



MAKER

Action Plan (2022 - 2025) for Maker Movement Establishing in Bosnia and Herzegovina

The project “Maker Movement Establishing in Bosnia and Herzegovina and Strengthening in the Visegrad Region” is co-financed by the Governments of Czechia, Hungary, Poland and Slovakia through Visegrad Grants from International Visegrad Fund. The mission of the fund is to advance ideas for sustainable regional cooperation in Central Europe. The Project has been implemented by the Association FabLab Bosnia and Herzegovina in cooperation with partner organizations: Association Robisz.To (Poland), FabLab Budapest (Hungary), AGNICOLI (Slovakia), Make more (Czech Republic).



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1. Executive Summary

This Action Plan has been compiled under the aegis of the project “Maker Movement Establishing in Bosnia and Herzegovina and Strengthening in the Visegrad Region” (hereinafter: the Project).

The Action Plan contains:

- Specific goals and objectives for maker movement establishing in Bosnia and Herzegovina;
- Formal and nonformal educational activities specifically designed to achieve these goals, including professional development for school/university staff;
- Timeline for expected results;
- Recommendations for the financial support required to achieve the goals and objectives, and
- Indicators of progress for the plan implementation.

The Association FabLab (hereinafter: FabLab BiH) is responsible for implementing the Action Plan and will work collaboratively with relevant stakeholders in Bosnia and Herzegovina (hereinafter: BiH).

Annually, FabLab BiH will reconvene the Action Planning Team to review the Action Plan, determine its effectiveness toward meeting the stated goals and revise as necessary based upon updated performance data and other developed evaluative criteria.

2. General information

- **Project:** Maker Movement Establishing in Bosnia and Herzegovina and Strengthening in the Visegrad Region
- **Partner organisations:** Robisz.To Association (Poland), FabLab Budapest (Hungary), AGNICOLI (Slovakia), Make more (Czech Republic)
- **Country:** Bosnia and Herzegovina
- **Contact person:** Edin Skaljc, director
 - Email: edin@fablab.ba

3. Policy context

The action plan aims to impact the '**Development Strategy of the Federation of Bosnia and Herzegovina 2021-2027**' (predominantly focused on two priority axes: 'Accelerated Economic Growth' and 'Prosperous and Inclusive Social Development') and '**Strategy for the establishment of the maker movement in BiH**' which has been developed as a part of the Project.

Moreover, the action plan addresses the state-level working document '**Priorities in integrating entrepreneurial and digital competence into education systems in Bosnia and Herzegovina 2019–2030**' which aims to bring digital skills and competences (DSC) in line with the **European Digital Competence Framework** with a short-term goal of integrating DSC into International Standard Classification of Education (ISCED) levels 1, 2 and 3.

At the local level, most notably the action plan addresses the '**Youth Strategy of the Municipality of Novo Sarajevo for the period 2022-2026**'.

4. Action Plan background

Using the support from the project partner 'Make More', FabLab BiH has created the **Strategy for the establishment of the maker movement in BiH** (hereinafter: the Strategy). The Strategy aggregates important stakeholders in BiH that act as providers, enablers, supporters or potential users of maker environments across BiH.

The **Maker Movement** is a social movement with an artisan spirit. Promoting equity in the maker movement is fundamental to its success in democratizing access to STEAM and other tech-rich and art domains. Maker environment emphasizes learning-through-doing (active learning) in a social environment. It encourages novel applications of technologies, and the exploration of intersections between traditionally separate domains and ways of working including robotics, 3D printing, metal-working, and computer programming. Community interaction and knowledge sharing are often mediated through networked technologies, with websites and social media tools forming the basis of knowledge repositories and a central channel for information sharing and exchange of ideas and focused through social meetings in shared spaces such as FabLabs.

FabLab BiH acts as a hub that will provide different services to creative environments, such as access to equipment or mentors (personnel, experts) to its members and wider community. It will also be one of the means to represent ideas, positions, proposals and remarks towards the policy makers and governmental bodies, influencing policies and regulatory framework. Finally, it is also a mechanism to develop future actions related to the Maker Movement described above.

FabLab BiH is recognized by local managing bodies (Federal Ministry of Development, Entrepreneurship and Crafts, Ministry of Culture and Sports - Canton of Sarajevo, Ministry of Science, Higher Education and Youth of Sarajevo Canton), responsible for the promoting investment in education, technology transfer, social & eco- innovation, public service applications, networking, etc.

4.1. Basis

Youth unemployment is a long-term issue and a key concern in the wake of the coronavirus crisis in BiH. According to the International Labor Organization, the pandemic is having a "devastating and disproportionate" impact on youth employment, while the most recent figures show that young people face major obstacles in continuing training/education and entering the labor market. The **lack of entrepreneurial spirit** is combined with a **high percentage of unemployed people**. In 2020, the estimated youth unemployment rate was at 40.18% with high levels of long-term unemployment (57.5%).

In addition, youth unemployment continues to contribute to an **endemic brain drain** from the country and is the highest in the region. Innovation statistics on **intellectual property** ranks BiH on the bottom of the EPO list. The country is among the worst positioned countries in the region in terms of **education, R&D and innovation**, facing numerous development problems and challenges.

There is also a huge **mismatch between the skill supply and skill demand** on labor markets with a lack of equal access and awareness about the benefits that the creative and educational potential such as a maker movement delivers (community engagement, education, knowledge, enthusiasm and passion, shared technologies).

Maker Movement represents one of the possible mechanisms to overcome challenges and issues described above as well as to use the potential of young people for future development.

This initiative was co-designed by existing initiatives and maker environments in Visegrad Group countries.

Main challenges that the FabLab BiH will address with this action plan are:

- to foster adaptation of the maker movement in BiH
- to support education, local economies and self-employment
- to increase knowledge exchange and level of skills in the communities.

4.2. Knowledge applied from the project ‘Maker Movement Establishing in Bosnia and Herzegovina and Strengthening in the Visegrad Region’

Partner experience and practice	Contribution to the services developed in the Action Plan
<p>‘Establishing maker subject at university’ by FabLab Bratislava</p>	<p>Experts from FabLab Bratislava held an intensive training on 'Introduction of courses on Maker culture in universities' as part of the Project. Participants learned more about knowledge management (how to manage knowledge and how best to use it), effective problem solving using the so-called TRIZ methods of better understanding and solving complex managerial problems, but also the experience of FabLab Bratislava in introducing maker culture subjects into teaching processes in Slovakia where feedback from educational institutions is very good and promising, with the possibility of replication in other countries, including BiH. "The main goal of introducing subjects that would study maker culture is to help students discover their creativity." Jozef Vasko, head of FabLab Bratislava.</p>
<p>‘IT systems and Maker Movement’ by AGNICOLI Bratislava</p>	<p>The transition to digital production has become more popular with the increase in the number and quality of various IT systems as part of additive production. As more automated tools are used in production, it has become necessary to model, simulate and analyze all machines, tools and materials in order to optimize the production process itself. In order to learn as much detail as possible about the role of IT systems in makerspaces, participants underwent a training with IT experts on topics such as ‘Right Information - At the Right Time - With the Right Purpose’, ‘Shared Warehouse Documentation System’, ‘Metadata schemes in document management’, ‘Enterprise IT infrastructure’, case studies (TOGAF, Archimate, ITIL, ...), ‘Sparx Systems Enterprise Architect tool’, ‘ITSM tool’, LabVIEW, LabWindows, TestStand, etc.</p>
<p>‘Organizing a Maker Faire’ by Make More</p>	<p>The world's largest festival of invention, creativity, resourcefulness, and entrepreneurship - Maker Faire is a gathering of technology enthusiasts of all ages and skills, such as craftsmen, hobbyists, members of the scientific community, engineers, science clubs, artists, students and commercial exhibitors. The goal of Maker Faire is interactive education and entertainment, informing the public, presenting interesting projects, as well as</p>

	<p>connecting the maker community with academia and industry, and a unique opportunity to involve the public in practical experiments. Maker Faire was founded in 2006 in the San Francisco area as a project by the editors of Make: magazine. Since then, it has grown into a significant global network of both leading and independent events. Representatives of the Czech organization Make More, which has been systematically supporting the Maker movement in the Czech Republic for many years, held a training on the topic 'Organization of the Maker Faire Festival' for partner organizations. Given that FabLab BiH is in the process of strategic planning for the organization of the first Maker Faire in BiH, this training was extremely important for the quality preparation of the event.</p>
<p>'R&D and innovation' by FabLab Budapest</p>	<p>Digital transformation, primarily through research and innovation, has an impact on all sectors of the economy and society by changing the way we live, work and communicate. It is almost impossible to think of the possibility of being competitive without the so-called "Knowledge economies", i.e. investments in research and development as continuous innovations. Participants learned more about the role and impact of Maker culture on R&D and innovations, with a focus on the so-called "Open innovation". As we all face resource constraints today, the concept of frugal innovation is becoming very relevant for application, especially in the world of makers who most often base their solutions on this. The concept originated in emerging markets with the purpose of creating innovations with limited financial and technological resources. Minimal use of resources results not only in efficient saving of components and local raw materials, but also in the creation of simpler designs, i.e. products through different phases of its life cycle. Participants learned more about the RepRap project (abbreviation for Replicating Rapid Prototyper) as an initiative to develop a 3D printer that can print most of its own parts as well as Thingiverse - online platform for 3D design and 3D printing. In addition, the concept of DIDO: Data-In and Data-Out was presented, which as a future transformation should lead to a change in the PITO (Products In Trash Out) urban model.</p>

<p>'Maker education' & 'Attracting/Retaining volunteers'</p> <p>by Robisz.to</p>	<p>Models, goals and principles of maker education were presented at the training held by experts from Robisz.to where participants gained knowledge about different approaches to learning such as horizontal and team approach, 'Learn, make, share' as guiding ideas for all makerspaces, but also about logistics, costs, etc., when organizing educational events in maker culture. Maker education supports the growth of integrity and the formation of independence among students, as well as the promotion and development of interaction between them, regardless of previous knowledge and experience.</p> <p>What forms the backbone of any successful FabLab / makerspace are their volunteers who invest their time, skills, knowledge and motivation in their work. These skills range from technical, marketing, administrative and the like. to those needed to maintain order and cleanliness of the space. Willingness to help people or contribute to the work of FabLab / makerspace through their time and talents / knowledge is just as important as working on 3D design and equipment in space.</p>
<p>'Maker culture and intellectual property'</p> <p>by FabLab BiH</p>	<p>Maker culture is an important and inevitable manifestation of the future economic development of any country. It brings the market disruptions, but also unique opportunities for innovation, research and development. Along the way, many makers focus on starting their own business, building a team, attracting investors, making marketing plans, etc., while not paying enough attention to intellectual property issues. However, this is at the same time critical to ensure that makers take the necessary steps to protect their intellectual property by avoiding the potential risks of inadequate protection. Intellectual property is main driver of prosperity and local development.</p>

4.3. Work groups

Fablabs BiH Network is already being established, and, so far, all stakeholders across the country were not only contacted and informed, but also engaged. The FabLab has **more than 30 partners** so far, covering different fields of interest, from local communities, regional development agencies, universities and, most importantly, already running **makerspaces in BiH**.

Working groups within FabLab, as a maker movement initiator, were established. Their fields

of work include:

1. listing and describing available equipment and tools (including equipment of existing makerspaces and industry partners) to be shared among makers;
2. listing and describing available mentors, expertise and skills, to be reused within maker movement;
3. identifying possible and viable business models for maker environments as well as for their sustainability;
4. clarifying legal, IPR and other aspects related to the operation of makers.

FabLab BiH within Maker Movement will provide **following services to its members** as well to the wider public:

- Exchange and/or access to the available equipment and tools among makers.
- Exchange and/or access to mentors, expertise and skills among members.
- Promoting innovative and maker environments in BiH.
- Identifying alternative funding opportunities and common project applications (EU and national).

All above mentioned services will be performed on the virtual Maker.ba platform that is being implemented incrementally. The platform consists of a repository of makers with well described equipment and tools, their expertise and skills. All makers have a possibility to present themselves and their activity. Finally, the platform will support multimedia collaboration environment, where all the members will be able to access info on projects, conferences, webinars and other collaborative activities such as Maker Faires.

- Engaging and influencing policy makers.
- Identifying alternative funding opportunities and common project applications (EU and national).
- Cooperating with similar networks across Europe.

The FabLab will further **support connections between the industry, educational system and open minded, creative individuals** across the country.

The further funding is needed specially to optimize, systemize and professionalize its service in order for the maker network to become fully sustainable after 3 years of its operation.

Goals and activities of the Action Plan for the period 2022-2025

<i>Medium-term goal 1: Maker education as a part of formal educational system</i>					
Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>1.1. Training for lecturers with support materials</i>	Needs Assessment	FabLab	Survey done	Q1 2025	Public funding
	Educational institutions nominate their representatives	Educational institutions (high-schools and public universities)	Identified persons who will be participants of the training	Q2 2025	Public funding
	Development of training materials	FabLab	Learning outcomes identified Pilot test performed	After adoption of strategy at local/national level Q4 2024	Public funding
	Training implementation	FabLab	Training delivered	Q1 2025	Public funding
	Training evaluation	FabLab	Evaluate knowledge acquisition	Q4 2025	Public funding
<i>1.2. Popularization events</i>	School maker faire	High school and FabLab	Maker Faire plan developed, and Maker Faire organized	In May every year	Public funding/EU funding
	Pop-up FabLab	FabLab	Preparation plan and set up of the pop-up FabLab	In October every year	Public funding/EU funding
	Accredited university class	University and Agency for accreditation/ Ministry of education	Certification / Accreditation gained	First quarter of 2025	Public funding/EU funding

Medium-term goal 2: Maker education as a part of informal educational system

Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>2.1. Workshops & Training on maker culture</i>	Provide systemic support for the creation of open workshops and makerspaces	FabLab	# of newly makerspaces/fablabs established	Q4 Annually	Public funding / Private funding
	Maker training center establishment	FabLab	Training center for technical, and relevant soft skills established within FabLab	Q4 2022	Public funding/EU funding
	Creation of tutorial video material aimed at makers	FabLab and partners	# of video content created and published	Every quarter, starting from Q3 2022	Public funding / Own sources
<i>2.2. Professional clubs</i>	Networking with informal education organizations	FabLab	# of partnership agreements signed	Annually	Own sources
<i>2.3. Educational leisure institutions</i>	Summer city Camps implementation	FabLab and partners	# of summer city camps during the holidays organized where children can give a try to all important technologies and handle basic principles applicable to other spheres of life	Annually	Public funding/ Regional funding/ EU funding

Medium-term goal 3: Establishing external cooperation

Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>3.1. Network of possible external partners</i>	Maker Faire as a support for job creation	FabLab	Maker Faire organized and held in Sarajevo	May 2022	Private companies, public funding
	Collaboration with private sector and tech companies established	FabLab	# of partnership agreements for outsourcing innovation and prototyping activities signed	Q4 Annually	Own sources
	STEM promotion campaign	FabLab	Pop-up FabLab created and high-schools visited	Q4 2024	Public funding/EU funding
	Cooperation with traditional institutions (e.g. museums) established	FabLab	# of partnership agreements signed	Q4 Annually	Own sources

Medium-term goal 4: Communication of Maker Movement potential and activities

Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>4.1. Advocacy and marketing / PR campaign</i>	Launching web Platform for makers	FabLab and project partners	Maker.ba platform with general information as well as blogs and longer articles launched	February 2022	Visegrad Fund + Own resources
	Social media presence	FabLab and project partners	Social media for the Project and maker community launched	January 2022	Visegrad Fund
	Partnerships with influencers and companies	FabLab	# of partnerships and sponsorships agreements signed for Maker Faire	May 2022	Private companies
	Organizing a conference with stakeholders 'presence	FabLab and project partners	Maker conference held	March 2022 Annually	Visegrad Fund Own resources
	Presence in media as advocacy towards public representatives and companies	FabLab and project partners	Media partnerships and Media coverage of the conference	March 2022	Visegrad Fund

Medium-term goal 5: Early-stage support of the Maker movement

Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>5.1. Support network for makers</i>	Set-up the infrastructure for emerging makerspaces	FabLab and partners	Maker platform established	February 2022	Visegrad Fund + Own resources
	Developing a booklet	FabLab and stakeholders	A booklet with recommendations aimed at all the aspects of creating as well as running a makerspace is made	Q4 of 2022	Public funding
	Advocacy on the national level	FabLab and stakeholders	# of advocacy campaigns with the aim of incorporating makerspaces into relevant strategies on the national and local levels	Q1 2025	Public funding/EU funding
	E-shop / virtual job platform establishment	FabLab	E-shop and virtual job platforms from which makers could be hired or where they could place their ads are launched as a part of Maker.ba platform	2022	Own resources
	Supporting women in tech	FabLab and partners	# of women on leadership positions at FabLab and partner organizations included; # of organized open-time of FabLab dedicated to women; # of projects' focused on women participations	From 2022	Public, regional and EU funding

<i>Medium-term goal 6: Mapping and community building</i>					
Expected result	Activity	Responsibility	Indicator of progress in relation to the initial situation	Deadline	Source of financing
<i>6.1. Community events</i>	Maker definition within local context	FabLab & Stakeholders	Easily understandable and embraceable definition of 'maker' is made and communicated	June 2022	Own resources
	Community events	FabLab	# of Meet-the-makers events held	First Friday of September every year	Own resources
<i>6.2. Mapping the maker community</i>	Listing and cataloging makers and maker(space)-related projects	FabLab & Stakeholders	Maker.ba platform established	February 2022	Visegrad Fund

4.4. Viability and sustainability

The needs for operational delivery of the FabLab services to identified target groups of users (namely, already existing makers and the ones that are being setup) are imminent. Two services were identified as essential: **providing different kinds of support to new makers**, during the establishment process and **exchanging mentorship and expertise** among existing makers. This means that all the necessary steps to establish the maker movement will continue in parallel with establishment of the aforementioned services.

Funding by the Visegrad Fund which was already approved in 2021 supported essential steps to start provisioning of the services to the makers.

After the completion of the Project, the FabLab will start to apply for public funding together with its partners.

4.5. Impact expected

The impacts envisaged, relate to different stakeholders that include a wide target group of makers and businesses across the country. Most of the impacts will be a result of joint or connected operation of makers, enabled by the existence of FabLab and maker platform. Within the established maker movement, there are three impacts expected for the

individuals (makers), start-ups and SMEs. First, it is expected that the movement will emerge as the dominant source of livelihood for individuals as they find ways to start-up businesses around their creative activity. Second, it is expected that there will be **more collaboration among start-ups/SMEs** across a flexible ecosystem and will no longer require scale to be viable. Third, SMEs will increasingly **automate their operations** enabled by the technologies of production and access (to funding, design, resources, tools, and markets) and will seek greater local support. **Most of today's emergent makers will become innovative owners of SME, providing leadership examples to new generations of the makers.** The exchange of ideas, learning and skills, as well as capital, will lead to a boosted, self sustainable, **innovative ecosystem.**

One of the most important impacts for **BiH** is that the maker movement will **keep the region alive.** This will be possible by **keeping the young people in the region or returning to the region after completion of their studies or work abroad time.** In addition, it is expected that a healthy innovation ecosystem of maker movement, supported by FabLab will result in more **women** involved in maker activities, thus providing more **women in STEM.**

4.6. Monitoring activities

Monitoring activities will be embedded into the FabLab BiH management procedures. The FabLab will measure indicators (most important are described in the table above) on the quarterly basis. It is expected that the indicators will start showing results in the third year of the maker movement establishment. In addition, the real funding versus anticipated funding opportunities will be closely monitored and assessed.

FabLab will perform constant assessment and evaluation of the makers' satisfaction with the services provided. This will be performed via interviews or common meetings with makers. It is expected that since the makers themselves participate in the establishment of the movement as well as in the performance of the maker platform the level of satisfaction will be sufficient and possible actions to improve the services will be quickly identified and implemented.