

OUTPUT FACT SHEET

Tools

Version 2

Project index number and acronym	CE1492, 4Steps
Output number and title	Pilot actions of testing innovative ICT application
Responsible partner (PP name and number)	Vorarlberg University of Applied Sciences, PP04
Project website	https://www.interreg-central.eu/Content.Node/4STEPS.html
Delivery date	03/2022
Summary description of the key features of the tool (developed and/or implemented) and of its transnational added value	

Within the Interreg Central Europe project 4Steps (Towards the application of Industry 4.0 in SMEs, CE1492), project partner n° 4: Vorarlberg University of Applied Sciences has developed the Digital Innovation Hub entitled “Business Intelligence & Innovation” to experiment, co-create, innovate, etc. artifacts (e.g. tools, methods, processes, etc.) to launch the digital transition to become a Smart Service Factory (of the Future). The Hub is implemented as a university support center for business and industry in the Vorarlberg region (and its neighboring regions) to research about and test innovation and technology collaboratively and cooperatively. The Hub shall connect stakeholders from business, industry, government, society and academia to co-create, network, discuss and assess the future of business and industry within the context of the digital transformation: Industry 4.0 and its progress towards the paradigm of Industry 5.0 and Society 5.0. In doing so, the Hub provides five key features - main services - that are about artificial intelligence, innovation management & research, system collaboration / eco-system collaboration, resilience engineering and (research) methods & tools. In the field of Artificial Intelligence, members of the Hub develop, analyze and investigate algorithms for Machine Learning and data-driven problems. The endeavors include modelling, simulation and optimization for Evolutionary Algorithms Design, Computational Intelligence, Remaining Useful Life, Natural Language Processing and Machine Learning. Service Innovation research & management is addressing the challenge to make regional systems within businesses, industry, society and government more innovative and competitive, especially by maximizing their innovation potential. A central role is the extensive linkage of actors within innovation ecosystems through establishing quadruple helix clusters/networks. This interconnection facilitates the development and implementation of new participatory methods and tools to engage end-users - as well as citizens - in innovation processes. The application of service (scientific) methods and tools enable the conduction of structured innovation workshops and events with the pro-active inclusion of all stakeholders. Centre to service resilience engineering is the Strategic Management Framework to Engineer Organizational Robustness and Resilience (Maurer, 2020). It enables to design and engineer innovation to prevent, to respond to and to cope with organizational risks and crisis. The DIH and its service were designed and developed as response to the political, economic, social and environmental needs to facilitate a collaborative innovation platform within the region of Vorarlberg as well as an interface between business and industry within academia. The Hub is conceptualized and implemented as a “living platform” and consists of a physical and a digital infrastructure for the networking and matchmaking of the Hub stakeholders and target groups.

NUTS region(s) where the tool has been developed and/or implemented (relevant NUTS level)

The design, development and implementation of the Digital Innovation Hub on Business Intelligence & Innovation happened within the Federal State of Vorarlberg, Austria. Vorarlberg - AT34 comprises the following NUTS codes:

- Bludenz Bregenzer Wald AT341
- Rheintal-Bodenseegebiet AT342

Since the Federal State of Vorarlberg is embedded into the international region of the Lake of Constance, further NUTS regions and their systems that could take advantage of the Hub are, for example: LI000, DE13, DE14, DE27, CH053, CH054, CH055, CH056.

Expected impact and benefits of the tool for the concerned territories and target groups

The Digital Innovation Hub on Business Intelligence & Innovation is designed as tool to support (regional) business and industry in their endeavors to digitize its systems and sub-systems. In doing so, business and industry find an anchor point where technology, emerging trends and challenges as well as innovation can be discussed and tested. Furthermore, the Hub allows its stakeholders to co-create and exchange knowhow, experience and best practices. Expected effects within the region of Vorarlberg are Collaborative Innovation Engineering (in collaboration with research and academia), Integrated Systems Thinking (removal of island mentality and establishment of vertical and horizontal supply chain/value chains), Cooperative Technology Assessment/Technology Impact Assessment and the continuous exchange and discussion about emergent trends and challenges. Beneficiaries of the Hub are the local business and industry that are willing to cooperate among vertical and horizontal systems and its entities. But also, the Hub will interconnect itself with international Hubs to integrate and disseminate international knowledge and expertise. The Hub addresses the Vorarlberg's Smart Specialization Strategy "Intelligent Production". It is expected that the Hub can contribute to a more efficient and effective manufacturing and production industry within the region (and beyond).

Sustainability of the tool and its transferability to other territories and stakeholders


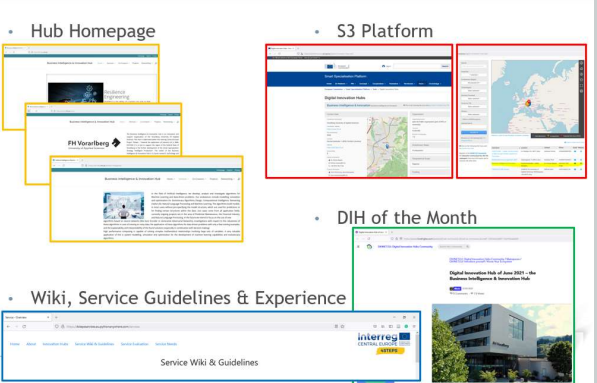

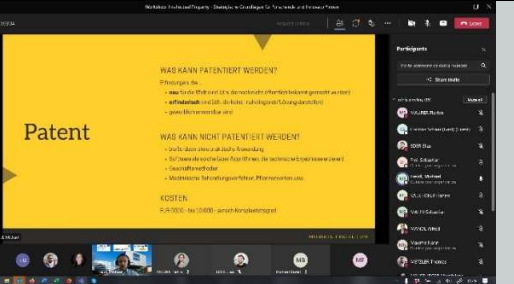


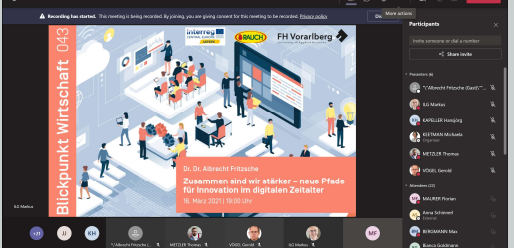

The DIH on Business Intelligence & Innovation is open for the "general public" and is published and promoted on the S3 Platform of the European Commission. This platform provides a good durability of the established Hub by the interconnection with other Hubs in Europe. Additionally, this platform enables high visibility not only to other international DIH's but also to potential (new) service clients and customers. Due to the (scientific) publication activities within the 4Steps project, such as in IEEE, Springer, Scitepress, etc., the DIH on Business Intelligence & Innovation provides the uptake of the results (*especially by scholars and students*) and its implementation in other territories. Furthermore, follow-up project proposals with the Hubs target groups are developed and submitted, such as: JIDEP & SusChain (Horizon Europe), Concept Hub & AlpDrive (Alpine Space), etc. The national connection with the Austrian Promotion Agency and national Hubs, especially the DIH West, is actively pursued. The DIH's homepage is online and accessible via biih.labs.fhv.at; interested parties can access the homepage and get information about the services and can get in contact with the DIH management. Additionally, the Hub's transnational network is presented at: 4stepsservices.eu.pythonanywhere.com/hubs; From the academic perspective, the DIH on Business Intelligence & Innovation is introduced within the academic network RUN-EU and will be actively pursued within this network.

References to relevant deliverables and web-links


If applicable, pictures or images to be provided as annex



Within the 4Steps project, the team of the DIH Business Intelligence & Innovation contributed to all tasks and deliverables. However, since some deliverables are more general and do not have that much impact on the design and development of the Hub, others have. These deliverables are, for example:

Deliverable	Title	Relevance	Link
D.T1.1.3	SMEs check-up Implementation	moderate	
D.T1.2.1	Mapping Report the 9 elements of Industry 4.0 compared to SMEs need in each RIS3 region	moderate	
D.T1.2.2	Transnational SMEs of the RIS3 clustering in relation to the 9 I.4. pillars	moderate	
D.T1.2.3	I4.0 supporting tool catalogue	moderate	
D.T1.3.3	TML Report	high	
D.T2.2.1	Regional workshops: Digital skills for all	high	see below (pictures)
D.T2.2.2	Regional workshops: Digital skills for the labour force	high	see below (pictures)
D.T2.2.3	Regional workshops: Digital skills in education	high	see below (pictures)
D.T2.3.1	Definition of new services for the DIH	high	
D.T2.3.3	Transnational Digital Innovation Hub	high	
D.T3.1.4, D.T3.2.3, D.T3.4.5, D.T3.5.3, D.T3.6.3, D.T3.7.4	Pilot reports	Moderate	
D.T3.3.1	Prototype of smart service factory of the future	very high	https://biih.labs.fhv.at/
D.T3.3.2	Smart service factory development	very high	https://biih.labs.fhv.at/
D.T3.3.3	Pilot report	very high	https://biih.labs.fhv.at/
D.T3.8.1	Transnational workshop for the pilot evaluation	moderate	https://4stepsservices.eu.pythonanywhere.com
D.T3.8.3	Transnational tool of innovative services	very high	https://4stepsservices.eu.pythonanywhere.com
D.T3.8.4	Transnational Report of innovative services	very high	https://4stepsservices.eu.pythonanywhere.com
D.C.2.2	Media involvement	very high	see below (links & publication)
D.C.3.2	Pamphlet on the Transnational Action Plan	moderate	
D.C.5.1 - D.C.5.3	Local focus groups year 1, 2 & 3	very high	see below (pictures)

<p>DIH Physical Infrastructure</p> <p>PHYSICAL APPEARANCE</p>  <p>2019 2020 2021 Spring 2022</p>	<p>DIH Digital Infrastructure</p> <p>DIGITAL APPEARANCE</p> <ul style="list-style-type: none"> • Hub Homepage • S3 Platform • DIH of the Month • Wiki, Service Guidelines & Experience 
<p>Impressions</p>	
	
	
	





Interreg Alpine Space  

This project is co-financed by the European Regional Development Fund through the Interreg Alpine Space programme

20 octobre 2021 / October 20th 2021
A-RING ALPINE TRANSNATIONAL LIVE LEARNING
Charbonnières-les-Bains & Virtual

Evenement en français et anglais / *Event in French and English*

PROGRAMME :

9h00 : Session d'ouverture - Polymeris
9h30 : Présentation des initiatives régionales
10h30 : Présentation du « Campus du numérique » - Christophe MENANTEAU, Directeur exécutif du Campus Région du numérique
11h15 : Présentation de Dedicatèd - Laurent VOLLE, Directeur Entreprise Europe
12h00 : Synthèse de la session
12h30 : Pause du midi
14h00 : Présentation de SWARM - Ramzi ABBES, Directeur des Opérations
14h30 : Présentation de Polytronics - Polymeris
15h00 : Présentation de Minalogic - Elvir MUJIC, Program Manager
15h30 : Présentation du Lab01 et du network Vulca - Isabelle RADTKE, Fab manager
15h45 : Session de discussion ouverte entre les partenaires et les participants
16h00 : Clôture du webinaire

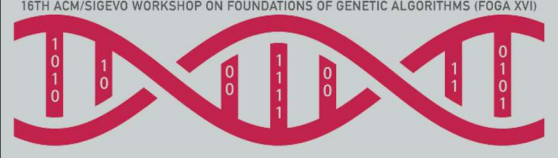
9.00am: Opening session - Polymeris
9.30am: Presentation of regional initiatives
10.30am: Presentation of the « Campus du numérique » - Auvergne-Rhône-Alpes Region - Christophe MENANTEAU, executive director of Campus du numérique
11.15am: Presentation of Dedicatèd - Laurent VOLLE, Director Entreprise Europe
12.00am: Wrap up of morning session
12.30am: Lunch break
2.00pm: Presentation of SWARM - Ramzi ABBES, operations director
2.30pm: Presentation of Polytronics - Polymeris
3.00pm: Presentation of Easytech - Elvir MUJIC, program manager
3.30pm: Presentation of Lab01 and Vulca network - Isabelle RADTKE, Fab manager
3.45pm: Session of open discussion between partners and participants
4.00pm: Webinar closing


INSCRIPTION REGISTRATION




FOGA 2021

16TH ACM/SIGEVO WORKSHOP ON FOUNDATIONS OF GENETIC ALGORITHMS (FOGA XVI)







interreg CENTRAL EUROPE **4STEPS**

TAKING COOPERATION FORWARD

4Steps International Conference „Best Practice Day“ (online)


DIH in Austria and efforts of FHV: towards a Hub for Business Intelligence & Innovation - Smart Manufacturing of the Future


Vorarlberg University of Applied Sciences, Dept. Business Informatics, Dr. Florian Maurer

Thursday 23 July 2020

Venue: online, zoom <https://us02web.zoom.us/j/89133669613>

TIME	CONTENT
11:00	WELCOME Luc Scherber, BWCON
11:10	Interreg Central Europe „4Steps“: Towards the development of the first Digital Innovation Hub in Vorarlberg Florian Maurer, FH Vorarlberg - Preliminary research: BIGCALIS - The 4Steps project - Key enabling technologies - Q&A
12:00	CONCLUSION






FACTORY OF THE FUTURE
Path towards digital transformation

- Broad repertoire of strategies and activities
- Serviceification -> inclusion of customers (and other business stakeholders into manufacturing processes), customer satisfaction processes, (cross-)sector interaction and co-creation
- Organizational environment -> supplier interaction, strategic partnership and alliances, new business models
- New and changed processes and routines -> additive manufacturing processes, Big Data and data analytic processes, automation/robotization of processes
- New and changed resources -> exchange of old technologies

THINK COOPERATION FORWARD







Business Intelligence and Innovation:
an European Digital Innovation Hub to increase System Interaction and Value Co-creation within and among Service Systems

Florian Maurer
Vorarlberg University of Applied Sciences
Department Business Informatics

Industrial Challenge, Research Motivation, Research Question

- Small and medium-sized enterprises need to cope with the Digital Transformation
- Many organizations act in a generalist manner
- Innovation is not only a technological, knowledge, but also a process challenge
- Design & development of an digital innovation hub for the region, which is not only a technical but also a process challenge
- How can digital innovation hubs for the manufacturing industry within the region of Vorarlberg be designed & implemented?

Theoretical Underpinning & Contextual Embedding

Service Science & Work System Theory
Service Ecosystem

- Analyze & design an ecosystem of digital technology, operations and information
- Develop an ecosystem of digital technology, operations and information
- Develop an ecosystem of digital technology, operations and information
- Develop an ecosystem of digital technology, operations and information
- Develop an ecosystem of digital technology, operations and information

Industry needs & vision towards the Digital Transformation

Industry 4.0
Digital Transformation
Agile Production
Service Ecosystem
Service Interaction

Conclusion

- Confirmed positioning of the internal and external environment
- Identified value chains, systems & services
- Identified cooperation advantages of digital technology & service interaction

INSTICC
Institute for Systems and Technologies of Information, Control and Communication

Best Poster Award Certificate

for the paper entitled:
Business Intelligence and Innovation: An European Digital Innovation Hub to Increase System Interaction and Value Co-creation within and among Service Systems

authored by:
Florian Maurer

received at the
10th International Conference on Operations Research and Enterprise Systems (ICORES)
held from February 4 - 6, 2021

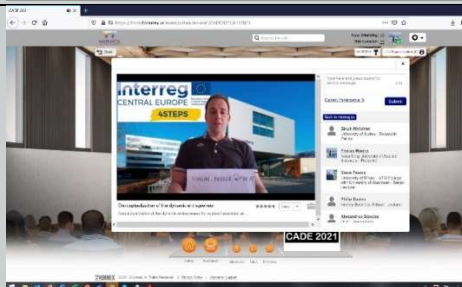
On behalf of the Organizing Committee,
Greg H. Parlier
Greg H. Parlier
ICORES Program Co-chair

e-mail: secretariat@insticc.org website: <http://www.insticc.org>



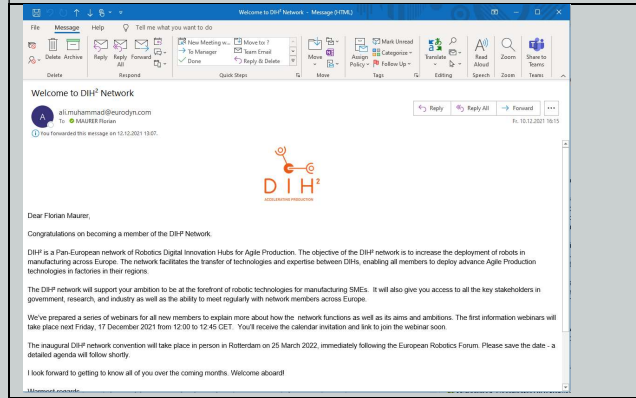
Robust and resource-efficient cooperative exploration and mapping using homogeneous autonomous robot teams

Vorarlberg University of Applied Sciences, Department Business Informatics, David Hutter



Zoom Meeting: <https://join.zoom.us/j/92027471182>

Participants: Greg H. Parlier, Florian Maurer, David Hutter, etc.



Welcome to DIH² Network

Dear Florian Maurer,

Congratulations on becoming a member of the DIH² Network.

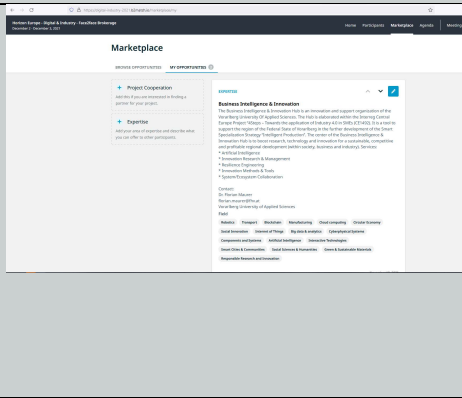
DIH² is a Pan-European network of Robotics Digital Innovation Hubs for Agile Production. The objective of the DIH² network is to increase the deployment of robots in manufacturing across Europe. The network facilitates the transfer of technologies and expertise between DIHs, enabling all members to deploy advanced Agile Production technologies in factories in their regions.

The DIH² network will support your ambition to be at the forefront of robotic technologies for manufacturing SMEs. It will also give you access to all the key stakeholders in government, research, and industry as well as the ability to meet regularly with network members across Europe.

We've prepared a series of webinars for all new members to explain more about how the network functions as well as its aims and ambitions. The first information webinars will take place next Friday, 17 December 2021 from 12:00 to 12:45 CET. You'll receive the calendar invitation and link to join the webinar soon.

The inaugural DIH² network convention will take place in person in Rotterdam on 25 March 2022, immediately following the European Robotics Forum. Please save the date - a detailed agenda will follow shortly.

I look forward to getting to know all of you over the coming months. Welcome aboard!



Marketplace

Business Intelligence & Innovation

The Business Intelligence & Innovation Hub is an innovation and support organization of the Vorarlberg University of Applied Sciences. The Hub is located within the existing Center for Digital Innovation. The Hub is dedicated to the development of digital innovation hubs for the manufacturing industry. The Hub is dedicated to the development of digital innovation hubs for the manufacturing industry. The Hub is dedicated to the development of digital innovation hubs for the manufacturing industry.

Videos:

Business Intelligence & Innovation: a Digital Innovation Hub
<https://www.youtube.com/watch?v=fiWqXwHma0I&t=9s>

Digital Twin technology-based Decision Support System
<https://www.youtube.com/watch?v=oPY1j1FLwP0&t=10s>

CADE2021-FMaurer-Schumpeter-vonFoerster

https://www.youtube.com/watch?v=0xzu619G_OM

ICORES FMaurer Video

<https://www.youtube.com/watch?v=l87eieUUTfE>

03 FMaurer

<https://www.youtube.com/watch?v=rkYxLW37O8g&t=30s>

01 JSchumacher

<https://www.youtube.com/watch?v=kl1NvWyVMlc>

02 MHellwig

<https://www.youtube.com/watch?v=ENpP2kHB8pQ&t=135s>

Publications

VHB Verband der Hochschullehrer für Betriebswirtschaft e.V. (= the largest community for professors and lecturers within the field of business, economics and information systems)	Call for inspirations: What contribution can business administration make to the successful resolution not only of company-specific crises, but also of larger crises in the corporate environment? What ways and answers does business studies have at hand to deal with crises and to use inherent opportunities? How do crises change research and teaching and what do we learn from them? https://vhbonline.org/ueberuns/vhb100-call-for-inspirations	2020	https://vhbonline.org/fileadmin/user_upload/VHB_crisis_resilience_FM_AF_final_2.pdf
Scitepress	The purpose of the International Conference on Operations Research and Enterprise Systems (ICORES) is to bring together researchers, engineers, faculty, and practitioners interested in both theoretical advances and practical applications in the field of operations research. Two simultaneous tracks will be held, covering on one side domain independent methodologies and technologies and on the other side practical work developed in specific application areas. https://icores.scitevents.org/?y=2021	2021	https://www.scitepress.org/Link.aspx?doi=10.5220/0010255602080217
IEEE	in this years edition of the ICE/IEEE conference, we have invited the growing ICE/IEEE community of researchers, innovators, industrialists, engineers and practitioners to share their insights, practices, projects and case studies that address the conference theme: "Innovation, Technology, and Engineering Management for our Societal, Environmental, and Economic Resilience"	2021	https://ieeexplore.ieee.org/document/9570119
IEEE	The 27th ICE/IEEE International Technology Management Conference is a place where research, science and innovation is called for original ideas, papers, debates, initiatives and projects. Authors, workshop / tutorial organizers, and participants are invited to contribute to the shaping of the prospective on engineering, technology and innovation solutions for industry and societal challenges. https://www.ice-conference2021.org/	2021	https://ieeexplore.ieee.org/document/9570240
IEEE	Competitive Advantage in the Digital Economy (CADE 2021)	2021	https://ieeexplore.ieee.org/document/9650936

Springer International Publishing	Smart and Sustainable Collaborative Networks 4.0 22nd IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2021, Saint-Étienne, France, November 22–24, 2021	2021	https://www.springerprofessional.de/business-intelligence-and-innovation-a-digital-innovation-hub-as/19865112
International Symposium on Logistics	Supply Chain Networks vs Platforms: Innovations, Challenges and Opportunities	2019	https://isl21.org/wp-content/uploads/2020/04/Full-paper-20_07_2019-Final-V2.pdf
RUN-EU General Assembly	Innovation Conference Run-EU Innovation Hubs https://run-eu.eu/2021/10/26/first-run-eu-general-assembly-will-take-place-in-ireland/	2021	ISBN 978-1-9196081-0-5
FHV Research Newsletter	Research Newsletter April 2021	2021	https://www.fhv.at/4steps/
FHV Research Newsletter	Research Newsletter April 2020	2020	https://www.fhv.at/forschungsnews/2020/apr/digital-innovation-hubs/
Homepage Logistics Research S3 Platform of the European Commission		2019	https://www.lra.at/?page_id=8
DIHNET.eu	Digital Innovation Hub of the Month June 2021	2021	https://spaces.fundingbox.com/spaces/dihnet-community-dihnet-eu-introduce-yourself-1/60de0cdd89116a059aae8a89