaches to key challenges, and to combine them synergistically. Demographic developments, the increasing desire for individualisation, the changing need for mobility, and the role of humans in increasingly automated production are challenges that must be met on the route to production of the future and Industry 4.0.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The E³ Research Factory Resource Efficient Production, opened in 2014, serves as an example of Fraunhofer IWU's comprehensive approach. On an area of over 1600 sq.m, new technologies, production processes, and factory planning concepts are developed for energy- and resource-efficient production. The ideas are tested in practice with industrial partners. The E³ research factory serves as a platform for research and development where pilot applications and concepts of solutions are demonstrated and tested.



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VEMAS INNOVATIV MECHANICAL ENGINEERING NETWORK SAXONY

ORGANISATION PROFILE

From 1 January 2014 the VEMAS network established over 10 years earlier has continued as the VEMAS*innovativ* Mechanical Engineering Network Saxony. VEMAS*innovativ* serves as an open platform for technology and products for technology transfer, exchange of knowledge and experience, market development, and exploitation of synergies aiming at further development of products along the chain of added value.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

The focus lays on the initiation and support of product, process and technology innovations through joint projects, research associations, and technology transfer. Furthermore, the market development and initiation of cooperation in national and international markets are ensured, just like support for the recruitment of young talents and guarantee of skilled labour base.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

HMMI - Harmonisation of Human-Machine Interaction in Production.

If one looks at human-machine interaction in today's production environment, there is no such thing as harmonisation. Plant manufacturers use individual solutions, not least for cost reasons. In heterogeneous overall plants, there are therefore always structural breaks in the provision of data, processing and visualisation or interaction with humans in production. The users of the solutions developed in the project are enabled to operate complex production systems in a simplified manner by means of support functions, so that process reliability, product quality and productivity can be further increased. Workers will be enabled to act more independently and in a more goal-oriented manner.



DIGALOG INDUSTRIE- MIKROELEKTRONIK GMBH

ORGANISATION PROFILE

Founded in 1983 in Berlin, DIGALOG has focused its business on ensuring customer-specific control electronics for smart materials. “In a way, we are tailors for industrial applications”, explains Managing Director Martin Weber. Manufacturing such components calls for concentrated precision work. Each circuit board undergoes a visual and functional test before it is put into operation at the customer’s site, which allows almost service-free, long-term operation.

CLUSTER 3: #3D Printing, #Advanced & Smart Materials

FIELD OF EXPERTISE

The company from Berlin-Adlersdorf has set the goal of giving its customers a market advantage. For this purpose, the modules are equipped with a customer-specific hardware key. In this way individual, hard-to-copy products are designed, independent of the number of units. Moreover, they are subsequently supported throughout their service life.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Smart materials are initially passive materials that have to be physically activated in the application. DIGALOG carries this task in numerous projects. Its objective being the provision of high quality and better sustainability in electronics development, DIGALOG has succeeded in taking a decisive step towards energy efficiency, for example with the further development of high-voltage amplifiers for the control of piezoceramic actuators. They were also electronics developers in the Smart Tilting Systems project that entailed developing a method for the smart alignment of finishing units in metalworking processes. The position of the grinding tool is controlled with piezo actuators.



SCHICKTANZ GMBH SOHLAND/ SPREE

ORGANISATION PROFILE

SchicktanZ GmbH in Sohlund/Spree, a technology company operating in the field of injection moulding, is doing pioneering work in the introduction of smart materials into production. The company produces the housing shells for radio transmitters, e.g. ignition keys of many car brands, baby soothers, and components for medical devices to name only a few of their high-tech products. SchicktanZ has undergone a long development as a company, from the laundry button factory when it was founded 120 years ago to an innovative plastics processor. It has been family-owned at the start and again since 1990.

CLUSTER 3: #3D Printing, #Advanced & Smart Materials

FIELD OF EXPERTISE

SchicktanZ GmbH offers complete solutions in the field of plastics processing and toolmaking. The company also retains all relevant competences, starting with the design, via the development, to the assembly allowing the production of finished units and systems. A one-stop solution for all inquiries, SchicktanZ sticks to flat hierarchies, lean processes, short lead times, well-rehearsed connections, and high quality along the entire value chain.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

One of SchicktanZ's major projects is for a customer in the hygiene technology sector. In a specially equipped hall, the requirements of clean room production are optimally guaranteed. Special insect protection, lighting, ventilation technology, and twelve servo-hydraulic injection moulding machines for hygiene articles of various sizes are in operation day and night. In another project, SchicktanZ jointly developed a water sensor for the smart living sector, and built five moulds. In contrast to this project, designed for high volumes, batch sizes in agricultural machinery technology are in the range of a few thousand pieces. SchicktanZ was also able to develop the tool for the 2K electronic component housing, and now produces the components with a specially grained surface and assembles the display. Part of the company's experience goes back to its experience in the production of soothers for babies. Ten years ago, SchicktanZ still produced around 200,000 soothers a month. With the exception of the silicone soothers supplied, they injection moulded all the parts, printed them, assembled them by hand, and welded them together using ultrasound. Automatic production machines at the customer's site ensure that the number of pieces produced is many times higher than it used to be. Independent of that, SchicktanZ still takes on special series and creates print films for new decors.



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SMART³ | MATERIALS – SOLUTIONS – GROWTH

ORGANISATION PROFILE

Smart³ is an initiative of companies and scientific institutions aimed at developing new, innovative products based on smart materials. Engineers, designers, social and economic scientists, entrepreneurs, and technicians work together on the commercial breakthrough of smart products in a wide range of applications - from health to climate protection, from energy generation to production technologies, from lifestyle to mobility.

CLUSTER 3: #3D Printing, #Advanced & Smart Materials

FIELD OF EXPERTISE

Supported by the Twenty20 - Partnership for Innovation funding programme of the German Federal Ministry of Education and Research, the smart³ network has since initiated R&D projects in the fields of smart production, smart health, smart living and smart mobility. The thematic fields are supplemented by accompanying projects in the fields of interdisciplinarity & networking, and visibility & acceptance.

DESCRIPTION OF THE KEY CHALLENGE THE ORGANISATION IS KNOWN FOR ADDRESSING IN THE REGION OR FURTHER AFIELD

In order to help products based on smart materials achieve a commercial breakthrough, smart³ focuses on breaking through technological and organisational path dependencies. Changing both corporate and innovation environments requires that smart³ leaves the beaten track and its outdated structures. The network task is to identify the wide array of customer wishes and requirements, and to integrate them into future products. Furthermore, smart materials and their advantages are to be made better known to a broad range of users.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The Cumulino project is a smart product solution preventing skull deformities. It has developed an active positioning pillow that prevents skull asymmetries in infancy. The technology of Cumulino allows a noiseless and organic repositioning, standing in stark contrast to conventional alternatives with hydraulic, pneumatic or motorised systems. At the moment, the focus is on the further development of the idea, so that the product can come to the market and help patients. The idea can also be transferred to other areas.





THE ASSOCIATED DIHS

AFIL been recognised as a European DIH by I4MS. It has more than 150 members, mainly industrial companies, associations and public/private research centres. AFIL members are present in different areas and focused on a particular application field (advanced manufacturing). Their objective is to boost the international competitiveness of manufacturing companies in Lombardy, and especially the AFIL members.

The DIH focuses on the following technology domains:

- Digital and Intelligent Factory
- Material and Surface Treatment
- Additive Manufacturing
- Adaptive and Smart Manufacturing
- De- and Remanufacturing

AFIL
www.afil.it



Ecipa, a service provider of CNA for the North-East regions of Italy, was designated the managing organisation providing support to SMEs (mainly small and micro businesses) in their digital transformation, and given the task to be the “spider” in the network for facilitating innovation in October 2017.

It focuses on the following technology domains:

- Internet of Things (e.g. connected devices, sensors, and actuators networks)
- Data Mining, Big Data, Database Management
- Cloud Computing
- Additive Manufacturing (3D printing)
- ICT Management, Logistics and Business Systems

EcipaHub
<http://www.ecipahub.eu/>



JOINT LAB, APPLIED ROBOTICS RESEARCH CENTRE

ORGANISATION PROFILE

This hub of technological excellence in industrial robotics results from the collaboration of several units around Bergamo (Confindustria Bergamo, Intellimech, Kilometro Rosso, and University of Bergamo) with the Italian Institute of Technology (IIT) of Genoa, one of the main international players in researching robotics and industrial automation.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE: PRODUCTS AND SERVICES ESSENTIAL TO VALUE-ADDED BENEFIT

- Technology Transfer - to apply the most advanced robotic technologies, developed by IIT, to evaluate and demonstrate their validity in industrial environments
- Training - to encourage the transfer of scientific and technological skills of IIT to train high-level professionals, with advanced technical and scientific skills that can significantly increase the leadership in innovation.
- Enhancement of Technological Excellence - to promote the hi-tech quality of Bergamo's industry to further its diffusion in the world, through the use of easily communicable tools.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- flexible assembly and handling centre - easily reprogrammable robotic workstation capable of assembling and handling objects of different shapes, weights, and sizes
- remote control of machines and plants and remote inspection -transfer of visual-tactile feedback that allows the remote execution of such tasks as assembly, product evaluation, and driving vehicles, with manipulative capabilities to perform maintenance and repair activities
- virtual exoskeletons for remote manipulation - systems for the manipulation and lifting of heavy and/or dangerous objects, possibly located in hostile environments
- artificial intelligence for machine vision - intelligent vision systems, able to interpret the context and support decisions, for example in quality control and in monitoring and maintenance activities.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

- IIT SoftHand: anthropomorphic and adaptive hand
- CUFF: haptic display for force rendering
- Walk-man: humanoid platform with bimanual trunk
- Be-the-Bot: Example of a complete pilot platform with sensors for posture reconstruction



MIRAITEK S.R.L.

ORGANISATION PROFILE

Miraitek is the spin-off of Politecnico di Milano dedicated to the development of monitoring systems for industrial plants. The company provides solutions able to collect, read and analyse the operating data of production plants, transforming them into useful information to maximise the efficiency of production resources.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- development of advanced system for energy consumption monitoring
- development of advanced system for data collection and remote monitoring of industrial machinery
- implementation of predictive maintenance algorithms capable of analysing data to identify abnormal trends in working condition to decrease breakdowns and downtime, and increase production quality and plant availability.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Mirai4Machine is a modular software for real time monitoring. It enables pneumatic and electrical monitoring of the consumption of production resources; it also allows to store different type of data to compare historical performance of machines.

Mirai4Maintenance optimises production efficiency by increasing the plant life. It is a predictive maintenance tool that exploits data collected from the field (faults, stops, alarms) and processes them, identifying the best moment to intervene to avoid faults.



V-TECH, R&D DEPARTMENT OF VALTELLINA S.P.A.

ORGANISATION PROFILE

V.tech was founded by Valtellina SpA, as a research and innovation department in the field of telecommunications infrastructure. It acts as System Integrator and IoT General Contractor to manage turnkey requests, from feasibility plans to the installation of systems. V.tech's operations are articulated in different areas of technological and industrial progress: Industrial IoT, Smart Building, Smart City, Smart Road, Smart Manufacturing, Safety Application, and Cyber Security.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- development of projects and solutions in Industrial IoT, Smart Building and Smartcity Applications
- In particular, it proposes technological suites for the monitoring of processes in the energy, sensor, and industrial automation sectors
- development of ICT application solutions dedicated to the security of people and work scenarios, able to interact with IT organisations
- offering of IT and OT Cyber Security solutions: IT solutions are designed to protect data, users, companies, entities, and IT infrastructure. They are designed for IT security, prevention, data recovery, and preventive backups
- OT solutions are designed to improve the security of companies, and to ensure data protection.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

- remote control for industrial gas storage safety: a system that enables monitoring of the operating conditions of cryogenic containers and pressure vessels, as well as a number of gas plant operating parameters
- man down reporting app: this app signals that a worker may have experienced an impact and remains immobile for a certain time or assumes positions that can be considered abnormal for the work they perform
- IT security system for the airport: an advanced Cyber Security system automatically deconstructing an attack from the logical point of view, winnowing the useful information from the noise, indicating the interaction tree of the involved processes. It can also reconstruct the attack automatically from a temporal point of view, indicating the events that have been generated for each process.



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NEROSUBIANCO / NSB

ORGANISATION PROFILE

NSB is a consulting company founded in 2004 in Mantova, initially focused on local development projects. In 2013 it expanded its focus by adding technology innovation services with a focus on digital transformation of production processes. The permanent exchange with EU leading R&D and Technology Providers and the increasing demand for scouting and investment-oriented consulting services gave birth to a new dedicated engineering unit based on an innovative consulting method called FutureNow.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

NSB helps SMEs to understand if and how new production and digital technologies may improve their processes. This service is supported by SIM VSM, a SW developed by Simplan, which facilitates value stream mapping 4.0 and the analysis of alternatives to current production processes. NSB connects SMEs to R&D players and technology providers, and delivers rapid and effective Technology Scouting. Thanks to IGOR AI software, the team searches through millions of scientific articles, patents, and suppliers to provide the right information.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The economic strength of the Veneto Region is mainly based on the competitiveness of its SMEs that are facing the challenges of the 4th industrial revolution. SMEs are still struggling in keeping the digital investment pace of large enterprises, which is mainly caused by an unclear vision of:

- 1) how these investments should be managed and where they can lead to: indeed, while solution providers and fiscal incentives are pushing companies to adopt new technologies
- 2) the choice of technologies that will fit their purposes best: the range is increasing on a daily basis, while the capacity of SMEs to understand quickly what fits their shape best is still relatively low.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

SIM VSM is an application that supports SMEs in the preparatory phase to digital and smart factory investments. It generates and visualises value streams and provides dynamic evaluation of the modelled processes. This includes adherence to schedules, use of processes, bottleneck analysis, throughput, stock levels, and throughput times against the background of dynamic framework conditions in time. This analysis helps companies to figure out what has to be rationalised and improved before moving to a smart factory and its concepts driven by new investments even before such investments happen. On the other hand, IGOR AI helps to perform technology scouting processes quickly, and to identify which technologies fit the visualised process scenarios. From machinery to specific process technologies, IGOR AI can rapidly deliver an exhaustive list of state of the art technologies.



ATC, ADDITIVE MANUFACTURING RESEARCH CENTRE

ORGANISATION PROFILE

Additive Technology Center (ATC) is an experimentation and application additive technologies hub for the manufacturing industry. ATC is the first centre in Italy with a mission to enhance the knowledge and use of additive manufacturing technologies (including hybrid technology) that provides companies with the necessary technological contribution for the design of advanced solutions. ATC was born from the experience and synergy of three companies leading in their respective sectors: DMG MORI, a world leader in the production of machine tools GFM, industrial reality company specialised in the design, production, machining, and assembly of mechanical components ITEMA, a leading global provider of weaving solutions.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

- feasibility study and prototyping: the customer's idea is analysed and then verified in a test print to demonstrate the feasibility of the component
- pre-competitive analysis: cost analysis using tools developed in-house allows to make a cost assessment to let the client evaluate the sustainability of the project and the idea
- process development and optimisation: analysis and definition of the process of production of the designed component.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The ATC Technology Center combines several additive technologies in the metals sector, providing services on both direct deposition (DED) and powder bed (SLM) technologies. Thanks to these technologies and their combination with traditional processing, ATC can offer extensive freedom of development to meet the needs of engineering both in terms of materials and processes, reducing lead times and consequently also costs.



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UNISMART – FONDAZIONE UNIVERSITÀ DEGLI STUDI DI PADOVA

ORGANISATION PROFILE

UniSMART is a foundation of the University of Padua in charge of managing all the technology transfer and innovation consulting activities directed to companies, industrial associations, professionals, investors, banks, and other public and private bodies both on a national and international scale. UniSMART systematically assists its 5000 researchers from 32 departments and its 60,000 students in maximising the exposure of their research and talents, making sure they are both presented to the most relevant stakeholders to generate impact on the community.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

UniSMART possesses valuable know-how and expertise in the European research and innovation landscape, and has supported several R&D teams, technological ventures, start-ups and SMEs as well as large private and public organisations in the commercialisation of their research and innovation outcomes. Under these projects, UNISMART has successfully offered a considerable number of business support and innovation management services concerning the delivery of operational risk analyses, business modelling, business planning, market research studies.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The main challenge present in the region is the lack of interactions between the University and the private sector, mainly SMEs. This is an important issue because the University is not capable of providing all the resources it develops to SMEs in the region if they have no idea how to use them, and at the same time the University does not lend its ear to learn what the region actually needs. This means the University's activities are sometimes misfocused and SMEs are not able to harness the know-how produced by researchers. The region also risks the lack of specialised people in the job market because students and new talents are left behind and cannot develop the skills that local enterprises require.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The solution presented is an innovative start up created after the completion of a project proposed and managed by UniSMART. A multidisciplinary group of students investigated a new way to monitor the operation of systems for dispensing beer and wine, allowing a strict contact between the technology provider (partner of the initiative) and end users (i.e. restaurants, bars).

The digital innovation brought to this field allows strict control over all parameters to assure the high quality of the product and its safety. The monitoring allows operators to intervene with predictive maintenance and cleansing protocols before damages or the formation of bacteria and fungi occurs. The digital coordination optimises operators' interventions reducing costs of the service and systems' failures related to corrosive cleansing products.



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42BIT SRL

ORGANISATION PROFILE

42bit was founded by three partners with many years of experience in the field of web communication, new technologies research and development, and software programming for web based applications and mobile platforms. Established in February 2011, the company brings together the essential experience and customer portfolio of its members, and their different but complementary professional skills and experiences to provide its customers with a service that starts from a 360° analysis of consulting and business needs and leads up to the development and completion of the proposed solution. 42bit's mission is to offer integrated professional services to support businesses and professionals in the management of computing resources and their presence on the Net.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

A strategic provider of digital services, data mining, and cybersecurity experts, 42bit cooperates with SMEs to boost their digital innovation potential. 42bit offers its consultancy for implementation and management of information systems in general, and for configurations of servers and personal computers in particular, both for companies and organisations. 42bit provides Cloud Software for many SMEs in different fields: SicurCloud (online software for health and safety at work), Sherpa (a custom online ERP), SLIDES (a data mining project), and Formaweb (an online software for education processes).

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Innovation in the digital field is fundamental for the economic fabric of the Veneto Region, also with a view to foster competitiveness and sustainable development through the introduction of innovation in the digital field in a large number of SMEs. Among the macro trajectories set for the Veneto region RIS3 fine-tuning, and specifically for smart manufacturing, special attention is devoted to data analytics, modelling, and simulation. These are specifically mentioned among the tools that will allow to reach new organisational and productive models, sustainable productions and processes, advanced design and technologies for production, and cognitive systems and automation.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

42bit SRL is an innovative SME, which can now offer its customers a tailored 360° service that starts from consultancy and the analysis of business needs, and runs up to the development and customised finalisation of the proposed digital solution.



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BLUEWIND SRL

ORGANISATION PROFILE

Bluewind, an independent engineering company, provides innovative product design solutions in Electronics, Energy Efficiency, and Connected Devices. The R&D task force consists of over 20 experienced engineers, providing full product design and covering the complete design cycle: product strategy, hardware and software design, testing, CE compliance, and production. Founded in 1998, the company primarily serves the industries located throughout Europe and the US, offering wide experience in the automotive, industrial and medical industries.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

At Bluewind, cross-domain technology is the hallmark enabling innovation. Bluewind knows that a successful design usually focuses on usability and business model first, with technology following as support and key enabler.

A deep knowledge of the mix of technologies available for each specific requirement is then a key to the design success.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION (

To build the electronic part of modern products, as subcontractors in North East of Italy require more and more specialised skills in all known fields of applications due to a combination of:

- complex requirements caused by fierce competition from highly innovative companies in the Far East and the US new regulations for safety and security becoming compulsory, especially in transportation and medical equipment
- the availability of relatively cheap solutions for rapid prototyping and manufacturing that let many new corporations (also startups and scaleups) to develop not only software and platforms but also physical products like electrical vehicles and smart appliances (to name only a few).

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Bluewind helps SMEs upgrade their skills by working side by side in the most innovative developments. Thanks to an established network of links with the University of Padua and several semiconductor manufacturers in Europe, Bluewind is able to fast-start such new technological areas as functional safety, machine learning on the edge, cybersecurity for smes without any prior knowledge.



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ECIPA NORDEST HUB

ORGANISATION PROFILE

In 2017 Ecipa, a service provider of CNA (Confederation of Craft Trades and SMEs) for the North East regions in Italy, was designated the Digital Innovation Hub that provides support to SMEs in their digital transformation, acting as a “spider” in the ecosystem that facilitates innovation. It deals mainly with: awareness workshops about digital transformation potential, demonstration activities to approach digital technologies practically, education & training for SMEs to approach digital transformation, consulting services on how to introduce digital optimisation and/or innovation (support to move from TRL1 to TRL6), support in funding opportunities for digital innovation, and networking among relevant stakeholders. Ecipa Hub is funded by the projects carried out with and for the SMEs.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Ecipa Hub, mainly focuses on IoT, cloud computing, and 3D printing.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

SMEs are characteristic of the socio-economic fabric of the region, nonetheless, there is still a broad gap in the level of digitalisation (Digital intensity indicator) between large and small businesses. The RIS3 of Veneto recommends development of new models of industrialisation in the production of equipment and consumer goods, also through the digitalisation and circular economy processes. To face these challenges, Ecipa Hub focuses on Lean Manufacturing, Data Analysis, Change Management, Customer and Employee Engagement and exploits digitalisation through Internet of Things (e.g. connected devices, sensors), data mining, big data, database management, cloud computing, additive manufacturing, ICT management, logistics, and business systems.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Ecipa Hub has developed (and continues developing) a vast array of services tailored for the SMEs and their digital transformation needs to design their innovation paths together with them. Ecipa Hub’s services include: awareness creation, scouting and networking, digital maturity assessment, access to funding, education and skills development. The tailoring of its services is one of the hub’s main strengths, as it leads to customised innovation strategies adopted and implemented in real cooperation with the involved company, to improve its organisation management, market performances, and competitiveness.



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ICT FOR MANUFACTURING PROCESSES VENETO NETWORK (IMPROVENET)

ORGANISATION PROFILE

IMPROVENET is a regional cluster made up of the 4 Veneto universities, a group of manufacturing companies, service providers with high know-how and research entities keen on developing a path of innovation by investing in information technologies (ICT) that has operated in Veneto Region since 2017. It is represented by a consortium of private and public institution and enterprises. Its mission is to spread ICT technologies in the Veneto regional industrial fabric, to allow companies to be more competitive, productive, and responsive to market needs, enriching the processes and instrumental products with services, and to ensure maximum production efficiency.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

The main actions that IMPROVENET intends to implement are:

- implementation of pilot projects capable of quantifying the investments required to activate digital manufacturing innovation processes
- creation of construction paths and enhancement of the new skills required to face the innovation path, addressing the issue of operator training
- the establishment of a body to represents the region and its industrial fabric in national and international institutions, in this way also increasing the global visibility of local companies.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The need to embark on the path towards digital manufacturing is common to all manufacturing sectors. The key challenge is to spread ICT technologies in the industrial sector of the Veneto region, to allow companies to be more competitive, productive and responsive to market needs, enriching processes and instrumental products with services, to ensure maximum production efficiency.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The main innovative solutions can be summarised as follows:

- Predictive manufacturing techniques, with emphasis on maintenance of machinery and product quality control
- IoT methodologies for the innovation of machinery in the 3D printing sector
- Robotics for the safety of operators in the foundry
- Big Data and Machine Learning techniques in food production systems
- design of advanced human-machine interfaces (HMI) for industry 4.0
- development of platforms for integrated and innovative design.



ICT for Manufacturing Processes
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AI SENT S.R.L

ORGANISATION PROFILE

AI Sent is an innovative startup that brings innovation to Bergamo through Data Analysis, Machine Learning and Artificial Intelligence. The company deals with different areas of artificial intelligence, such as machine vision, anomaly detection, time series analysis, predictive maintenance, sound recognition, and text analysis.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- machine vision for anomaly detection in quality control and identification and tracking of objects and people
- time series analysis for predictive maintenance and sound recognition
- text analysis for the extraction of information from text and classification of documents.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

PeopleEngine is a product enabling the video monitoring of:

- numbers of people in restricted access areas
- distance measurement for monitoring crowds
- mask detection in critical locations
- heatmap generation for the right communication.





THE ASSOCIATED DIH

AmLab - Advanced Manufacturing Laboratory is the brand name of PBN Digital Innovation Hub. AmLAB is a service centre specialised on the application and presentation of most recent manufacturing technologies to develop smart end-user product in strong cooperation with our key customers. It is a tech-transfer spin-off company of Pannon Business Network (PBN). It is dedicated to be a training and research facility supplier of the manufacturing SMEs. Its objective is to translate the digitalisation vocabulary into tangible added value performance on the shop floor.

The DIH focuses on the following technology domains:

- 3DAnimation /3DVisualisation
- Collaborative Robotics
- Data Science (data analysis and analytics)
- AR solutions
- Indoor logistic services using drones

am-LAB
<http://www.amlab.hu/en/index.php>



IVY TECHNOLOGY AMS HUNGARY KFT.- SZOMBATHELY

ORGANISATION PROFILE

A leading global electronics repair and service provider to many of the world's largest tech, med-tech, and telco companies around the world, providing their customers with the best possible services and products resulting in optimal brand and product experiences. Its mission is to create value for clients and the clients' clients by the constant engagement of the company's key assets - the globally experienced team, innovative processes, strategic investments, and unwavering execution.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The Szombathely plant of Ivy specialises in complex repair functionalities. It requires high world-class engineering skills. They are absolutely necessary to handle the diverse portfolio of customers ranging from the computer sector, via payment systems, to medical technologies.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

There are two major problems that Ivy has to overcome. One of them is a shortage of qualified labour force and the second one is quality assurance. The labour force challenge is aggravated further by the fact that Ivy works on project basis, which means strong fluctuations in the required staff size, which is an obstacle in achieving employee satisfaction and loyalty. Product development support devices require special purpose equipment. However, due to the frequent project changes there is also a need for flexibility in the technical portfolio.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

As concerns labour force, Ivy is a leading player in dual education, and provision of engineering education in Szombathely. Ivy established an in-house research lab and delegated its best engineers to the R&D team. This special task force has recently developed multiple solutions, some of which have been patented.



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ADVANCED MANUFACTURING LABORATORY (PANNON BUSINESS NETWORK ASSOCIATION, AM-LAB)

ORGANISATION PROFILE

Am-LAB is the brand name of PBN Digital Innovation Hub. It is a service centre specialised in the application and presentation of most recent manufacturing technologies to develop smart end-user products in close cooperation with key customers. Am-LAB is dedicated to be a training and research facility supplier for manufacturing SMEs. Its objective is to translate the digitalisation vocabulary into tangible added value performance on the shop floor.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The technological competences of am-LAB:

- 3D scanning, modelling, 3D polymer printing
- prototyping, reverse engineering
- 3D animation
- Augmented Reality development activities
- collaborative robotics
- data analysis, unique algorithm solutions
- segmentation processes, data visualisation

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Operating in different areas, am-LAB, has established a continuous relationship with SMEs and the large enterprise sector. A need for a real-time display of data and statistics generated during production emerged, especially in the case of the large enterprises. The above is important as the fast and systematic presentation of data on several levels allows real-time production overview, and subsequently -quick interventions and quick decisions based on the real-time data that may support day-to-day workflows.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

To meet this requirement, the company has developed a mobile application that displays and offers access to the collected and organised data in augmented reality. On the server side, the company has created a lightweight data visualisation framework and a service that can query and map information from different data sources, and render the queried information into a form proper for the display device. The application contains templates that define the amount and type of data it expects and will display. Using labels on the machines, the client application identifies the device being viewed and posts a query to a REST API to determine which template needs to be loaded and what information it should contain. This content is displayed in AR, appearing as if in real space.



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BIOMATICS AND APPLIED ARTIFICIAL INTELLIGENCE INSTITUTION, JOHN VON NEUMANN FACULTY OF INFORMATICS, ÓBUDA UNIVERSITY

ORGANISATION PROFILE

Óbuda University constantly builds and develops a competitive institution of higher education meeting the criteria and regulations of the European Higher Education Area.

The mission of the university is to serve the economy through development and high-level knowledge transfer and innovation. The programme of education is balanced to meet the demands of long-lasting basic knowledge, up-to-date professional and practical knowledge, and the application thereof. The Óbuda University is the second largest technical university in Hungary. It focuses on robotics, biomedical engineering, cybersecurity, and AI. These research activities are organised in various institutions and catalysed by the University Research and Innovation Center.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

Offering more than just education, the University Research and Innovation Research Center is an organisation heavily centred on research and development. It focused on the integration of health IT, robotics, AI, and applied computer science.

The Competence Centres provide a continuous technology transfer between the world's leading companies and their faculty. Their centres contribute to continuous renewal of education, updating knowledge, and help to obtain certificates that are valuable on the labour market.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The R&D expenditure in the Western Transdanubian region amounts to 0.5% GDP. A level extremely low in Hungary, not to mention the EU. It is essential to increase the added value in the region to have competitive research labs, which is necessary to attract competencies from outside of the region. These competitive research labs will become enablers of applied research activity in the business sector.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The Óbuda University is one of the few Hungarian high-level education institution willing to set up dedicated infrastructure with human resources in the countryside.



ÓBUDAI EGYETEM
ÓBUDA UNIVERSITY

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FALCO FURNITURE CLUSTER

ORGANISATION PROFILE

The mission of FALCO Szombathely Furniture Cluster is to provide a network for wood and furniture manufacturing companies, research institutes, and professional and trade organisations, to support the innovation capability of the wood and furniture industries, and to provide the highest level of supplier responsibility. It intends to improve the innovation ability of furniture companies and to facilitate the exchange of experiences and the implementation of joint projects.

CLUSTER 1: #Digital Marketing, #Innovation in a Circular Economy

FIELD OF EXPERTISE

Falco Cluster is a dominant player in wood industry with heavy focus on R&D investments and government relationship. The company is committed to transform its ecosystem into value-added supply chain exploiting its resources. The ultimate goal is to establish a physical industrial park around a Falco plant.

Selected main tasks of the company:

- joint product and technology development
- encouraging joint investments and active participation in their development
- devising projects, joint R&D & I activities
- surveying and mediating the professional competences and the products of cluster members
- joint market actions, analysis, and research
- domestic and international tendering opportunities, monitoring of public procurement.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Around five years ago, the wood industry was thought to have been eliminated from the production landscape, just like the textile sector. FALCO, together with PBN and the University of Sopron, pioneered an initiative to reflect on this negative prejudice. The wood industry was considered a low added value, non-innovative sector, whose profitability was falling along the entire supply chain.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

A national platform was established by five players, and the Innovation and Action Plan was elaborated. It was submitted to the Ministry of Innovation, the efforts were acknowledged, and funds for education and innovation were delivered to the wood industry. FALCO is an initiator and a funding member of the national circular economy platform, whose driving force resulted in bringing the industry into the national agenda.



SCIENTIFIC ASSOCIATION FOR MECHANICAL ENGINEERING

ORGANISATION PROFILE

GTE (Scientific Association for Mechanical Engineering) is a public benefit association, and one of the largest scientific and community organisations uniting technical intellectuals. It currently has over 1000 individual and corporate members, and 27 divisions in all Hungarian regions, giving it unique country-wide professional coverage. GTE is the founding member of the Industry 4.0 National Technology Platform, and a member and representative of several other technical platforms. GTE's mission is to bring together professionals, companies, and organisations working in mechanical engineering industry and related fields, to develop their professional skills, and to support their activities.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

- education, professional training focusing on all fields of mechanical engineering
- consultation on special technical problems
- national membership, full territorial coverage
- professional team of engineers in all areas of the mechanical engineering industry, etc.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- helping youth talents in the region and the country
- enhancing the attractiveness of the engineering profession
- bringing professionals together into vibrant mechanical community
- enriching technical sciences with new solutions, etc.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Innovative solutions addressing the aforementioned challenge:

- organising the annual Formula Student Competition: Formula Student (FS) is Europe's most established educational engineering competition in 2020. Backed by industry and high-profile engineers such as Patron, Ross Brawn OBE, the competition aims to develop entrepreneurial activity and innovation in young engineers, and encourage more young people to take up engineering careers.
- providing access to leading technologies, e.g. through GTE, you can access to such services as mechanical materials testing, macro and micro hardness measurement, investigation of industrial failures (based on the know-how of the Budapest University of Technology and Economics).
- access to 3D printing in lab and test environments: GTE is at the disposal of its partners in such areas as tools and services supporting digital production, prototype production, and 3D printing in cooperation with its members and partners (e.g.: research institutes, universities). Furthermore GTE endeavours to add new technologies, products, and services to its portfolio.



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THE ASSOCIATED DIH

Hub4industry is a group of organisations with complementary expertise and a not-for-profit objective of offering a set of services to support the digital transformation of companies.

Hub4industry consists of the coordinating orchestrator (Kraków Technology Park) and consortium partners (technology companies: T-Mobile and ASTOR, AGH University of Science and Technology, and the Kraków University of Technology), specialists from the Construction Information Technology Cluster (BIM Klaster), and the Kosciuszko Institute. Together, hub4industry creates a one-stop-shop - a point of integration and standardisation of multiple competencies in the industry of the future.

The DIH focuses on the following technology domains:

- 5G Connectivity
- robotics and automation
- Artificial Intelligence
- Industrial IoT
- Cybersecurity
- BIM
- Cloud Computing
- Data Analytics
- 3D Printing
- VR/AR

hub4industry

<https://hub4industry.pl/en/>



ASTOR

ORGANISATION PROFILE

Since 1987 Astor has provided more than just technologies for IT systems for industry, industrial control systems and robotics, and business and technical know-how for Polish and foreign enterprises operating in industry. The company is present in seven Polish cities: Gdańsk, Katowice, Kraków, Poznań, Szczecin, Warsaw and Wrocław, and at scientific and popular-scientific workshops and events throughout Poland.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

Astor is one of the leading providers of solutions in the fields of automation, robotisation, and digital transformation of production processes in Poland, offering tested solutions. The company has experts in a number of industries, including furniture manufacturing, automotive, FMCG, metal processing, electronics manufacturing, and education.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Wiśniowski is a leading producer of gates and fences implementing a comprehensive solution being a robotised welding system combined with optimisation of order flow and processing.

Due to the broad range of the types and sizes of the fences installations produced, the process of automation was a very difficult project for the company, and was conducted in two stages. The first of them was completed in 2014/15, when the first workstation for robotised welding of fence systems for individual customers was created.

In 2016/17, the second stage was completed with Astor and the integrators, Zelcon and Acars: automation of welding for industrial fence systems, and robotised cleaning of oversize bar panels. Astor provided modern robots and control systems for the process of welding automation together with an added value: optimisation of the more extensive process, the control of the order flow and management, supporting Wiśniowski's strategy of complex customer care.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Solution: Astor Green Welding workstation developed by integrators, Zelcon and Acars, is based on two industrial robots Kawasaki RA006L dedicated to welding, and welding equipment produced by Fronius. The robots move along 17-metre track, which allows them to weld large-size gates. The robotic manipulators are installed on column-and-booms, which allows optimisation of work for efficiency and maximisation of the robots' reach. Moreover, the robots cooperate with Astor Green Welding positioners.

<https://www.youtube.com/watch?v=hIG2Q5AORlc>



COMARCH

ORGANISATION PROFILE

Comarch is one of the largest Polish IT companies. It was founded in 1993 and is listed on the Warsaw Stock Exchange. The company carries out projects for leading Polish and global brands in the most important sectors of the economy, including telecommunications, finance, banking and insurance, trade and services, infrastructure, public administration, industry, healthcare, and the sector of small and medium-sized enterprises.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The company's long term management is based on a few strategic pillars: profound and sustained investment in human resources, extensive R&D and development of own products, and the offer concerning products, industries and regions.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

With the focus on the changes introduced in Polish public administration, Comarch has produced a series of e-government solutions dedicated to the meeting of the specific needs of public sector agencies. These new technologies can contribute to making public administration processes more transparent and efficient. Each of these solutions has been developed according to the most recent and advanced international standards and is implemented by a team of most accomplished specialists.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Comarch offers an IT platform that allows for the “re-location” of medical care and administrative services. This simple and intuitive IT solution allows to deal with many matters in medical facilities. Patients of clinics and hospitals can use a computer or smartphone to send medical documents, results of measurement of basic vital parameters, and hold video consultations with physicians. In December 2020 that IT solution was extended as it was equipped with functionalities necessary to create a customer service model that reflects real service points, yet operating online, for the needs of the Polish Social Insurance Institution (ZUS, the state unit implementing tasks in the field of social security).



COMARCH

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FITECH

ORGANISATION PROFILE

Fitech is a privately owned company that has operated in Europe for 25 years. It has helped Tier 1 companies in their quest for production excellence by automating manufacturing processes and improving operations efficiency. Although Fitech's roots are in electronics manufacturing, its solutions and products are widely deployed in all production sectors. The company constantly invests and persistently expands its expertise in innovative technologies to offer the best industrial solutions aligned with the potential of Industry 4.0.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

Fitech's process automation systems allow manual, complex, and high precision tasks to be automated to secure process repetitiveness, accuracy, and high-quality final product. By responding to market trends and industry needs, the company aims to enrich their robotic solutions with technology innovations such as AI, using deep learning methods to make them self-reprogrammable and operatorless. Such an approach makes their offer a perfect fit for mass and high-mix, low-volume production.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Factories want to innovate their production in line with Industry 4.0 but are still wary about investing money in new technology solutions, especially when it comes to modernising entire production lines. They are more willing to start with a single process but are also aware of the fact that any modernisation/automation should follow a well-defined long-term plan. They need a strategic partner to prepare a complete and consistent plan, and gradually deliver tailor-made machinery that complies and smoothly integrates into a comprehensive production process.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Customers appreciate Fitech for being a first choice one-stop-provider of reliable, tailor-made, and affordable industrial solutions. Flexible and modular, the company allows its customers to extend successively their production lines with additional process automation systems, in line with production shifts and/or new business strategies. Moreover, such a production line can be transformed gradually into a smart production profile without the upfront need for investing significant sums. Fitech's IIoT connectivity enablers allow existing infrastructure to be quickly retrofitted before being replaced by modern machinery, e.g. AI-driven robots and optical inspection systems. The modules are standardised to fit together in any conditions and simplify integration as well as maintenance missions.



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ŁUKASIEWICZ RESEARCH NETWORK – KRAKÓW INSTITUTE OF TECHNOLOGY

ORGANISATION PROFILE

Łukasiewicz - Kraków Institute of Technology was established on 1 April 2020 as a result of a merger of two Kraków institutes that had been part of the Łukasiewicz Research Network: the Foundry Research Institute and the Institute of Advanced Manufacturing Technology. With their tradition and experience spanning decades, both the institutes created a strong unit, capable of taking on new challenges in the key development areas of the Łukasiewicz Research Network, i.e. health, smart mobility, sustainable economy and energy, and digital transformation - subjects of strategic importance for the Polish economy. The main aim of the institute is to solve the technological issues of partners operating in foundry, machining, automotive, aviation, chemical, pharmaceutical, and food industry.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

The institute employs highly skilled staff at three R&D centres: the Centre of Casting Technology, the Centre of Advanced Manufacturing Technologies, and the Centre of Materials Research, where key researchers generate innovative solutions in response to industry needs. The Centre of Testing Laboratories (incl. Accredited Bodies) equipped with unique testing devices, and the Office of Certification and Standardisation providing products, machines, and equipment certification services also operate at the institute.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Advanced engineering materials produced by classical methods emit high amounts of carbon dioxide and degrade landscape due to the mining of raw materials. The objectives of the proposed concept are to use metallic scrap containing highly valuable elements such as chromium, nickel, molybdenum, and vanadium to produce powder for additive manufacturing technologies and coatings deposition. Moreover, the idea fits the circular economy process perfectly well as it uses and processes Raw Materials in a rational way. As such a process is always destructive for the landscape and natural environment, it is essential to develop new technologies for the 21st century to minimise degradation of natural landscape and reduce carbon dioxide emissions. One of the ways is to recycle the materials already produced by humans, such as steels and nickel-based alloys.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

One way to develop new materials is to use post-processing chips of austenitic steels (i.e. 304L stainless steel: 18/10 Cr/Ni) and other materials such as nickel-based alloys with high chromium content. The produced powder can be used for development of coatings in the thermal spray process or powder produced from recycled steel and nickel-based scrap can be processed further as a powder for 3D printing technologies.



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WERNER KENKEL BOCHNIA

ORGANISATION PROFILE

The company started in 1979 with three workers and solid cardboard packaging production in a rented garage in Włoszakowice. Since then it has developed rapidly with a new generation taking control over the company in 2004 and fully computerising it; R&D departments were set up and a modern laboratory was created. By the end of 2020 there had been over 1,700 engineers and IT specialists in the entire group.

CLUSTER 4: #Data Analytics, Complex Simulation and Modelling

FIELD OF EXPERTISE

Werner Kenkel owns all printing technologies available in the market, and the use of multi-colour printing machines guarantees satisfaction of even the most demanding customers. Packaging aesthetics is also determined by the form and functionality. The company uses rotary die-cutters, highly automated slotting machines, and precise flatbed die-cutters. All complemented by specialised folding and gluing lines, connecting the parts of packaging with glue in multiple points; both hot and cold, with metal staples and/or professional tapes to carry out even the most complicated orders.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

One of the important technology challenges Werner Kenkel is tackling is the custom design of processes and machinery. We are looking for examples of innovation and new technology implementations that not only improve the process but also help the employer, employees, the local economy, and the environment. Another area of our interest is the transition to Industry 4.0 and the use of its concepts to offer added value to our clients, suppliers, and employees.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Werner Kenkel is involved in an acceleration programme that has given it the opportunity to verify usefulness, ease of use, and the added value of xR technology in Customer Service and internal training. Additionally we have access to knowledge and a showroom where the practical application of principles of Industry 4.0 can be demonstrated.



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THE ASSOCIATED DIH

Croatian Robotics Digital Innovation Hub (CROBOHUB), hosted within ICENT, is the key Croatian non-profit facility to support companies so that they could become more competitive by having their business/production processes improved, and products and services embracing digital technologies and robotic solutions.

CROBOHUB acts as one-stop-shop, helping Croatian and South-East European companies to digitise their business through efficient orchestrating of various stakeholders in a robotic innovation ecosystem including research institutions, business support institutions, and businesses operating in the field of robotics that may contribute to the development and application of advanced robotic systems in manufacturing. CROBOHUB also provides connections with investors, facilitates access to the financing of digital transformations, and helps to connect users and suppliers of robotic innovations across the value chain, and fosters synergies between digital and other key enabling technologies (such as biotech, advanced materials).

CROBOHUB

<https://www.icent.hr/en/crobhub/>



FACULTY OF ORGANIZATION AND INFORMATICS (FOI) – UNIVERSITY OF ZAGREB

ORGANISATION PROFILE

FOI is a higher education institution which has been internationally recognised in the interdisciplinary field of IT, organisation and business, and is renowned for its excellence in student education, research synergy, and professional and teaching activities, educating students to be competitive on the labour market so they can become the initiators of economic and social changes. FOI provides education to future experts in the field of information sciences and technologies, economics, organisation, communication, and other related fields.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

In over five decades, FOI has provided education to future experts in computing and technology, economics, information systems development, organisation, quantitative methods, applied foundations of information sciences, and information technology in business application. FOI experts boast rich project and research experience in many areas of ICT - Cyber Physical Systems/Internet of Things.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The challenge addressed by FOI is to create a strong pool of knowledge applied in IoT and robotics and to transfer solutions to SMEs and mid-cap companies according to actual market need, to increase their competitive added value.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Field of expertise:

- IoT and ways of delivering new knowledge within the domain and forming solid basis for future research, which can improve the efficiency and quality control of production processes in industry, reduce costs and produce better products
- Artificial Intelligence (AI) planning method: implementing several algorithms and demonstrating their applicability in the IoT context
- security and robustness of IoT networks research as a part of the effort to emphasise their non-functional properties with focus on the research into a new protocol that would enable encrypted, secure communication between individual “things” in the IoT, with better anonymity and privacy controls.



foi

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ICENT – INNOVATION CENTRE NIKOLA TESLA

(DATA ANALYTICS, FACTORY, INDUSTRIAL IOT, CIRCULAR ECONOMY)

ORGANISATION PROFILE

Innovation Centre Nikola Tesla (ICENT) is the leading constituent of the innovation ecosystem in Croatia for applied research and development in the field of engineering and related applications that lead Croatian society and economy towards competitiveness and sustainability. It is a non-profit institution whose function is to enable and accelerate commercialisation of new technologies important for the development of Croatian economy. It integrates scientific research, innovation and commercial processes for setting up new industrial technologies, products, services and business models.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The centre aims to become the leading Croatian research and development hub, particularly with its competences focused on electronics, design, computer engineering, information and communication technology, and related applications that drives the Croatian economy towards competitiveness and sustainability.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The centre is known for an integrated approach, promotion of the combinations, convergence and interactions between key enabling technologies that have effects in different innovation cycles and value chains whose research results could open the way to new industrial technologies, products, services, and business models in energy, environment, transport, space, health, and other respective areas the industrial sector is coping with. Furthermore, the most common reason why many innovations are not commercialised is the customer need for prototype and the accompanying production costs, which is particularly well visible in Croatia in the case of non-software products.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The centre offers innovative solutions in the following fields of research:

- Institute for Power Engineering - R&D activities related to renewable energy, energy storage technologies, energy efficiency, advanced power grids, and smart cities
- Institute for Robotics
- Institute for Biomedical Engineering
- Institute for Advanced Components Technologies
- Institute for Transport Systems



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MOBILISIS D.O.O.

ORGANISATION PROFILE

Business success story of Mobilisis began in 2005 with dedication to quality, satisfaction and meeting expectations of their customers, shareholders, employees, suppliers, and business partners. The company develops modern and innovative IT infrastructure for management of industrial and business processes as well as mobile data collection and transmission with emphasis on innovation, sustainable development, investment into education, quality, great care for the environment, and rational use of resources and energy.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

- solution design: system architecture, network design
- hardware developments: controllers, sensors, vehicle, terminals
- software development: cloud, web, mobile phone, apps
- connectivity: network management, SIM card management
- services: call centre, server hosting, software

KEY CHALLENGES ADDRESSED BY THE ORGANISATION

The key challenges the company is known for lie in four categories - Inetrnet of things, Internet of Data, internet of services, internet of people.

All the four categories focus on the following: delivering systems that offer complete and secure information lifecycle, developing security for connected devices and data transfer, making worldwide security protocols that provide everyday protection for machinery, operators and controlling business operability, designing end-user applications with powerful and flexible server platform, building platforms compatible with analytical data solutions, bringing simplified implementation and management via various sensors, devices and cloud infrastructures.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The system offered by Mobilisis has a wide range of applications, yet is primarily intended for companies utilising large vehicle fleets. It is not just real-time vehicle monitoring but rather an intelligent system for controlling, optimising, overseeing, and administration of vehicles in customer fleets. Carefully designed hardware and software components used in Mobilisis products allow flexible use in the most demanding business processes. Furthermore, Mobilisis offers high-quality products based on smart parking MagSense magnetic field sensor platform.



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XALAX D.O.O.

ORGANISATION PROFILE

XALAX Croatia is a technology-focused company and part of XAL, a large manufacturer of lighting solutions based in Austria. With offices in Varazdin, Croatia, and the Austrian city of Graz, XALAX helps companies automate their supply chains, digitalise processes, improve efficiency, understand data, and integrate modern cloud solutions. The company works with enterprises that want to have their manufacturing and warehousing processes integrated into ERP and MRP solutions.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

XALAX is an ERP service provider for Microsoft Dynamics solutions with expertise in: logistics and integration to warehouse automation, product change management, manufacturing international sales, production planning.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Some of the challenges that XALAX Croatia wants to focus on are:

- allowing companies to digitalise their processes further
- allowing companies a better control of production delivery times, costs, planning capacities, and warehouse automation integration
- integrating workforce to be more mobile and empowered
- being recognised for supply chain, manufacturing, and warehouse logistics knowhow.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The company presents production automation process that was built for XAL. To let its customers order tailor-made products, XAL has developed UNICO, an intuitive configurator, and introduced an automation system that transfers all unique order combinations into unique steps that a robot has to perform internally to complete the whole process. UNICO represents the solution of a unique level of production flexibility and gives customers a possibility to order a unique product with countless ordering options.



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WORK-ING D.O.O.

ORGANISATION PROFILE

The company deals with testing, design and assembly of solar systems, and design and production of low-voltage blocks for the needs of electricity distribution, industry and housing construction. Combining own developments with products of national and well-known European manufacturers, and with technical-commercial cooperation with Croatian and EU companies.

CLUSTER 2: #3D Printing, #Factory & Process Automation

FIELD OF EXPERTISE

Work-Ing is highly qualified in designing, construction, and testing of power plants with specialisation in solar power plants. It ensures complete service to customers including maintenance, authorised service of the equipment, and monitoring and emergency repairs in case of failure. In energy efficiency, Work-Ing offers a set of projects aimed at using the minimum possible amount of energy to carry out the same workload.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

Constant climate changes require production of food under controlled and protected conditions. This type of production is, however, complex and very expensive. Low-energy greenhouses use natural solar energy to produce plant varieties whose planting may be partially limited in areas with a likelihood of damage from frost, hail, etc. After irrigation, cultivation, and cooling, the excess photovoltaic energy is converted into thermal energy in multiple ways. Another problem in agricultural production is uncontrolled irrigation. As infrastructure is often unavailable as it is non-profitable in remote rural areas photovoltaic power is one of the most appropriate energy sources for water pumping. Another most widely used application of solar energy is to produce heat, which can be applied for various agricultural processes.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The concept of using photovoltaics for irrigation is based on the premises of no connection to municipal infrastructure and/or public grids, maximum energy, and investment cost reduction with general contribution to the lowering of carbon emissions, and with the possibility of irrigation during summer for periods exceeding 16 hours. Low energy greenhouses create optimal microclimate for plants, ensure the necessary energy for specific climate in plant production, and generate surplus energy. Further researches must be done to introduce new materials, research LED lighting for food production in closed spaces, and smart energy management systems. Photovoltaic systems are very economical in providing electricity in remote locations on farms, ranches, orchards, and in other agricultural operations. Calculation and construction of photovoltaic systems for agricultural production has to be tailor-made due to many factors that influence the production.



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THE ASSOCIATED DIH

The DIH Slovenia is a central national one-stop-shop to provide, connect, and support knowledge, business, and technology expertise, technologies, experimental and pilot environments, best practices, methodologies, and other activities necessary to allow the Slovene Industry build full digital competencies and innovation models and processes, support their digital transformation, and raise their competitive advantages based on the digital.

The DIH focuses on the following technology domains:

- digital and industrial transformation
- digital competencies building
- data management
- change management
- innovation in digitalisation.

DIH Slovenia

<https://dihslovenia.si/>



UNIVERSITY OF LJUBLJANA, FACULTY OF MECHANICAL ENGINEERING, LASIM LABORATORY

ORGANISATION PROFILE

In addition to the education of students at the University of Ljubljana, the Faculty of Mechanical Engineering (FEM) is closely connected to the industrial partners for whom it conducts educational workshops related to the FEM's R&D operation. FEM has successfully accomplished several industrial projects, some of which also result from student diploma theses. FEM's laboratory contains a modern production line with six smart assembly stations that can be reconfigured according to the order of assembly processes of products.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE:

LPM - LASIM Production Management Software connects all manufacturing process services (from engineering, via supply, warehouse, assembly, and logistics to management) to manual assembly process stations and enables Digital Lean optimised assembly processes: assembly material preparation, digital assembly instructions, online and real-time error solving, timing of assembly processes, project status overviews, etc.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

In Industry 4.0 FEM mainly focuses on the development of:

- digital twins
- design of smart decision algorithms based on AI technology
- new innovative strategies on how to implement new technologies into the existing production processes
- cloud computing, VR and AR technologies etc.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The purpose of demonstrating the concept of distributed systems is to show, in a real system, the flexible and agile capacity of a smart factory, which is primarily useful for small and medium enterprises (SMEs). The concept of distributed systems is based on several interconnected nodes, where each individual node captures local data and makes local decisions based on it. This allows control accessing the actual locations of the production process. The effects of the concept of distributed systems are reflected in a greater flexibility of the production process, shorter response times of individual subsystems, reduced delays in communication between subsystems, more agile solution of problems in the production process, and lesser processing power.



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TECOS SLOVENIAN TOOL AND DIE DEVELOPMENT CENTRE

ORGANISATION PROFILE

TECOS was set up by the government of Slovenia - Ministry of Economy, Chamber of Commerce - GZS, and the Municipality of Celje in 1994. Today TECOS operates on three dimensional assets, as an International Business Cluster, R&D Centre, and VET Institution, providing top level services not only for the TDM industry but also for all other manufacturing companies in Slovenia.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

Engineering services:

- turnkey product development
- optimisation of injection moulding
- casting and forming simulations
- structural FEM analyses
- 3D scanning and reverse engineering
- optical 3D measurement and inspection
- injection moulding services
- technology transfer.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

The key challenges the company is known for lie in ten areas:

- product development and errors elimination at early stages
- solutions for high quality and stable production
- 3D modelling
- development of turnkey solutions
- optimised use of material
- material processing technologies
- biodegradable, functional materials; light metals and composite materials development
- mechatronics
- advanced “Multyphysics” numerical analyses
- environmental impact assessments.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Decreasing product warping on an existing injection tool: numerical simulations made it possible to identify and eliminate quickly and cost-effectively the cause of excessive deformation to the sleeve. Using all the data received (3D product model, product material, tool construction, and technological parameters), injection moulding was simulated with Autodesk Moldflow Insight software package. It recorded the current situation, with the particular objective to match the results of the actual injected product. To obtain the most realistic results, a complete analysis (cooling, filling and subsequent pressure, rolling, and shrinkage) was carried out, which means that the final product method was used for the entire product (one cavity tool) and the tool together with the valve and tempering system. Numerical simulations make it possible to identify and eliminate quickly and cost-effectively the cause of excessive deformation to the sleeve. After the changes to the tool were made in accordance with the results of the simulation, TECOS provided a product within the prescribed tolerance field.



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JOŽEF STEFAN INSTITUTE, DEPARTMENT OF SYSTEMS AND CONTROL

ORGANISATION PROFILE

The roots of this unit are in the Institute's Electronics Department, which was founded and advanced in the 1950s by the late Professor France Bremšak. In 1986 an independent Department of Computer Automation and Control was formed. In 2003 the department was renamed the Department of Systems and Control. Its mission is to perform technologically oriented research, and transfer the knowledge and results to practical applications so as to contribute to the progress in Slovenia.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

The activities of the Department of Systems and Control include analysis, control, and optimisation of various systems and processes, specifically:

- researching and developing new methods and algorithms for automatic control
- development of procedures and software tools
- development of special measuring and control modules
- design of computer aided systems for control and supervision of devices

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

- control and optimisation of complex systems
- detection and localisation of faults in technical systems and processes
- computer integrated production
- support and implementation of technologies for control systems
- device and product development.

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

The INEVITABLE Innovative Action intends to develop a fully digitalised monitoring technology for an optimised and improved performance of manufacturing processes. It studies the use cases from the energy- and resource-intensive steel and nonferrous metals sectors. The developed high-level supervisory control systems for different production plants and for the demonstration in operational environment (TRL 7) enable autonomous operation of the processes based on embedded cognitive reasoning. INEVITABLE improves the capabilities for reliable and real-time control logics of final product properties and process efficiency to increase the flexibility of plant operators. Improved and flexible production performance with a simultaneous reduction of resource consumption and carbon emissions is expected, contributing to a more competitive and sustainable metal industry in the EU.



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JOŽEF STEFAN INSTITUTE, DEPARTMENT OF AUTOMATION, BIOCYBERNETICS, AND ROBOTICS

ORGANISATION PROFILE

The research conducted by the department covers topics that deal with the characteristics of human movement and its connection with the environment, e.g. machines and/or technological processes. The results of this research are used in industrial automation and robotics, as well as in various branches of medicine and in sports. In addition to basic research in these areas, the department endeavours to conduct research that allows immediate transfer of the acquired knowledge and technologies to users.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELD OF EXPERTISE

This department develops and manufactures electrical stimulators that are used worldwide. Recently it has focused most of its research on the treatment of patients with respiratory disorders, working with the Golnik Lung Disease Clinic. The results will be used for bioreflexion and reduction of activity, relaxation, and/or blocking of abdominal muscles during respiration.

KEY CHALLENGE ADDRESSED BY THE ORGANISATION

With this programme the department established and supported an innovative environment among recognisable actors in Slovenia, thus creating and developing key enabling technologies (horizontal knowledge networks) connected to vertical value chains (with associated markets). Top products and services require top research competencies, capacity, and significant investments, which (as the experience of GOSTOP programme shows) urgently need to be supported by the state, with an emphasis on continuity, which is sorely lacking. The success of such programmes apparently requires an excellent foundation in basic research (TRLs 1-3) with appropriate modern research equipment. As a logical continuation of the programme, coordinated activities in the form of commercialisation projects (TRLs 6-9) should follow. Therefore, the programme meticulously monitors and supports the Strategic Research and Innovation Partnership Factories of the Future (SRIP FoF).

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

A key achievement of the GOSTOP programme is the parallel emergence of multiple new research groups, especially in the industrial environment. The experience and results of the GOSTOP programme will undoubtedly make a positive contribution to the further implementation of SRIP FoF activities continuing the S4 programme, and to further transformation and penetration of the Slovenian industry with new products, services, and technologies of factories of the future.



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JOŽEF STEFAN INSTITUTE, DEPARTMENT OF INTELLIGENT SYSTEMS

ORGANISATION PROFILE

The main goals of the Department of Intelligent Systems are research into computer foundations of intelligence, and development of advanced applications in smart information services, data analysis, intelligent web research, decision support, intelligent agents, medicine, ecology, language technologies, smart manufacturing and economics. With more than 20 years of tradition in research and development in the wider field of artificial intelligence, intelligent systems, medical IT, natural language processing, and cognitive sciences, the Department of Intelligent Systems has established itself on a European and global scale.

CLUSTER 0: #Data Analytics, Complex Simulation and Modelling, # Industrial IoT, #Factory & Process Automation

FIELDS OF EXPERTISE

- inductive logic programming
- evolutionary computing
- multi-strategic learning and principles of multifaceted knowledge
- web data mining
- synthesis of knowledge for modelling and control systems
- decision support systems
- principles of intelligence and cognitive sciences
- intelligent agents and multiagent systems
- artificial intelligence in medicine
- speech synthesis
- ontologies and the semantic web
- gameplay analysis.

KEY CHALLENGES ADDRESSED BY THE ORGANISATION (REGIONAL LEVEL)

- ambient intelligence
- computational intelligence
- agent and multiagent systems
- machine learning and data mining
- natural language
- games and search

INNOVATIVE SOLUTIONS RESPONDING TO THE REGIONAL CHALLENGE

Xperience studies generative mechanisms of key importance for increasing bandwidth and speed of cognitive development. Current artificial cognitive systems are limited in this respect, as they cannot yet make efficient use of such generative mechanisms for the extension of their cognitive properties. Xperience will address this problem by applying structural bootstrapping, which is a method of building generative models, leveraging existing experience to predict unexplored effects of actions and to focus the hypothesis space for learning novel concepts. This developmental approach enables rapid generalisation and acquisition of new knowledge and skills from little additional training data.



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SUMMARY AND NEXT STEPS

S3HubsinCE partnership successfully implements a model that promotes value-creation for its RIS3 Champions based on needs determined in interviews carried out earlier in the project. Thanks to involvement of key stakeholders: entrepreneurs, universities, BSO and regional authorities the Technology and Policy Blueprint have been jointly developed. It is a digital transformation roadmap with a set of recommendations to bridge the gaps in digital transformation by following champions who play a crucial role of lighthouses by delivering know-know, sharing the experience, and presenting industrial use cases to make Europe even more competitive, resilient, and sustainable.

During the project RIS3 Champions take an active role in innovation in the Central European ecosystem by:

- sharing their know-how and presenting their use cases within S3HubsinCE online community
- providing webinars and study visits (due to Covid-19 restrictions, mainly in the virtual form)
- involvement in transfer and cooperation actions aimed at generating a narrative demonstrating the project, and creating close-to-market value-added benefits for RIS3 champions
- participation through virtual or physical presentation at the 2nd Foundation for Future Foresight Forum (regional event) to demonstrate connection and active engagement with the concept of “champions”.

The jointly created Constellation of CERIS3 Excellence will support promotion and dissemination of coordinated bottom-up and market-focused information and awareness raising actions, and bring networks of CERIS3 Champions closer to the target groups and market through such activities as the RIS3 Investment Forum that will be organised in Kraków in November 2021.

The S3HubsinCE project serves the creation of a common transnational vision and framework to foster digital transformation of European entrepreneurs, based on Digital Innovation Hubs. The key role in successful implementation of the vision belongs to the RIS3 champions who are well positioned to be drivers of the change and respond to the ongoing digital challenges of the future. Boosting the growth of SMEs, large enterprises, and universities and research institutions together with the intensification of transnational cooperation and trade, and bringing innovation and digitalisation to traditional sectors will bridge the gap between mature competitive companies successfully operating on the European market and those that lag behind. RIS3 champions will play a role of lighthouses showing the direction towards digital transformation and making Europe more resilient, competitive, and green.

Direct cooperation and action plans undertaken by the partnering DIHs in seven countries are the core goals and the real tangible effects of building strong innovation network of partners ready to implement joint strategies, action plans, and Transnational Policy & Technology Blueprint for CERIS3 Excellence.

If you would like to learn more about project and its partnership, please go to project website where you will find all our publications <https://www.interreg-central.eu/Content.Node/S3HubsinCE.html>

PARTNERSHIP



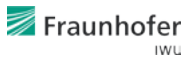
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More information about the project and our activities:
www.interreg-central.eu/Content.Node/s3hubsince.html