Project Title:

THE FOF-DESIGNER:

DIGITAL DESIGN SKILLS FOR FACTORIES OF THE FUTURE

Project Acronym:

DigiFoF

Grant Agreement number:

2018-2553 / 001-001

Project Nr. 601089-EPP-1-2018-1-RO-EPPKA2-KA

Subject:

D.4.3. Report on professional trainings[1]

Dissemination Level: Public

Lead Organisation:

CONTI

Project Coordinator:

ULBS

Contributors:

All Partners

Reviewers: IDPC

Revision	Preparation date	Period covered	Project start date	Project duration
V1	December 2019	Month 12-24	01/01/2019	36 Months

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[1] "Any communication or publication related to the action, made by the beneficiaries jointly or individually in any form and using any means, shall indicate that it reflects only the author's view and that the Agency and the Commission are not responsible for any use that may be made of the information it contains."

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One of the main objectives of the project is to develop and support training programs to support industry professionals in acquiring skills, abilities and certifications for FoF design (digitization, automation, etc.), in order to create added value for both trainees and for enterprises.

These trainings resulted from the collaboration between academia and the partners from the industry and sought to provide the skills needed to transform into FOF/to further develop FoF elements.

The provided vocational training were aligned with the needs of industries dealing with FoF. Also, vocational and initial training programs/curricula used a problem-based learning approach; Also, it was important to develop and test a vocational training program, for employees working in the manufacturing sector, that dealt with aspects relevant to the FoF.

Vocational training helped business partners to move forward and increase their productivity. The training was prepared based on the current needs of the business partners. During the training period, employees had practically experienced appropriate ideas by developing and implementing them in the training laboratory to improve their work skills.

The students and the professionals had worked in small groups to solve open-ended questions found in the teaching materials during the vocational trainings or in the NEMO 2019 summer school. Tutors facilitated learning by supporting them, guiding, and monitoring the learning process. While working in a team, the trainees managed to enhance their critical appraisal, their skills for knowledge retrieval and their team-working skills

All the training programs are available to the public. Further on, all the materials – used for the trainings, are (or will continue to be) uploaded on the https://digifof.eu platform.

Most of the training programs took place in the OMiLAB laboratory sessions , developed as a digital training ecosystem.

This ecosystem became a community of Open Models Laboratory (OMiLAB) - an operational modular artefact that can be deployed as an installation in support of research and education on Digital Twins and digital transformation. There are three pillars on the basis of the ecosystem – each of them being both a workspace configuration and a resource package provided to environment adopters:

- **Co-creation** – currently instantiated in a Digital Design Thinking (sub)environment that supports the digitalization of "innovation boards" emerging in facilitation workshops with stakeholders from heterogeneous backgrounds.
- **Digital Twin** – currently instantiated in a Conceptual Modelling (sub)environment having at its core the BEE-UP modelling tool, which (a) integrates and extends a number of established languages: UML, BPMN, EPC, ER, Petri Nets, DMN, Flowcharts and (b) provides model interoperability (via HTTP requests or RDF model-to-semantic graph conversion); this sub environment also acts as the control panel for experimentation and fully integrated projects;

- **Agile Engineering** – currently instantiated in a Digital Engineering (sub)environment that enables: (a) the further customization of the BEE-UP modelling tool with additional abstraction layers; (b) the further development of interoperability adaptors (to IoT devices and external services); (c) the development of Cyber-physical demonstrators on two types of provided devices – Raspberry Pi-based and Robotic OS-based.

In this sense, in addition to Austria's main OMiLAB laboratory, five more national laboratories were created during the project, that act as national nodes in the network. Each of these educational nodes provides training to improve various FoF-related skills.

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2.1 Training # 1 at ULBS – June.2020

Author:	**Valentin Fleacă**
Event Title:	**Workplace safety – Employees emotion recognition** monitor a machine operator and detect the operator's emotional state. Send an alert if the operator is distracted or angry
Event Date and Venue:	**June 15 – 26, 2020, Sibiu, Romania**
Type of event (training, webinar, summer school):	**Vocational Training**
Organiser(s):	**Lucian Blaga University of Sibiu, Romania**
Link to Agenda:	**Link-ul de meet şi classroom**

Short description: Workplace safety – Employees emotion recognition: monitor a machine operator and detect his emotional state. Send an alert if the operator is distracted or angry. Is structured in 4 sections:

1. Introduction to Python & OpenCV:

- Presenting the objectives and structure of this laboratory
- Downloading and installing PyCharm & Python
- Installing OpenCV, NumPy, SciPy; OpenCV usage
- Python vs C++ vs Java; Python language exercises

2. Face detection

- Face detection: theory
- Detecting faces in images and in video sequences
- Project architecture setup

3. Supervised learning: Understanding classification algorithms

• Machine learning: classification problems • SciKit-learn discussions • Classification exercises **4. Recognizing facial emotions** • Understanding facial expressions and emotions • Recognize human emotions from live video sequences • Learning a classifier to recognize facial emotions from a dataset • Tuning the classifier parameters to increase accuracy • Live face emotion recognition system

Total number of participants invited:	**7**
Total number of participants:	**7**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/index.php/apps/files?dir=/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/ULBS/ULBS_01%3A%20Workplace%20safety%20%E2%80%93%20Employees%20emotion%20recognition)

ATTENDEES:

	Name	**Organisation**	**Signature**
1	Dinuţ Carmen-Maria	Continental Automotive Sibiu, intern	
2	Cheroiu Andrei Ionuţ	Continental Automotive Sibiu, VT EC E EN EP SPN department	
3	Pîrvan Victor Marius	Continental Automotive Sibiu, TPM CCN department	
4	Căpăţînă Luana-Maria	Continental Automotive Sibiu, Process CM department	
5	Ionescu Paula	Continental Automotive Sibiu, VNI CE SYS department	
6	Urian Adrian Mircea	Continental Automotive Sibiu, Safety and Security SW ECC department	
7	Mihuțoiu Cristian	Continental Automotive Sibiu, TCMO department	

	Most satisfied	Satisfied	Moderately satisfied	Rather dissatisfied	Not at all satisfied
By the topic(s) of the training?					
By the format of the training?					
By the duration of the training?					
By the teaching method of the training?					
By the equipment resources used and available?					
By the relevance of the subject matter(s) and industrial knowledge brought by the teacher regarding Industry 4.0?					

2.2 Training # 2 at ULBS – July.2020

Author:	**Valentin Fleacă**
Event Title:	**Workplace safety – Employees emotion recognition** monitor a machine operator and detect the operator's emotional state. Send an alert if the operator is distracted or angry
Event Date and Venue:	**July 13 – 27, 2020, Sibiu, Romania**
Type of event (training, webinar, summer school):	**Vocational Training**
Organiser(s):	**Lucian Blaga University of Sibiu, Romania**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/index.php/apps/files?dir=/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/ULBS/ULBS_01%3A%20Workplace%20safety%20%E2%80%93%20Employees%20emotion%20recognition)

ATTENDEES:

	Name	Organisation	Signature
1	Adamoiu Ioan Florin	A AM MI SW (CEP MT)	

2	Badiu Bogdan Vasile		
3	Bratu Mioara Raveca	VNI CE	
4	Butoi Emanuel		
5	Cojocaru Gabriel		
6	Dancu Sebastian Ionut	AMS BU VED & PSS	
7	Dontu Constantin		
8	Dorca Emanuel		
9	Eftimie Elena Dorina		
10	Ghise Andreea	VNI CE	
11	Lie Alexandru Stefan	VED EBS in echipa de SIL	
12	Linte Floare Irina	VNI CE	
13	Mihalcioiu Vasile Ionut	VED EBS in echipa de S&S	
14	Milea Marina	A HEAT LM SIB VNI SYS EU1 SIB 2 2	
15	Popa Ioan Alexandru		
16	Popescu Daniel	CONTI	
17	Savu Patru Adrian	CCN	
18	Stanciu Alexandra Ioana	A HEAT LM SIB VNI SYS EU1 SIB GD3	
19	Suteu Roxana	VED EBS SIL testing team	
20	Totoroga Elena	CCN	
21	Vacaru Rebeca		

2.3 Training # 3 at Conti – October.2020

Authors:	**Cristian Mihuțoiu**
Event Title:	**Cobots** - installing and programming information needed for a rapid implementation of Cobots in industrial environment
Event Date and Venue:	**October the 21st, 2020, Sibiu, Romania**

Type of event (training, webinar, summer school):	**Vocational Training**
Type of training (academic/industrial):	**Continental Automotive Systems Sibiu, Romania**
Organiser(s):	**Cristian Mihuțoiu**
Link to Agenda:	

Short description:

Cobots - installing and programming information needed for a rapid implementation of Cobots in industrial environment. Is structured in 7 sections:

1. **General presentation**: understand what cobot is and which are the ways of collaboration with humans;
2. **Cobot selection**: select the proper cobot for the application desired;
3. **Mechanical installation:** Understand requirements for cobot installation on production lines;
4. **Griper development**: griper concept and requirements;
5. **Electrical Installation**: electrical connections requirements;
6. **Software of cobot**: Understand cobot software possibilities;

Design of Cobot program: Program simple movement of a cobot: free movement, linear movement and process movement.

Total number of participants invited:	**10**
Total number of participants:	**10**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/remote.php/webdav/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/CONTI/CONTI_01%3A%20Cobots%20-%20Rapid%20implementation%20of%20Cobots%20in%20industrial%20environment/CONTI_01%20-%20Cobots%20-%20Rapid%20implementation%20of%20Cobots%20in%20industrial%20environment.pdf)

ATTENDEES:

	Name	Organisation	Signature
1	Giurgiu Dionisie-Paul	Conti Sibiu, VED ESS	
2	Șerb Răzvan-Ioan	Conti Sibiu, VNI CE	
3	Raulea Cristina-Maria	Conti Sibiu, VNI CE	
4	Draghici Roxana-Maria	Conti Sibiu, VNI CE	
5	Săvoiu Ioan	Conti Sibiu, FF CCN	
6	Buga Iulia	Conti Sibiu, ADAS	
7	Ciorgovean-Dragan Ezechiel	Conti Sibiu, ADAS	

8	Florea Adriana-Petronela	Conti Sibiu, QL	
9	Urian Adrian Mircea	Conti Sibiu, VED	
10	Boncea Șerban-Andrei	Conti Sibiu, IE CBS	

	Not satisfied	Rather not satisfied	Neutral	Rather satisfied	Really satisfied
By the topic(s) of the training?	0%	0%	20%	10%	70%
By the format of the training?	0%	0%	20%	40%	40%
By the duration of the training?	0%	0%	20%	30%	50%
By the teaching method of the training?	0%	0%	10%	20%	70%
By the equipment resources used and available?	0%	0%	30%	10%	60%
By the relevance of the subject matter(s) and industrial knowledge brought by the teacher regarding Industry 4.0?	0%	0%	10%	30%	60%

2.4 Training # 4 at UNIBG – December 2020

Authors:	**Fabiana Pirola, Giuditta Pezzotta**
Event Title:	**Business Process Management: Modeling and Simulation**
Event Date and Venue:	**16-17 December 2020**
Type of event (training, webinar, summer school):	**Online Training**
Type of training (academic/industrial):	**industrial**
Organiser(s):	**University of Bergamo, AFIL**
Link to Agenda:	
Short description: Vocational training on Business process analysis and re-engineering. The training aims at delivering process oriented competences to the participants to be able to describe and analyze a business process. Re-engineering competences will be also provided	
Total number of participants invited:	**17**
Total number of participants:	**17**

Link for training materials (in italian): https://cloud.digifof.ulbsibiu.ro/index.php/f/6021

(https://cloud.digifof.ulbsibiu.ro/index.php/apps/files?dir=/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/UNIBG/UNIBG_02_Business%20Process%20Modeling%20and%20Reengineering)

ATTENDEES:

	Name	Organisation	Attended
1	Giancarlo Andreoli	Serioplast	Yes
2	Valeria Annoni	Azienda Bergamasca Formazione	Yes
3	Andrea Avalli	Serioplast	Yes
4	Laura Balzari	Serioplast	Yes
5	Dario Belotti	Serioplast	Yes
6	Enrico Cagnoni	Exolvia	Yes
7	Ilaria Cairo	Servizi Confindustria Bergamo	Yes
8	Valentina Elvetti	Serioplast	Yes
9	Francesco Gallo	Itelyum Regeneration	Yes
10	Davide Gamba	MEI Srl & Università degli Studi di Bergamo	Yes
11	Benedetta Gnutti	Quantra	Yes
12	Giulia Imi	Serioplast	Yes
13	Chiara Lazzaroni	Quantra	Yes
14	Pietro Murari	Quantra	Yes
15	Simone Premarini	Serioplast	Yes
16	Marina Proietti Tranquilli	Serioplast	Yes
17	Irene Sardelliti	Kilometro Rosso	Yes

2.5 Training # 5 at at CIRIDD & CIMES – March.2020

Authors:	**CIRIDD, XX**
Event Title:	**Integration of the uses and design in the company business model**
Event Date and Venue:	**date-2020 morning – location**
Type of event (training, webinar, summer school):	**Training**
Type of training (academic/industrial):	**Industrial**
Organiser(s):	**Collaboration CIRIDD and CIMES**
Link to Agenda:	**/**
Short description: XXX.	

Total number of participants invited:	**?**
Total number of participants:	**?**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/remote.php/webdav/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/CIRIDD/CIRIDD_01-Integration%20of%20the%20uses%20and%20design%20in%20the%20company%20business%20model.pptx)

ATTENDEES:

	Name	Organisation	Attended
1	XXX	CIRIDD	Animator
2	XXX	CIRIDD	Animator
3	XXX	CIMES	Animator
4			Attendee
2			Attendee
3			Attendee
4			Attendee
5			Attendee
5			Attendee

2.6 Training # 6 at EMSE – July.2020

Authors:	**EMSE, Elaheh MALEKI**
Event Title:	**Formation OMILAB-Design Thinking pour enseignants**
Event Date and Venue:	**07-07-2020 morning – Mines Saint-Etienne**
Type of event (training, webinar, summer school):	**Training to use OMILAB as support for Design Thinking**
Type of training (academic/industrial):	**Academic**
Organiser(s):	**Mines Saint-Etienne** **FAYOL Institute, OMiLAB laboratory**
Link to Agenda:	
Short description: 4 hours training session for teachers, to transfer the key competencies for the use of OMILAB as industrial or student teaching support.	
Total number of participants invited:	**5**
Total number of participants:	**4**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/index.php/apps/files?dir=/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/EMSE/EMSE_07%3A%20Design%20Thinking%20for%20Product-Service%20System%20Design)

ATTENDEES:

	Name	Organisation	Attended
1	Elaheh Maleki	Mines Saint-Etienne	Animator
2	Alicja tardy	Mines Saint-Etienne	YES
3	Michelle Mongo	Mines Saint-Etienne	YES
4	Abir Fekih	Mines Saint-Etienne	YES
5	Jalila Elbousserghini	Mines Saint-Etienne	YES

2.7 Training # 7 at EMSE – July.2020

Authors:	**EMSE, Elaheh MALEKI**
Event Title:	**Formation OMILAB-Design Thinking pour enseignants**
Event Date and Venue:	**07-07-2020 afternoon – Mines Saint-Etienne**
Type of event (training, webinar, summer school):	**Training to use OMILAB as support for Design Thinking**
Type of training (academic/industrial):	**Academic**
Organiser(s):	**Mines Saint-Etienne** **FAYOL Institute, OMiLAB laboratory**
Link to Agenda:	
Short description: 4 hours training session for teachers, to transfer the key competencies for the use of OMILAB as industrial or student teaching support.	
Total number of participants invited:	**4**
Total number of participants:	**5**

Link for training materials:

to be inserted / should BE THE LINK TO Training material EMSE_07 (on digiFoF Website)

ATTENDEES:

	Name	Organisation	Attended
1	Elaheh Maleki	Mines Saint-Etienne	Animator
2	Nadine Dubruc	Mines Saint-Etienne	YES
3	Sophie Peillon	Mines Saint-Etienne	YES
4	Xavier Boucher	Mines Saint-Etienne	YES
5	Hervé Vaillant	Mines Saint-Etienne	YES

2.8 Training # 8 at EMSE – June.2019

Authors:	**EMSE, Nadine Dubruc, Sophie Peillon**
Event Title:	**Training "creativity for the design of integrated product-service offers" (Solystic Company)**
Event Date and Venue:	**21/06/2019 – Solystic, Valence**
Type of event (training, webinar, summer school):	**Creativity Training**
Type of training (academic/industrial):	**Industrial**
Organiser(s):	**Mines Saint-Etienne** **FAYOL Institute, OMiLAB laboratory**
Link to Agenda:	
Short description: Full day seminar to learn industrial actors to build integrated product-service offers and anticipate the organization impacts of such offers	
Total number of participants invited:	**8**
Total number of participants:	**12**

Link for training materials:

(https://cloud.digifof.ulbsibiu.ro/index.php/apps/files?dir=/DigiFoF%20Project/WP3_FoF_Designer%3AInnovative_Teaching_Methods_Tools/T3.2%20-%20Teaching%20and%20training%20materials%20for%20the%20design/EMSE/EMSE_07%3A%20Design%20Thinking%20for%20Product-Service%20System%20Design)

ATTENDEES:

	Name	Organisation	Attended
1	Nadine Dubruc	Mines Saint-Etienne	animator
2	Sophie Peillon	Mines Saint-Etienne	animator
3	Benjamin Serra	Mines Saint-Etienne	animator
4	Elahé Malecki	Mines Saint-Etienne	animator
5	R. Blache (matin)	**Solystic**	attendee
6	M. Bortolussi/	**Solystic**	attendee
7	E. Daymier	**Solystic**	attendee
8	F. Girodet	**Solystic**	attendee
9	C. Lhomme	**Solystic**	attendee
10	F. Madar	**Solystic**	attendee
11	D. Tresse (après-midi)	**Solystic**	attendee
12	P. Vuillaume	**Solystic**	attendee

2.9 Training # 9 at EMSE – Dec.2019

Authors:	**EMSE, Nadine Dubruc**
Event Title:	**Training on Factory of the Future challenges and Opportunities**
Event Date and Venue:	**05/12/2019 – Mines Saint-Etienne**
Type of event (training, webinar, summer school):	**Training**
Type of training (academic/industrial):	**Industrial**
Organiser(s):	**Mines Saint-Etienne** **FAYOL Institute, OMiLAB laboratory**
Link to Agenda:	
Short description: Discovering the industry of future by visiting IT'm factory. This is a visit by Clextral.	
Total number of participants invited:	**5**
Total number of participants:	**4**

Link for training materials:

https://itm-factory.fr/

ATTENDEES:

	Name	Organisation	Attended
1	Nadine Dubruc	Mines Saint-Etienne	animator
2	Audrey Cerqueus	Mines saint-Etienne	animator
3	Sophie Peillon	Mines saint-Etienne	animator
5	Charlotte Berthet	Clextral	attendee
6	Gérard Mounier	Clextral	attendee
7	Gilles Guerrin	Clextral	attendee
8	Dara Singharaj	Clextral	attendee

2.10 Training # 10 at EMSE – June.2020

Authors:	**EMSE, Nadine Dubruc, Sophie Peillon, Xavier Boucher**
Event Title:	**Training "Develop a service oriented strategy for an industrial company"**
Event Date and Venue:	**30-06-2020 – Andrézieux Bouthéon / Western Hôtel**
Type of event (training, webinar, summer school):	**Strategy oriented Training**
Type of training (academic/industrial):	**Industrial**
Organiser(s):	**Mines Saint-Etienne** **FAYOL Institute, OMiLAB laboratory**

Link to Agenda:	
Short description: Full day seminar to guide industrial decision-makers on (i) understanding key factors for the definition of a service-oriented strategy and (ii) defining a strategic roadmap adapted to their specific industrial context.	
Total number of participants invited:	**10**
Total number of participants:	**9**

Link for training materials:

to be inserted / should BE THE LINK TO Training material EMSE_06 (on digiFoF Website)

ATTENDEES:

	Name	Organisation	Attended
1	Nadine Dubruc	Mines Saint-Etienne	animator
2	Sophie Peillon	Mines Saint-Etienne	animator
3	Xavier Boucher	Mines Saint-Etienne	animator
5	M. Brougière	**Clextral**	attendee
6	C. Bugnazet	**Clextral**	attendee
7	E. Colleter	**Clextral**	attendee
8	J. Deygat	**Clextral**	attendee
9	M. Girodet	**Clextral**	attendee
10	G. Maller	**Clextral**	attendee
11	F. Serra,	**Clextral**	attendee
12	E. Perroton,	**Clextral**	attendee
13	T. Ramousse	**Clextral**	attendee