Roll out Strategy

D.T3.3.2 PP9 FabLab.hr

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Table of contents

Table of Contents

1. Incorporation of innovative services and tools to your portfolio

1.1 Chapter 1 - Background

FabLab.hr, was established in 2013, as non for profit civils association with intention to promote digital fabrication. Since 2013, Fablab, as first and for the moment only official Fablab go in wider direction of promoting makers culture, also as a result of EU projects.

FabLab.hr, as fabrication laboratory, is a place where (almost) everything can be fabricated. Following Fab Charter, we support our members with tools and skills relevant to digital fabrication, but go further. At FabLab in Zagreb, there are 3D printers and 3D scanners, laser cutting and engraving machines, CNC machines and vinyl cutters, tools for electronics, programming, 3D modeling.

During the FabLabNet lifetime, FabLab.hr had a great opportunity to develop and polish tools for engaging community, develop new learning workshops, perform and promote the role of FabLab in stimulating the bottom up innovation.

1.2 Chapter 2 - Goal and expected outcomes

Innovation is in our core business. Therefore new services and tools are in the core of our existence.

Expected outcomes are related to growing business, on several segments, with related sustainable existence: education for innovation, circular economy, social innovation and science popularization including fusion of art and science as an essential part of innovation potential.

Contribution and role of a fablabs in creative industry as part of Industry 4.0 is essential mindset we got for our activities in future. Our way of educating, communicating and engaging new audiences with the use of digital technologies (adult-child couples, seniors, primary school children, university students, linking all educational levels) is in our daily business.

1.3 Chapter 3 - Target groups

FabLab will target the activities related to education transformation under title "Education (R)evolution, related to local community engagement with focus on people with special needs under title "Give-a-Hand", and related to entrepreneurial mindset shift under name "Do Local Go Global".

Education transformation is focused on the students group ranges from elementary schools and secondary schools, involved with dedicated activities planned and executed in conjunction with teachers and professors, to high school and university students, involved with the

contribution of their schools or faculties. The FabLab provides them a dedicated space where they can experiment and prototype, with all the needed tools and equipment for learning.

Local Community engagement is focused on local community representatives, City governments, to help them to mobilize individuals and communities relevant to grassroot innovations, to help them establish appropriate processes and spaces.

Entrepreneurial field is focused on individuals, startups, innovators, and other professionals with a wide variety of domains: architecture, design, engineering, electronics. They are involved with both the activities such as the Pilot actions or the remote areas, but also with the basic courses recurrent all year round.

As the New innovation Agent, our FabLab role is to promote innovation in education and academy, or better to say in the Education for Innovation. This includes not only education but also grassroot innovation in schools as part of the local community. This is related to the process of acceleration of innovation or idea to product or market.

1.4 Chapter 4 - Content of the action

We already implemented FabBox which is offered to schools and other education organization and local communities to rollout popup fablab idea.

FabFest is whole year activities: We already organized FabFest - The New technologies Open Day as a final day of STEAM Week event in November 2018. We follow this in City of Zadar, which open new collaboration.

Our intention is to make this activity annually. We already plan STAM Week in Zagreb in October 2019.

Since STEAM Week is closed with focus on educators, FabFest this October will be extended to first featured Makers Faire Zagreb, two day event, 12&13 October 2019 in inspiring venue of Technical Museum Nikola Tesla.

Similar to Zagreb, we are working to organize STEAM Week in Zadar in Spring 2020, but also with first Mini Maker Faire Zadar focused on general population.

Third level is related to Fab City activity. In summer 2018, City of Zagreb become part of Fab City Global Initiative. Implementation of this with City of Zagreb is undergoing. However, we are working with the City of Zadar to bring Zadar as second city in Croatia, but even more, whole Zadar county as Fab region to Fab City Global initiative.

One of the actions is related to specific Croatian situation. With around 1000 islands, with more than 65 populated, but also bad demographic trends we are working on network of creative spaces in Adriatic. The First Makers Archipelago in Zadar archipelago can be part of Fab City global initiative together with Zadar County, and similar projects with islands can be part of innovative actions.

1.5 Chapter 5 - Timeline

The planned actions will be planned in June 2019. Signed Cooperation agreement is expected to be signed with City of Zadar in June 2019. The first part of activities will be communicated to the public in mid-September 2019, and executed in March 2029. Evaluation of results will be subsequent, and completed by June 2020. Activities are related to Fab City, FabFest and FabBox level.

1.6 Chapter 6 - Budget

Economic sustainability is important but, of course, success is not made of economic balance alone. Together with local communities and other NGO with same mindset we are already applied, and we will continue to apply on both national calls, and international Including InterReg and Horizon 2020 funding. We believe in our strengths: we are able to invent new proposals that will allow our public to learn, be intrigued and have fun.

1.7 Chapter 7 - Assessment of the environment

Assessment in our content can be observed with basic SWOT analysis:

Strengths:
Human capacity as result of FabLabNet
Well established working group
Facility with easily accessible tools
Experience in planning similar activities
Reputation build as part of the FabLabNet and other EU projects.
High visibility on social media
Quick decisional processes.
Lot of Pop-Up FabLab activities

Weaknesses:
Working hours limitations, due to space limitations.
Low visibility on local newspapers and other traditional media
Uncertain financial background depending on active and constant project proposals

Opportunities:
Good reputation among stakeholders.
Political independent might be opportunity
Good potential in social, technological, cultural environment in Croatia.
Presence of many funding opportunities at local level and European level.
Good networking on international level

Threats:

Unprofessional competition.
Schools, libraries promoting similar courses.
Political changes

2. Earning official academic credit for Fablab education programs

2.1 Chapter 1- Background

FabLab.hr most important mission since 2013 was related to education. Close cooperation with Faculty of Architecture University of Zagreb, demonstrate opportunities not only to bring new digital tools to general population, but also to explore new ways of learning and knowledge transfer. Important role in this development are STEAM skills on one hand, and Design Thinking on other. STEAM vs. STEM is our daily mission since some of the members are with artistic background, and Design Thinking is in essence of design and architecture daily business.
Aware of this important, we force our self, and encourage Faculty of Architecture University of Zagreb to take more active and important role in education policy making in Croatia.
On other hand, potential, is not recognized, by educational system, skills developed in FabLab and similar environments are not certificated, practice work is not recognized. This collaboration was supported by general collaboration agreement, collaboration agreement related to Fab City action, and recent Fab Academy letter of intention to implement open Fab Academy node in Zagreb.

2.2 Chapter 2 - Vision and Goal

Our mission named **Education (R)evolution**, talks about our vision and ambition which is not only related to pure digital fabrication, but much wider role in education. We believe, our goal should be impact on all levels of education from kindergarten to primary schools, from secondary schools to high education. Furthermore, during last few years, we established and promote intergenerational education, by connecting but also practice, connecting university students to help us working with secondary students, secondary students to help working with primary pupils.
However, developing useful skills, skills for 21 century is great, but should be recognized and accepted. Therefore, simultaneously with developing skills, our goal is to work on their recognition in our educational system. This topic of recognition is subject of one InterReg Danube project proposal, but also national project proposal related to Fab Academy implementation in Zagreb, Croatia in cooperation between FabLab and Faculty of Architecture, but also with the support of the Ministry of Labor and Social Affairs, to be involved in recognition and certification process.
Therefor the goal is to investigate options for earning official academic credits for FabLab education programs and start dialogue with policy stakeholders on incorporating FabLab trainings into European Credit Transfer & Accumulation System (ECTS) and/or national equivalent.

2.3 Chapter 3 - Expected outcomes

First outcome expected is implementation of one respectable education process such us Fab Academy, which is recognized and accepted even by some high education institutions.

Second outcome is recognition of such education by Faculty of Architecture University of Zagreb bodies, but also national education system, as part of the certification process.

Third long term outcome, is related to implementation of independent education process (not related to Fab Academy) with symbiosis with ESOM activity to establish high quality digital fabrication and makers education on national level, but also in the region.

2.4 Chapter 4 - Target groups

Our activities related to digital fabrication and makers, but should be recognized and accepted. Therefore, simultaneously with developing skills, our goal is to work on their recognition in our educational system.

Who are potential users of our education and certification?

First, students and individuals who are interested in the digital fabrication and makers culture and who wants to extend their knowledge and skills.

Second, we would like to engage unemployment agency to provide funding for individuals who are interested to practice this education, and to find their position in future creative spaces around Croatia.

Third, corporations in the field of production and manufacturing might be interested to provide one or more individuals to such education process to help their organization to improve their manufacturing process in future with implementation of digital manufacturing.

Fourth, local communities who are more and more interested to open fablabs, makerspaces, creative spaces in their communities as part of support of grassroots innovations.

Whole implementation of this rollout strategy action will be in cooperation with Faculty of Architecture, but other university level organizations can be interested, such us Faculty of Mechanical Engineering, Faculty of Electrical Engineering and Computing, Faculty of Transportation and similar.

There might be interest from some secondary schools from technical field, and Industry Mechanical school or Secondary Mechanical school express interest to send some teachers for this education.

From corporation sector, there are several companies who are interested for such professional profile. One of the most recognized is Rimac Automobili, electric car manufacturing company, which is the producer of the fastest electric car in the world, Concept One. Beside Rimac Automobili, several companies might be interested from field of architecture, naval design, and industrial design.

So are following stakeholders were recognized, Ministry of Science and Education to implement STEAM Week and other aspects of non-institutional education, collaboration with primary and secondary schools, and universities, already mentioned collaboration with Ministry of Labor and with Unemployment Agency. In rollout activity, collaboration with Faculty of Architecture University of Zagreb cooperation on Fab Academy, but also with other higher education organizations. Last, we are working with some local governments, such as those in City of Zagreb and City of Zadar to more efficient rollout activity related to recognition of the skills gained in FabLabs.

2.5 Chapter 5 – Requirements for implementation of digital fabrication into credit system

The Agency for Science and Higher Education is central point for higher education recognition in Croatia. However, their role so fare was only recognition as part of formal education.
The Agency for Vocational Education and Training and Adult Education is relevant for nonformal and informal education and life learning education. There is a Methodology for development of VET occupational standards, qualifications and curricula which describe development of new education curricula and it is a starting point to prepare new program for implementation of digital fabrication into nonformal and informal credit gaining process.

2.6 Chapter 6 – Course content

According to plans the course will consist of several topics structured and related one to another to final project:
Introduction

- General Essentials
- Principles and Practices
- Project Management

Digital Fabrication

- Computer-Aided Design
- Computer-Controlled Cutting
- Electronics Production
- 3D Scanning and Printing
- Electronics Design
- Computer-Controlled Machining
- Embedded Programming
- Molding and Casting
- Input Devices

- Output Devices

Applications and Implications

Embedded Networking and Communications

Mechanical Design, Machine Design

Interface and Application Programming

Invention, Intellectual Property and Business Models

Project Development and Final Project Requirements

When finalized, beside rollout on national level for certification and recognition, intention is also to apply on EU ECTS credit system and bring course to EU course catalogue.

2.7 Chapter 7 - Financial resources

Sustainability is essential in such a long term process. Therefore, we are preparing project proposal related to Fab Academy and credit recognition process on national level as part of formal, nonformal and informal process. This project involve, Faculty of Architecture as leading partner in project proposal and FabLab as partner on this proposal. In case of this project, sustainability for three years will be defined.

Optionally, in direct contact with relevant Ministry and Agency, we would try to promote idea, and get funding in such process.

3. Strategies to target policy makers to spread Fablabs nation-wide

3.1 Chapter 1- Background

FabLab.hr position in ecosystem was always defined as content manager between Q-Helix stakeholders. Bringing together Education and Academia, Local communities and NGO, together with Business sector can be foreseen in our three mission.

Being first is great, however, being only official FabLab after several years of successful activities and EU projects is a bit frustrating. Therefore, one of the most important activity in last few years is to spread FabLabs across Croatia. Just to compare Italy or France got more then 150 FabLabs.

All our activities and three main missions are with purpose to demonstrate wide opportunity which FabLab can offer in community. It can be space for local community engagement, space where alternative education is implemented, or new business mindset is tested. In FabLab.hr we believe that our obligation is to demonstrate all aspects of those opportunities.

But the situation is slowly changing. Our popup activities in Croatia, show potential and we receive more and more interest from local communities and governments to help them in building their creative spaces such as fablabs or makerspaces.

3.2 Chapter 2 - Vision and Goal

We don't have ambition to open our offices across Croatia. We believe local strength and motivation should be the main resource to start. However, we are interested to share our knowledge to help this happen. We believe our role on nation-wide scale is to transfer knowledge and experience gained on EU projects (Horizon and InterReg), and scale them to national level. All this work should have an impact also on policy makers.

First goal is to establish national network, not just institutional, which we already made recently in form of FabLabHR.net, national fablab organization in Croatia, but to help establish local community oriented fablabs or makerspaces or other creative space which can work on common task, same interest locally productive and globally connected.

Our second goal is not focused on the national network, but since in City of Zagreb there is almost ¼ of total population of Croatia, efficient city network is also in focus of our activities. Third goal is related to remote areas, especially islands in the Adriatic sea, with depopulation trends, and we believe, creative spaces can slow, or even change those trends in future.

Our international relationship, help us, significantly not just to work on projects, but to build our capacity, and work on some ideas more efficiently. We have to mention here our potential

in international networking, with focus on European Fablab Charter and Vulca Mobility and Residency program.

3.3 Chapter 3 - Expected outcomes

Network of national fablabs is expected outcome, but this should not be only institutional organization, but the outcome should be feasible network of locally sustainable and nationally and internationally connected fablabs.

In following years, great outcome would be help and support establishing around 20 fablabs in Croatia, one in each county. This can help building network topology and spread national network much quicker.

Our intentions are not only national level. Since in the City of Zagreb, population is ¼ of total population in Croatia, our focus is also on city network of fablabs or makerspaces as idea factory organizations in local communities across the city.

Third outcome is related to Croatia. With around 1000 islands, with more than 65 populated, but also bad demographic trends we are working on network of creative spaces in Adriatic. We already collaborate with local communities in Zadar-Knin County, with the idea to establish The First Makers Archipelago in Zadar archipelago. Another effort is in the Split-Dalmatia County where we are collaborate with locals on the Biševo island, to establish The First Makers Island, locally productive self sufficient, globally connected island.

3.4 Chapter 4 - Target groups

Mainly we are working with local population, we inspire them, to start with makers idea. Those are pioneers and main force behind future network. We are connecting them with our international connections to be inspired even more in future.

Usually those local activities bring us in connection and collaboration with local governments or their representatives. Good practice is City of Zadar.

Third level is County level, which is necessary for sustainability. So fare we got promising collaboration with Zadar-Knin County, but with more activities in the future we can establish more such collaborations.

Fourth level is national level. We are working on national proposals to raise awareness of makers potential and grassroot innovations on national level.

We are looking forward to establishing more collaboration with Ministry of Regional Development, and connect local communities to similar international partners in future. Collaboration with Croatian Chamber of Commerce is essential in this segment as much as collaboration with the Ministry of Labor and the Unemployment Agency as well as with local governments (City of Zagreb, City of Zadar).

3.5 Chapter 5 - Requirements for implementation

Implementation of those activities is depending on our capacity. So fare, ideas and some human capacity is provided as part of FabLabNet project. In future, we expect some similar EU projects.

Main requirements for implementation is to raise awareness of different stakeholders to work more closely on identifying individuals and organizations who are interested to develop makers culture in their communities.

Following target groups we work both on national, but also with local governments, but also remote areas to rise this awareness.

3.7 Chapter 7 - Financial resources

Our resources are limited, to our sustainability. Financial resources for local fablabs should be subject of each local community and its local government. However, for national network, we will apply on national call to be funded for more years to help build such network in future.

We also expect some other national or EU calls to make some of mentioned activities funded in the near future.

4. Rollout Strategy Conclusion

This strategy represent our ideas how to contribute on national level but also regional and in European context to grassroot innovation. We are aware of huge potential, and our obligation is to spread this to all levels. FabLab.hr wish to rollout all skills and knowledge gained by working on EU projects. Pillars of sustainability, and social impact from Make-IT project funded by Horizon 2020, InterReg Central Europe FabLabNet, but also Horizon 2020 project DOIT, which is done by Faculty of Architecture and FabLab is an implementation partner. All three projects and many project proposal clear idea about our role in society our purpose and our missions.

This FabLab.hr Rollout Strategy will be under constant review to update our vision and meet our expectations in its implementation.