

PILOT ACTION EVALUATION

DT253 - PP6 - Joint evaluation report

Version 1
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1. The aim of the Pilot Actions

The purpose of the Pilot Actions was shared among all project partners: spreading knowledge about digital fabrication, fablabs and its possibilities, and secondly - reach the local (regional) community and build the community around the fablab.

Within the project and Pilot Actions implementation we wanted to boost technological development in our regions and create an ecosystem of innovation which center part will be our FabLabs.

The aim of the Pilot Actions was also to bring relevant stakeholders from the region together and to introduce FabLab to the wider audience - that is why we have chosen different types of activities and different target groups in each of Pilots: Community, Business, Education.

By Pilot Action 1 - Community with the open calls we tried to reach wider audience. The Pilot Action 2 - Business was supposed to show rapid prototyping and other fablab possibilities to entrepreneurs and startups. Moreover, we wanted to allow them to promote themselves on transnational events. With the Pilot Action 3 - Education we wanted to bring the most creative units from the academia environment to our fablabs.

2. Descriptions of activities that were implemented within the Pilot Actions provided by each PP

I. LP - MUSE

Pilot Action Community

Activities:

- Digital Transformation Camp: training and research laboratory born from the collaboration between MUSE and 4 companies from the region
- 20 talents chosen in a nationwide open call (from 60 submissions)
- one week camp with the support of mentors - comprehensive approach - business models, product design, coaching, storytelling, group work, prototyping using the FabLab equipment.

Outcomes:

- Prototypes of products and brand development of the company worked out during the camp
- various types of mentoring programs, each provided by different professionals from every field: Innovation brief, Product design & concept, Project Development, Business design.



Pilot Action Business - FabLab 2 Industry

Activities:

- Coaching program for startups - international mentors
- participants selected in the national call for makers: from 19 applications, 11 were chosen and divided into 5 teams
- comprehensive coaching program divided into 4 modules: (1) Users centered design & validation; (2) Business model; (3) Lean manufacturing; (4) (Re) design to manufacturing.

Outcomes:

- New skills gained by the participants: users centered design theory, tools to understand the keys to business development, organization of production process, tools for the analysis of the prototype useful to redesign the product
- participants of the pilot action courses took part in the FabBusiness events organised in Budapest and Bratislava and also in Tech Fest in Munich.

Pilot Action Education

Activities:

- Makers meet Artisans - combination of two communities very active in the area of Trento
- participants selected through the local call: 4 artisans and 6 makers were chosen from 21 applications
- the concept: ideas to be developed, proposed by the selected craftsmen, have been combined with makers useful skills for the development of the first prototype
- FabLab MUSE as a facilitator between two “worlds” - offering the opportunity to attend courses on 3D printing, laser cutting, electronic programming, facilitating the development of the prototypes.

Outcomes:

- Creating new ties between the geek community and the business world of artisans
- introducing makers to the companies
- giving basic knowledge about digital manufacturing to artisans.



II. PP2 - INNOC

Pilot Action Education

Activities:

- All Female Makers Bootcamp: 7 days of introduction into digital fabrication only for women
- two days of intensive course that illustrates the basic principles of digital fabrication - introducing software for creating 2D and 3D models and showing how to operate 3D printer, laser cutter, CNC milling machine and cutting plotter
- conceptualisation of the project - 4 days of free project work time - each participant had a full, 24h access to fablab and its equipment with the presence of mentors ready to help
- presentation of the project idea as a final of the bootcamp.

Outcomes:

- Ideas converted to products and prototypes
- new skills gained by the participants - being more independent in developing their products in the future.



III. PP3 - FabLab Budapest

Pilot Action Business:

Activities:

- Mentoring and training of business development and entrepreneurship within the FabLab and the FabLab users as well by providing a supportive business environment to assist entrepreneurs to grow and develop small companies
- providing access to facilities and resources and collaborating on events and initiatives with other business incubators
- a diverse business support offering, including business planning and strategy, IP protection and exploitation, financial management, marketing and market entry strategies
- individual coaching and mentoring programs, infrastructure of fablab, experts, international network, exhibition opportunity, media exposure.

Outcomes:

- Three projects with a developed manufacturing and business plan:
 - Platío - Solar Paving: an unconventional, primarily outdoor energy producing, modular paving system optionally equipped with information technological functions
 - Malinko - Sustainable bags and accessories: is to create products for you, that can be recycled; chemical-free materials, such as vegetable-tanned leather and 100% organic textiles, which do not harm the environment nor your health
 - Lacunae Design - 3D printed parametric jewelry.



IV. PP5 - FabLab Brno Pilot Action Community

Activities:

- Mentoring programme for university communities aiming to open the collaboration and widen the communities' knowledge about digital fabrication technologies available in local FabLab - StrojLab at Faculty of Mechanical Engineering Brno University of technology
- call addressed to students community, 9 participants chosen and divided into three teams were: (1) Formula Student Team - TU Brno Racing, (2) Pneumobil Racing Team Brno, (3) Aircraft Builders Team
- course held during the winter semester 2017/2018
- specific activities only for students
- 3 phases of the mentoring program: initial training, prototype design, product development.

Outcomes:

- Each group of students finally produced a prototype: (1) Moulds of sidepod for formula student monopost; (2) Steering wheel for Pneumobile; (3) Heat switch calibration components
- introducing university fablab to wider range of students
- participants gained new skills in designing and prototyping products.

Pilot Action Education:

Activities:

- Introducing strojLAB as an innovation platform for all students
- fablab supports non-frontal education approach on Institute of Machine and Industrial Design based on project learning system and is implemented directly into education program
- Fablab supports the implementation of student's semestral projects and diploma projects within the subjects: Team Project (FSI-ZKP), Mechanical Design Project (FSI-ZIP), Engineering Project (FSI-ZKR), Diploma Project II (M-KSI, M-PDS) (FSI-ZD5), Machine and Process Control (FSI-ZAE).

Outcomes:

- Implementation 'Learning by doing' and 'Do It Yourself' approach with the strojLAB infrastructure to the masters degree course at the university.



V. PP6 - FabLab Bielsko-Biała Pilot Action Community

Activities:

- Mobile pilot action: series of workshops regarding 3D modelling for children and youth from the community of the small municipality; total number of participants: 10
- 3D schools: Short presentations about 3D modelling and rapid prototyping in schools for children and youth between 13-18; total number of participants: 558
- online open call: Individual trainings, organised for the group of scouts that applied for the course; total number of participants: 14.

Outcomes:

- Almost 600 participants of the trainings gained basic knowledge about 3D modelling and rapid prototyping
- introducing the idea of fablab and its equipment to the local community
- two prototypes of improvements to the fablab equipment were produced: conical air filter for lens cooling system and pins for the laser cutter.

Pilot Action Education:

Activities:

- Trainings and workshops for students from the local technical university - on the base of MoU signed last year
- the aim of the pilot action was to improve the competences that students already have, so workshops were on more advanced level
- spatial modelling and reverse engineering course provided by an academic expert
- duration of the course: 30 hours
- number of participants: 15.

Outcomes:

- Bringing cutting edge technologies to the students
- improvement of the academic classes - most of the participants had already some classes regarding 3D modelling, however on a basic level - thanks to the pilot action they've learned more advanced skills
- 3D models, products and prototypes designed by the participants of the course.



VI. PP7 - Roglab Pilot Action Community

Activities:

- City for Everyone: public contest dedicated to the target group of professional designers or makers who already have a project concept
- Creathon: creative meet up; open call with no criteria - selection 'first come first served'; 36 participants, 6 mentors, 1 technician and 2 coordinators

Outcomes:

- Providing basic and advanced skills regarding 3D printing, 3D modelling and laser cutting to the community.

Pilot Action Education

Activities:

- Series of workshops in two primary schools in Ljubljana and surroundings
- schools were chosen on the base of the open call announced in schools in Slovenia; one of the criterias was that applicants (a teacher) had to present one or several ideas to be realized with the children with the help of RogLab's equipment; only 3 ideas were received and the best 2 were selected.
- 25 workshops provided by several mentors
- topic of the workshops: 2D and 3D modelling, how to use 3D printer and laser cutter
- trainings on how to use equipment and software also for the teachers at schools - close relationship between teachers and mentors from Roglab.

Outcomes:

- Basic skills about 3d modelling, 3D printing, vector drawing and laser cutting
- realisation of several real prototypes
- introduction to the possibilities that can offer their local fablab
- engaging a change of mind in the school professionals (teachers, head of schools, program deciders, etc.) concerning the possibilities of teaching new fabrication technologies in school.



VII. PP8 - FabLab Bratislava

Pilot Action Business

Activities:

- Mentoring in technologies in fablab accompanied with workshops with experts in bring innovations to market. Each workshop had different topic aiming at mentoring how to bringing the product to the market
- open call for applications
- the cycle of workshops - from 4th April till 5th May
- FabBusiness event in Bratislava - SOCIETAL AND ENVIRONMENTAL CHALLENGES IN THE FIELD OF INNOVATION AND TECHNOLOGY - aimed to create space for pitching ideas of mentees in front of broad audience, bring together different parts of the innovation ecosystem, discuss the most critical topics reflected in EU policies, exchange the best practices in different areas of business where fablabs can contribute and establish mutual contacts and partnerships across the region
- participants of pilot action business from Slovakia also took part in FabBusiness event in Budapest - 2-days long comprehensive training in presentation, aiming at improving their business pitches, by a remarkable expert with several years of experience in startup support services.

Outcomes:

- 7 prototypes: ParkBOT, Prototype of a brand new type of wind turbine, Wooden Keyboard, Social Media Counter, Smart IoT Weather Station, Control panel for rocket simulator, Compent
- gaining new skills of presenting ideas/prototypes to a broader audience
- establishing new contacts and partnerships across region and central Europe
- students were guided how to realized solution from idea, intention to project.

Pilot Action Education

Activities:

- One semester course at the university
- general information about digital production technology
- students were guided how to realize solution from idea, intention to project, project to prototype.
- in addition to theoretical knowledge, students gained practical skills: how to use the rapid production prototyping of FabLab, how to use CAD modeling software, a vinyl cutter, laser cutter, 3D printer, 3D scan and print, CNC cutter, Manufacture of printed circuit boards.

Outcomes:

- Intelligent documentation (model in common repository) and 3D solutions itself
- prototypes:



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- Smart sensors for Intelligent House
 - Security system for Houses - NFC Protect
 - automated entry of vehicles into a logistics center
 - YPASS-Facility access management system
 - GSM gate for opening the gate using your phone
 - Robotic Car
 - Car driver sleep detection during driving
 - Dirty hands multimedia system control
 - Intelligent Garden.



VIII. PP9 - FabLab Zagreb

Pilot Action Business

Activities:

- Mentoring program for startups and to-be-entrepreneurs
- participants selected in a national call - 9 applications - from which 3 teams, 3 members each were selected
- three stages of the course: mentoring program at partners, polishing business plans and pitch together on close events and final pitch at open event.

Outcomes:

- Documentation on how to develop ideas and products
- get familiar with design thinking process for projects in future, and user centered design
- knowledge and useful tools related to business development needed to understand the keys to development for the company, the basic skills to govern the start-up of a business and scaleup
- knowledge and skills for organizing manufacturing and scaleup production
- practical skills on digital fabrication tools, needed to understand whole process, and help them in future idea to product processes
- prototypes of the products: Makerphone, Robot Puppet Theatre, Vacuum forming machine.

Pilot Action Education

Activities:

- Provided with collaboration with two primary schools in Zagreb
- workshops for children - over 80 participants
- hands on experience with various digital tools which can be use to bring their ideas to tangible objects.

Outcomes:

- Portfolio of three different types of hands on workshops: (1) Make a Tie; (2) Mobile Pets; (3) Build LED Lamp
- bringing cutting-edge technologies to children and youth



IX. PP10 - MakerSpace Munich

Pilot Action Business

Activities:

- International coaching program “Fablab 2 Industry” supports great opportunities and help start-up ideas and prototypes develop into real ventures
- program offered three areas of expertise: (1) Business model; (2) Lean Manufacturing; (3) Product design
- participants were selected through the online national call - 9 applications were received, 6 teams were chosen
- workshops have lasted four month and took place in the Makerspace.

Outcomes:

- Participants have been able to use the knowledge of various mentors as well as the MakerSpace infrastructure
- tools to understand the keys to development for the company, the basic skills to govern the start-up of a business and its growth
- skills for organizing an efficient, effective and profitable production and development process.



3. The results of the Pilot Actions

Within the implementation of the pilot actions, the partnership has reached the goals that guided all the partners in planning such activities as part of the FabLabNet project itself. The most important aim was to spread the knowledge about digital fabrication and show places like fablabs and their possibilities to the wider audience.

Thanks to the activities provided within the pilot action community, we have showed the cutting edge technologies to the local society. Some of the partners chose to create a comprehensive workshops for to-be-entrepreneurs (LP), where, between others, they emphasised the role of rapid prototyping in making business. Other partners have chosen to introduce fablab and its possibilities to larger number of people and prepared a short presentations of 3D printing and spatial modeling for children and youth form the neighbourhood and beyond (PP6).

The results of the pilot action community were also prototypes created by the participants in each country - either understood as a real objects, or as a original mentoring programmes themselves.

Pilot Action Education in most of the cases was provided in collaboration with local universities of schools. The results were either complex half a year courses for academic students (PP4 & PP8) or shorter courses dedicated to spatial modelling and rapid prototyping (PP6). Also within the pilot action education some partners provided a series of workshops introducing 3D and 2D modelling to children from primary schools (PP7 & PP8).

The most important and common goal was to introduce fablabs to students and pupils and to show them that the equipment and mentors in fablabs can help them either in their learning skills or as a place to boost their creativeness.

On the base of evaluation surveys most of the participants of the actions were satisfied with the courses, workshops or trainings provided.

Pilot Action Business aim was to help young, creative people to change their ideas into the products and to introduce real prototypes to the market. It was done with the series of mentoring & coaching courses for to-be-entrepreneurs (PP9, PP10), hands-on workshops and big international events were the prototypes chosen by the jury were showed (PP3, PP5).



4. Transferability and transnational dimension

All of the activities provided with all three types of pilot actions are easily transferable to other regions. Each of the course and workshop can be repeated in the future in partners' institutions or transferred to others. The Pilots just need to be adjusted to the capacities of the institution that will provide it - in terms of human resources and equipment. For making this transferability easier, all the pilot documentation is shared online under Creative Commons rules.

The transnational dimension in direct way was provided within the pilot action business, when the participants from all countries that implemented it, took part in FabBusiness Events in Bratislava and Budapest. This gave them opportunity to learn from international experts and to show the results of their work - their prototypes - to international jury.

5. Summary and recommendations

Pilot actions were one of the biggest success of the FabLabNet project. We have reached all the relevant stakeholders of the ecosystem of innovation from each region. From children, young people and students, through academic and university environment, to startups, to-be-entrepreneurs and SMEs. All the activities were suppose to promote local and regional innovators and show them the possibilities of FabLabs, everything in line with the regional smart specialisation concept, Industry 4.0 and STEAM education assumptions.

Each partner, according to his capacities, introduced trainings, workshops and mentoring programmes to the groups that it considered the most relevant.

Hundreds of people have learned the possibilities that 3D printing, spatial modelling, laser cutting and many other DIY activities have in terms of boosting creativity, bringing innovation to the community and making business. Lots of so called hackathons and creathons organised by different partners brought solutions for companies or cities problems, new marketing ideas and prototypes of products.

Moreover, all the actions that have been taken can be repeated in the future very easily. We already have the knowledge that society wants these kind of activities - lots of the participants of the pilot actions have become active members of fablab communities.

Learning by Doing and Do It Yourself approaches in education and rapid prototyping in business are becoming more and more popular and this is also what we tried to promote with the FabLabNet Pilot actions.