Smart4Europe2

Catalysing Digitisation throughout Europe

Deliverable 5.5

Report on training activities

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[1] R=Report, DEC= Websites, patents filling, Ethics, ORDP: Open Research Data Pilot, etc., O=Other

[2] PU = Public, CO = Confidential, only for members of the consortium (including the Commission Services)

Acronyms Listed in Document	
CSA	Coordination and Support Action
DIH	Digital Innovation Hub
DoA	Description of Action
EC	European Commission
EIT	European Institute of Innovation & Technology
IA	Innovation Action
ICT	Information and Communication Technologies
H2020	Horizon 2020
KET	Key Enabling Technologies
KIC	Knowledge and Innovation Community
KPI	Key Performance Indicator
RTO	Research and Technology Organisation
SAE	Smart Anything Everywhere
SME	Small and Medium-sized Enterprise
STEM	Science, technology, engineering, mathematics
WP	Work Package

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Executive Summary

In the context of Smart4Europe2's work package 5, the present deliverable D5.5 reports the activities and results achieved by Smart4Europe2's task 5.5 focused on skills and training during the second period of the project.

Specifically, it illustrates the ongoing collection, organization and dissemination of trainings by Smart4Europe2, SAE Innovation Actions and other sister projects (e.g., I4MS) to address the skill needs of the three main target groups identified by Smart4Europe2, i.e., SMEs, students and DIHs.

Additionally, the deliverable describes the connections Smart4Europe2 created with other relevant actors and initiatives active on future skills and education/training-related topics in the European arena (e.g., METIS Erasmus+ blueprint, Fit4FoF, EIT, etc.).

Finally, it highlights some first opportunities coming from the new EU funding programs that have been already exploited to further advance the up-/re-skilling of the current workforce as well as the preparation of the next generation of EU entrepreneurs, managers and workers.

1   Introduction

The successful development and implementation of digital innovations and the full realization of digital transformation processes in companies brings an associated need for new knowledge and skills. Unfortunately, in Europe, the availability of the necessary skills is one of the top barriers for companies, especially SMEs, that want to embrace new technologies in products, processes and business models.

To contribute to address the above-mentioned challenge, within Smart4Europe2 work package 5, task 5.5 is focused on education and training, and it is aimed at addressing SAE-related knowledge and skills of both the current and future workforce.

Accordingly, the present deliverable D5.5 follows up the information reported in D5.4, which was submitted in December 2020 (M12), and it reports the activities and results achieved by Smart4Europe2 in the second period of the project.

Specifically, Chapter 2 illustrates the ongoing organization, collection and dissemination of trainings by Smart4Europe2, SAE Innovation Actions and other sister projects (e.g., I4MS) to address the skill needs of three main target groups described in D5.4, namely: 1) Entrepreneurs, managers and workers, especially those employed by traditional SMEs and mid-caps but also digital technology frontrunners; 2) Academia students and researchers, willing to combine top technical education with innovation and entrepreneurship; 3) Representatives of Digital Innovation Hubs that play a central role in fostering the broad uptake of digital technologies by industry.

Similarly, as already highlighted in D5.4, the focus of Smart4Europe2's task 5.5 has been mainly on hard/technical skills related to the SAE technological areas of cyber-physical and embedded systems, customized low energy computing powering cyber-physical systems and the Internet of Things, flexible and wearable electronics and organic large area electronics. However, it has also included innovation, business and entrepreneurship-oriented activities that are relevant to make progress and succeed in the digitalization journey.

In addition, Chapter 3 describes the connections Smart4Europe2 created with other European education/training initiatives as well as the actions performed to strengthen the collaboration on future skills and education/training-related topics between the SAE ecosystem and other relevant actors in the European arena.

Finally, Chapter 4 highlights some further opportunities coming from the new EU funding programs that have been already exploited to further advance the up-/re-skilling of current workforce as well as the preparation of the next generation of EU entrepreneurs, managers and workers.

2 Education & Training actions in 2021

TARGET: SMEs					
SOURCE	**DOMAIN**	**TYPE**	**TITLE**	**CONTENT**	**LINK**
Smart4Europe2	Technical/ Business	Webinar	SAE Digital Training Session	In this dedicated training session, you will find out more about the SAE Initiative, its aligned Innovation Actions, selected Success Stories for different application areas but also what the SAE Market Place can do for you	https://smartanythingeverywhere.eu/wp-content/uploads/2021/08/SAE-Training-Session_July2021.pdf
SmartEEs2	Technical	Webinar	PrintoCent webinar series 2021	Printed Intelligence Fast Forward Printed Intelligence Breaks Through with Advanced Manufacturing Substrates Coatings & Inks the Key Enablers of Intelligent Products EU-Decochrom Interactive Printed Graphics New Horizons for Antennas Future Rapid Diagnostics	https://smartees.eu/all-events/
SmartEEs2	Technical	Webinar	Success Stories from EU-Smartees	EU-Smartees project with comprehensive consortium from research and business has been running since 2017 promoting and stimulating the progress for Flexible & Wearable Electronics applications.	https://youtu.be/uH-Sy-W8b3E
SmartEEs2	Business	Webinar	JIC webinar about SmartEEs2_How to innovate with flexible electronics?	JIC, a South Moravian Innovation Centre, organizes a webinar with participation of AMIRES, a business coaching partner of SmartEEs2 project. The webinar is for Czech SMEs and Mid-caps and it is focused on the operation, rules and possibilities of using the SmartEEs2 program.	https://smartees.eu/jic-webinar-about-smartees2_how-to-innovate-with-flexible-electronics/
SmartEEs2	Technical	Webinar	"Printed Sensors and Biosensors"	n this webinar two basic printed sensors to meet this challenge are presented: colorimetric and electrochemical devices. It will be also shown the process development involved in sensors' design,	https://smartees.eu/all-events/

				detection methods and fabrication methodologies all based in scalable automated printing techniques such as screen-printing, inkjet-printing, spray-coating and slot-die.	
SmartEEs2	Business	Webinar	"Is Paper the future of Electronics?"	Gaël DEPRES, Central R&D Manager at Arjowiggins will touch on how circularity can drive an industrial group towards innovation. He will address the printed electronics issue and how paper can become an alternative to plastics.	https://smartees.eu/digital-event-is-paper-the-future-of-electronics/
SmartEEs2	Technical	Webinar	Sensing Technologies and Devices in Flexible Form	The webinar will focus on: Printed Electronics, Sensing Technologies, Printed Sensors, Applications Innovation Opportunities	https://smartees.eu/webinar-sensing-technologies-and-devices-in-flexible-form/
SmartEEs2	Technical	Virtual Tour	Virtual Tour	Take a tour through SmartEEs Labs and learn more about technologies that can be used for printed and flexible electronics: CEA, VTT, IMEC, FEW, etc	https://ecosystem.smartees2.eu/repository/?filter_category[]=4&gen
DigiFed	Technical	Webinar	DIGIFED Digitising Europe's Industry together III Technical Offer 1	In the webinar, Digifed's technical partners presented their technical offer.	https://digifed.org/2021/04/12/attend-the-new-digifed-webinar-series-on-the-3rd-open-call-and-the-new-digifed-app/
DigiFed	Technical	Webinar	DIGIFED Digitising Europe's Industry together III Technical Offer 2	In the webinar, Digifed's technical partners presented their technical offer.	https://digifed.org/2021/04/12/attend-the-new-digifed-webinar-series-on-the-3rd-open-call-and-the-new-digifed-app/
DigiFed	Technical	Webinar	How to tackle security challenges of IoT	Contents: impact of cybersecurity in IoT, how hackers attack IoT networks, modern mechanisms to keep the IoT secure.	https://digifed.org/2021/05/18/register-to-the-how-to-tackle-security-challenges-of-iot-digifed-webinar/

BOWI and Tetramax	Business	Webinar	SME experiments as a way to forge collaborations and support regional adoption of digital technologies	In this workshop, two EU projects – BOWI and Tetramax – presented their respective approach to support uptake of digital technologies across Europe. Participants learned about the approach of both projects in supporting SMEs, how regions can be involved and hear from SMEs.	https://bowi-network.eu/events/sme-experiments-as-a-way-to-forge-collaborations-and-support-regional-adoption-of-digital-technologies/
Tetramax	Technical / Business	Webinar	Technology Transfer Experiments in the TETRAMAX and BOWI Projects	The Webinar took place on a special Industry Day at Embedded systems week and aimed at increasing interactions between embedded system researchers and practitioners in academia and industry. TETRAMAX and BOWI talked about technology transfer experiments, the result of collaboration between academic researchers and small or medium enterprises in different EU countries.	https://www.tetramax.eu/news/163/tetramax-and-bowi-industry-session-at-embedded-systems-week/

Table 1 Training targeting SMEs

D 5.5

Smart4Europe2 has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No. 872111.

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TARGET: STUDENTS/RESEARCHERS					
SOURCE	DOMAIN	TYPE	TITLE	CONTENT	LINK
Smart4Europe2	Technical	Open day	I4.0 Lab Visit	Within the framework of the POLIMI OPEN LAB initiative, a series of guided visits to the Industry 4.0 Lab were organized at the School of Management of POLIMI to bring visitors of all ages closer to scientific culture. During the visit, participants had the opportunity to learn how a production line powered by artificial intelligence works, current research results and future skills needed in industry 4.0.	https://www.eventi.polimi.it/events/polimiopenlabs-industry-4-0-lab-11-09/
Smart4Europe2	Technical	Seminar	Human centric Industry 4.0	The seminar for students of the digital and sustainable manufacturing course at POLIMI is focused on human-centric and sustainable production models enabled by digital technologies.	N/A
SmartEEs2	Technical	Virtual Tour	Virtual Tour	To take a virtual tour through SmartEEs Labs and learn more about technologies that can be used for printed and flexible electronics at CEA, VTT, IMEC, FEW, etc.	https://ecosystem.smartees2.eu/repository/?filter_category[]=4&gen
Smart4All	Technical	Summer School	CPS&IoT'2021 Summer School	Main purposes: 1. Advanced training of industrial and academic researchers, developers, engineers and decision-makers; academic teachers, Ph.D. and M.Sc. students; entrepreneurs, investors, research funding agents, and policy makers; and other participants who want to learn about CPS and IoT engineering; 2. Dissemination, exchange and discussion of advanced knowledge and project results from numerous R&D projects in CPS and IoT; 3. Promotion and facilitation of international contacts and collaboration among people.	https://embeddedcomputing.meconet.me/ss-cpsiot2021/
TETRAMAX	Business	Summer School	TETRAMAX Summer School at ACACES21	Three courses on entrepreneurship: 1. Entrepreneurship for scientists considering forming an innovative new venture - 2. Entrepreneurial finance - 3. Intellectual Property Rights as a Business Tool	https://www.tetramax.eu/news/164/the-last-tetramax-summer-school-at-acaces21/

Table 2 Trainings for students and researchers

TARGET: DIGITAL INNOVATION HUBS

SOURCE	DOMAIN	TYPE	TITLE	CONTENT	LINK
Smart4Europe2	Technical / Business	Webinar	SAE Digital Training Session	In this dedicated training session, you will find out more about the SAE Initiative, its aligned Innovation Actions, selected Success Stories for different application areas but also what the SAE Market Place can do for you	https://smartanythingeverywhere.eu/wp-content/uploads/2021/08/SAE-Training-Session_July2021.pdf
Smart4Europe2, Smart4All and DIH4CPS	Technical / Business	Hybrid workshop	DIH Joint Workshop	The current phase of the SAE ecosystem development is focused on consolidating collaboration amongst SAE stakeholders. This is an opportunity to share experiences and experimentation, learn from other programs and collaborate on future ideas.	http://dih-workshop.upv.es/registration/
Smart4Europe2	Business	Webinar	European Digital Innovation Hubs and support projects	During this workshop, different initiatives and projects will present their offer and opportunities available for candidate European Digital Innovation Hubs (EDIHs).	https://digital-strategy.ec.europa.eu/en/events/european-digital-innovation-hubs-and-support-projects
BOWI	Business	Webinar	"EDIH Heatmap" Information and Exchange webinar	This webinar was organized by DIHNET, Vanguard and BOWI. EDIH consortia could learn about the EDIH Heatmap, a structure to discuss the strengths and gaps in the consortium and to develop a competence profile.	https://digital-strategy.ec.europa.eu/en/library/edih-heatmap-information-and-exchange-webinar
European Commission	Business	Webinar Series	Cycle of workshops on European Digital Innovation Hubs	A cycle of webinars is organized by the European Commission to clarify issues related to the European Digital Innovation Hubs restricted call.	https://digital-strategy.ec.europa.eu/en/news/cycle-workshops-european-digital-innovation-hubs

Smart4All	Technical / Business	Online workshop	SMART4ALL 1st Joint Workshop	A Joint workshop with Digital Innovation Hubs and other SAE Initiatives was held in June '21.	https://www.youtube.com/channel/UCwmSl9LCl2vNBO-3k75dvJA/videos
BOWI, I4MS	Business	Webinar	Boosting Digital Transformation. Which are the challenges for your region?	Digital transformation is a priority for all European regions, but there is a diversity on specific regional implementations. The Talk will be complemented by the I4MS Working Group meeting. We will identify key changes to facilitate digital transformation, especially in the regional ecosystems.	https://i4ms.eu/event/boosting-digital-transformation-which-are-the-challenges-for-your-region/

Table 3 Trainings for DIHs

The collected training activities were advertised on the SAE innovation portal and social media, and a dedicated section of the SAE Marketplace was constantly updated to provide the users – especially Digital Innovation Hubs, SMEs and mid-caps - with relevant information about skill development opportunities and available online learning materials. The dedicated section can be reached at the following link: https://saemarketplace.eu
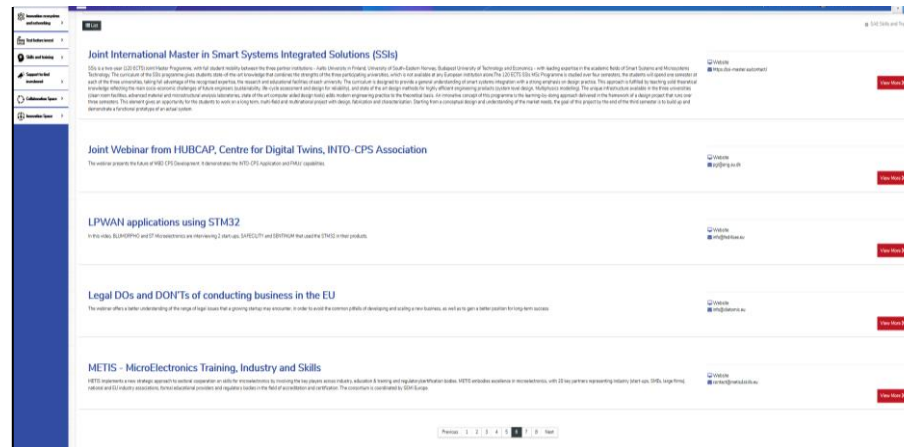

Figure 1 Trainings in the SAE marketplace

3 Collaboration with other EU initiatives on skills and trainings

3.1 METIS: Microelectronics Training, Industry and Skills

METIS project - https://www.metis4skills.eu/ - co-funded by the Erasmus+ programme and coordinated by SEMI Europe, implements a new strategic approach to sectoral cooperation on skills for microelectronics by involving the key players across industry, education & training and regulatory/certification bodies. Together, the consortium will develop skills intelligence, introduce innovative curricula and establish sustainable governance structures.

The project has a 3-step approach:
1) **2025 Microelectronics Skills Strategy**
   • Highlight skill mismatches between the industry needs and the current educational provision
   • Define the jobs of the future and monitor progress in microelectronics skill needs
   • Create an Action Plan with targeted measures for the implementation of the strategy
2) **METIS Curriculum and Training**
   • Develop the METIS curriculum and training in three areas: systems design, semiconductor design and basics of manufacturing
   • Combine blended learning (traditional and online delivery), as well as work-based learning
   • Validate the training in real-life scenarios in industry and education settings
3) **Observatory & Skills Council**
   • Introduce structured frameworks for exchange between industry and education players
   • Monitor skill needs in the microelectronics sector and update the METIS curriculum
   • Launch thematic groups targeting specific trends and challenges (e.g. AI, connectivity)

A meeting between Smart4Europe2 representatives and the METIS coordination team was organized in June 2021 to exchange information about the two projects and explore collaboration opportunities. Afterwards information about METIS were published in the SAE Marketplace and the connection between Prof. Krammer Olivér (METIS) and Prof. Marta Rencz (SAE) from BME was established to follow up and cooperate for the creation of METIS courses. The two projects will also remain connected in 2022 and METIS trainings (when ready) will be shared with IAs and other stakeholders of the SAE ecosystem.

3.2 Fit4FoF

Steinbeis is one of the partners of Fit4FoF and has created the bridge between the project and Smart4Europe2. FIT4FoF project - https://www.fit4fof.eu/ - aims at addressing workers' needs, analysing technology trends across 6 industrial areas of robotics, additive manufacturing, mechatronics/machine automation, data analytics, cybersecurity and human machine interaction, to define new job profiles, which will inform education and training requirements.

FIT4FoF has developed a new education and training framework, which places workers (women and men) at the centre of a co-design and development process that recognises and addresses their skills needs. By applying educational approaches based on Communities of Practice, FIT4FoF aims to

empower workers to be drivers of the design, development and delivery of their own upskilling programmes. Two main results are: the "ICoED" process and the "Skills4.0 - Upskilling Analysis Tool".

The "ICoED" process is focused on the co-design and the developing of training programs. It is especially interesting for people working in the Manufacture Industry and people working with upskilling and teaching/education in an industrial setting.

The "Skills4.0 - Upskilling Analysis Tool" is free to use and free of charge, and provides access to four main sections: Trends, Job profiles, Training Programs and Matching of these three categories. The focal point of this platform lies in the Matching section, where, after choosing the sector, trends, job profiles affected and the skills that have upskilling needs, the tool will recommend training programs suitable to improve and supply those needs.
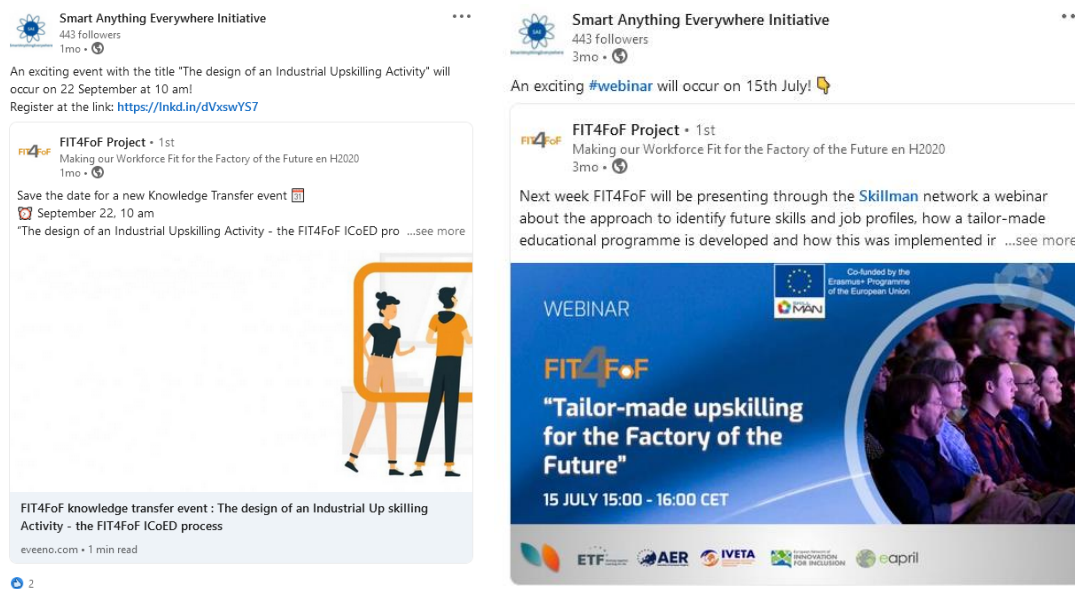

Figure 2 Dissemination of FiT4FoF

3.3   Connected Factories 2

Steinbeis and Politecnico di Milano have also create a link with the Connected Factories 2 project. The Connected Factories 2 project aims to provide guidance, knowledge, analysis, cross-cutting concerns, look for legal or technological solutions, and provide research on state-of-the-art cases to establish a common understanding, promote new directions and cooperation between systems and processes through digital technologies and platforms. Specifically, one stream of work has been focused on human factors, skills and other cross-cutting, non-technological factors that may enable or hinder the transition toward digital and circular manufacturing.

3.4 EIT Manufacturing

Made by Europe – https://eitmanufacturing.eu/ was launched in December 2018. It brings together 60 leading partners from business, education, research as well as 17 countries (e.g., University of Patras, Volvo, Tecnalia, CEA, Siemens, Whirlpool Europe, Festo, the Slovak University of Technology, EPFL, Technical University of Vienna, etc.). Its aim is to establish an innovation community and build a network of ecosystems where people will acquire skills and innovators will be able to attract investors.

Figure 3 EIT Manufacturing Partners

EIT Manufacturing has proposed four initial "flagship" topics, which are well aligned to SAE, namely:
1) Flexible Production Systems for Competitive Manufacturing
2) Low Environmental Footprint Systems & Circular Economy for Green Manufacturing
3) Digital & Collaborative Solutions for Innovative Manufacturing Ecosystems
4) Human-machine Co-working for Socially Sustainable Manufacturing

Politecnico di Milano is one of the leading partners of EIT Manufacturing and has created a bridge between SAE, the EIT Education and Innovation pillars, the co-location centre in Milan and the KIC activities. The Foundation and POLIMI have already started to engage with the EIT manufacturing's innovation and education activities, and will keep doing so in future (e.g., by participating in future EIT manufacturing's calls), with the aim of creating synergies to further enhance SAE assets, results and impacts, and provide EIT Manufacturing with access to a wider network of potential users and DIHs.

In this regard, Klaus Beetz, CEO of EIT Manufacturing, and Gian Mario Maggio, Director of the co-location South, attended the Ecosystem Building Event organized by Fondazione Politecnico di Milano on the 21st of October 2021 within the framework of the World Manufacturing Week and Forum 2021.

4 Future skills and training in Horizon and Digital Europe

4.1 Workforce skills for industry 5.0 (RIA)

Steinbeis and Politecnico di Milano participated in a proposal addressing the HORIZON-CL4-2021-HUMAN-01-26 call which aims to contribute to assessing the nature of job transformations in the context of Industry 5.0, estimating and mapping emerging occupations, providing guidance and recommendations for new learning and training systems, for policy-makers, businesses, individuals, to reduce the skills' gaps and foster industrial competitiveness.

4.2 Piloting a new industry-academia knowledge exchange focussing on companies' needs (CSA)

Politecnico di Milano, together with other partners from SAE ecosystem, participated in a proposal addressing the HORIZON-CL4-2021-HUMAN-01-20 call, which aims to promote industry-academia knowledge exchange focussing on companies' research and innovation needs, complementing university-business collaboration in line with the European Skills Agenda for sustainable competitiveness, social fairness and resilience. The knowledge developed in Smart4Europe2 and connections with the network of SAE DIHs, SMEs, RTOs and universities in the SAE ecosystem will be exploited in this respect.

5 Conclusions

In the context of Smart4Europe2's work package 5, the present deliverable focuses on skills and training. In addition to the many activities performed in the first year, there has been a continued drive towards providing training. In summary, this document reported about activities and results of task 5.5 during the second period of the project, namely:

- the ongoing organization, collection and dissemination of trainings by Smart4Europe2, SAE Innovation Actions and other sister projects (e.g., I4MS);

- the collaboration on future skills and education/training-related topics created between Smart4Europe2 and relevant actors in the European arena (METIS Erasmus+ blueprint, Fit4FoF, EIT, etc);

- the exploitation of assets and SAE community created thanks to Smart4Europe2 in new proposals addressing skill anticipation and development challenges in the new EU funding programmes.