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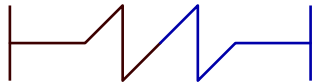


BIRMINGHAM CITY
University



URBAN MANUFACTURING

**COLLABORATIVE MAKER SPACES:
PIVOTING IN A PANDEMIC**



TEHNIČKI MUZEJ
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INTRODUCTION

The Urban M partnership wished to continue to collaborate and exchange experiences on how collaborative maker spaces have changed and adapted during the global pandemic, when many spaces have been closed or had limited access.

The aim of this document, is to share examples of the tools, techniques, projects, and methods used by the project partners to ensure makers and innovation communities continue to connect and develop in cities and regions following the period of unprecedented change, during and after the pandemic of 2020-2021.

The examples include an expansion to the reach of collaboration, courtesy of the different approaches to makerspaces and an opportunity to explore how different policy drivers affect particular innovations e.g. for some the need is an increase in digital innovation, for others, it is increased access and help to maker and craft communities.

BIRMINGHAM ADVANCED PROTOTYPING FACILITY

LOCATION

Aston University Campus, Birmingham, UK

ORGANISATION

Advanced Prototyping Facility APF, Aston University

FUNDING

The project is part-funded by the European Regional Development Fund programme and part-funded by Aston University, and as such is bound by State Aid and public funding rules, regulations and eligibility criteria, and is available to SMEs in the Greater Birmingham and Solihull region.

WEBSITES

www.aston-apf.uk/

www.aston-apf.uk/casestudies.htm

BACKGROUND AND CONTEXT TO GOOD PRACTICE

The Advanced Prototyping Facility project is provided by Aston University to assist businesses (SMEs), improve awareness of the opportunities available through additive manufacture (a new manufacturing method using 3D Printing) to improve the efficiency and effectiveness of existing designs and to develop new products all the way through to producing prototypes.

The project brings together 3D printing methods such as:

- VAT Polymerisation (SLA,DLP,CDLP)
- Material Extrusion (FDM,FFF,CFM)
- Binder Jetting (BJ)
- Material Jetting (MJ,NPJ,DOD)
- Powder Bed Fusion (MJF,SLS,DMLS,SLM,EBM)
- Direct Energy Deposition (LENS,EBAM)
- Sheet Lamination (LOM)

All of which allow for additive manufacture in a wide range of polymers, plastics, ceramics and metals.

All this combined with a team of experts and academics that can help improve designs and create designs for manufacturing.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

Covid did result in the project having a delayed start. It received funding in January 2021, the facility was opened in July 2021 and it was not until September 2021 that the full team was lined up (project end date June 2023) The project delivery started as the UK was emerging from

its lockdown restrictions (the final sectors of the economy were reopened in July 2021). So the project provided a solution to SMEs that were facing material shortages due to Covid and Brexit alongside a skills gap including;

- Lack of CAD and having to design from scratch
- Lack of 3D printing knowledge
- Lack of access to 3D printers
- Lack of understanding of materials requirements
- Understanding of costs
- Sometimes lack of business case
- Understanding of manufacturing techniques
- Guidance needed

The project provides support to all of the above and includes:

- Design help and support using Solidworks and other CAD packages
- Prototyping using additive manufacture and 3D Printers
- Design for manufacture support
- Testing of materials where required

The facilities on campus include 3D printing machines which can be operated remotely, having the advantage of being able to provide a service even if a lockdown prevented access to public facilities. A small, but highly skilled team works at APF, including a Design and Additive Manufacturing Engineer and an Additive Manufacturing Technician to support SMEs with the technical requirements. They are supported by a Senior Project Manager and Assistant Project Manager with industry experience.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

The demand for the services provided by the project has been extremely high, so much so

“ The impact on the maker community/ the businesses being supported has been significant. ”

that by March 2020 40 SMEs were engaged and were in the process or were waiting to use the collaborative maker space. The project has effectively delivered two thirds of its target of 62 by June 2023 in 8 months. APF assists Small and Medium Sized enterprises (SMEs) in a range of sectors including standard manufacturing, jewellery, aerospace, rail, automotive, agriculture, food and beverage and medical devices, but no sector is turned away.

The impact on the maker community/the businesses being supported has been significant. The service provided by APF is bespoke with their technicians working with the individual companies to solve problems. SMEs have a small number of staff who sometimes don't have the necessary skill set to efficiently prototype products. The missing skills include: design knowledge; cad skills, maker skills, additive manufacture, design for manufacture, industry practice, milling and machining, injection moulding and electronics.

APF has provided support with all of the above. This has included training staff on both the use and maintenance of machines such as FDM printers, signposting to other support within the ecosystem where this is more appropriate, providing software solutions and writing code to improve machines' interoperability, providing advice on what material is most suitable and providing access to 3D printing machinery to prototype products. The service has been a real boost, particularly to early stage SMEs as it has provided solutions to design and manufacture issues resulting in a more efficient process that saves time and reduces costs.

The project is embedded into the local ecosystem of makerspaces and also connects with Birmingham City University's STEAMhouse facility when other types of support are required.

DEPARTMENT OF INNOVATION AND DIGITAL SERVICES

LOCATION

Bratislava, Slovakia

ORGANISATION

The City of Bratislava

FUNDING

ERDF Operational Programme Research and Innovation, for Programming Period 2014 – 2020

During the second wave, the city was tasked with regular weekly Covid testing across the whole population of the city. Bratislava wanted to improve the experience, since testing was conducted during winter months, and started to work with a group of developers to create a simple reservation system and improved the online and real life experience on a weekly basis. This was for us a great example of creativity and collaboration for the greater good of residents.

BACKGROUND AND CONTEXT TO GOOD PRACTICE

Closer collaboration with business and the creative sector to address challenges the city is facing in the uncertain times. During the first wave of Covid, the City of Bratislava opened up to cooperation with external stakeholders to better address our challenges. To use an example, there was a citizen-driven activity called Who will help Slovakia (Kto pomoze Slovensku?). The city started to talk to them about the needs and challenges we are facing, from data collection, to equipment, protective gear or material support. These volunteers and companies wanted to match the needs of the city with their capabilities. For example, Fab Lab helped us with protective masks and shields that were printed on a 3D printer and assembled by them. They were used at senior care facilities as well as with the homeless. The city also got involved in various hackathons that were aiming at easing the crisis, sharing information and matchmaking providers.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

Out of sheer need. The city representatives didn't have all the answers and they needed help and out of the box thinking.

The open and transparent culture helped with opening up to innovative solutions. Willingness to try, experiment, fail and repeat were crucial in addressing the needs and problems we were facing.

“ This was for us a great example of creativity and collaboration for the greater good of residents. ”

Handy Tools

Thanks to innovation, technology and new practices, we strive to improve everyday life in Bratislava, as well as the modern functioning of our Municipality.



**Data from
research and
data tools**



**Testing and
prototyping
with residents**



**Partnerships
with private,
public,
and academic
sector**



**Innovation
of the city
services**

This helped us engage residents (I am using residents as a broader term to talk about creative professionals, volunteers or representatives of companies, since the change came for individual actions that were multiplied) who might have felt frustrated. Giving them the right avenues to help, being it volunteering, participating in hackathons or convincing their company to support the city efforts.

It was a very organic process that followed the principles of design thinking and iterated every time it was necessary.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

It is much clearer how they can now collaborate with the city. We are trying to steer their enthusiasm or frustration towards activities that are relevant for the city. The structured way of cooperation is managed by the Living Lab framework or through our annual Climathon event (city-wide hackathon).

DONOSTIA INNOVATION CHALLENGE

LOCATION

Donostia / San Sebastián, Spain

ORGANISATION

Fomento San Sebastián

FUNDING

The programme is totally funded by Fomento San Sebastián, and the total budget is 100,000 euro per round (data from the 2020 round). If we relate this amount to the number of participants, the cost per student is 257 euro.

WEBSITES

www.donostiainn.eus/en/talent-promotion/donostia-innovation-campus/donostia-innovation-challenge

eurocities.eu/latest/eurocities-awards-nominees-2022/

BACKGROUND AND CONTEXT TO GOOD PRACTICE

Donostia Innovation Challenge (DIC) project seeks to equip young people, both in schools, Vocational Training centers and Universities with the necessary skills linked to Innovation. The project involves younger people in the challenges that take place in the city, its businesses and the innovation ecosystem in general. Therefore, it trains them so that, with

the assistance of new technologies, they will be able to generate innovative solutions based on creativity, social innovation and sustainability for the challenges the city has to address in the short, medium and long term. So, we are generating a pool of talented young people adapted to the new realities of the market and of society, with critical thinking and the ability to work in multidisciplinary teams. In short, DIC trains young people in the city so that, through their talent and capacity for innovation, they can design the city of the future. In parallel, the project acts as a complement to the important work carried on in education, focusing on new capacities demanded by the economic framework in today's job market.

In order to devise solutions to the challenge, the teams must integrate an assigned technology thanks to support and collaboration by businesses and technology centres in the city working on this project. The businesses and technology centres are proactive throughout the entire process, staging workshops in relation to technologies, providing materials they have produced themselves, visiting students on the scheme at their respective teaching centres and carrying through technological experiences to bring them to the students etc.

“ we are generating a pool of talented young people adapted to the new realities of the market and of society ”

EDUCATION / TALENT

Development of competences and capacities linked to innovation and aimed at young people in training.



DONOSTIA
INNOVATION
CAMPUS

FOR WHO?

Primary and secondary education
Vocational training centres
Universities
Unemployed young people

WHAT DO WE WORK ON?

Technology
Business management
Design and creativity
Personal skills



Development of capacities

Space for the development of personal skills



Innovation and talent

Personal skills linked to innovation



Collaboration

Educational Centers
Companies
Technology Centers



Drivers

Technology
Business management
Design and creativity
Personal skills



Programming

Awareness activities
Challenges based Training
E-learning gaming platform

This project assists with work on the city's entire value chain, which often lacks connections: human capital/teaching centres/businesses. It also addresses city challenges from a much closer perspective, with a vision of its younger population, with a consolidated strategic training methodology which combines technical capacities with so-called "soft skills", and involving the city's production organisations in the process.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

This programme began in 2017 with a different concept to the current approach. That round of the DIC, in fact, was seen as a programme to implement specific challenges and projects.

In the course of the next round (2018), the decision was taken to involve the city's businesses and technology centres, and for them to present students with their own challenges. 4 companies were involved that year, and the challenges posed related to the specific problems of each business.

In 2019 the decision was taken to adopt the general claim of how to transform and improve the city of Donostia. The reflection behind each decision was primarily based on the fact that we realised that young people are much keener to work on finding solutions to their own problems.

During the Covid-19 pandemic, more than ever before, it was time to make young people the agents of the transformation, design and adaptation of the city to the situation during the worst points in the pandemic.

Far from cancelling the programme, we saw the situation caused by the crisis as an opportunity for digitalisation, helping to consolidate DIC even more, and make it a genuinely useful alternative for teaching centres, which were forced to

cancel all their in-situ training. To carry out the programme, we created a platform to handle the entire process 100% online.

In terms of the actual challenge, we decided to maintain the general claim of improving and designing the city of the future, but we felt it was better to tweak it slightly in relation to the social and health situation at the time. The 2020 challenge therefore lay in seeking innovative ideas to improve the city in the new post-lockdown normality. New challenges, new solutions. This was a complete success, since 64 projects emerged to improve our city and make it more resilient in relation to the new challenges. We therefore consider that the adaptability of the programme to a number of different formats is one of its strengths.

The optimisation and improvement of the process helped boost the impact of the project both quantitatively and qualitatively. Another step had been taken in the consolidation of a stable working methodology, boosting the value chain of students-teaching centres-businesses and technology centres.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

In a totally online format, and in a context that forced even our youngest to spend several months with hardly any social contact, we put Donostia's students to work in teams to come up with new solutions to overcome the city's new challenges. In this way we sought to create a link between the members of the 64 teams, and involve them in the challenge of designing solutions to create a Donostia more capable to address the challenges of the 21st century, a more resilient city, a city where we want to live in the future.

Involving 346 students in secondary education, vocational training centres and universities in this work process for and on behalf of the city and sharing a common goal to the benefit of all its citizens generated a strong sense of cohesion

“ This was a complete success, since 64 projects emerged to improve our city and make it more resilient in relation to the new challenges. ”

and a sense of belonging to Donostia among the students taking part and all the agents involved in the process. One example of this is that, despite the circumstances, 64 projects were created to mitigate the consequences of the largest world pandemic in the last one hundred years: One example was the 2020 round in which students, assisted by the organisations participating, came up with projects that, in the context of the pandemic at the time, sought to generate a positive impact among the people of Donostia, in a bid to solve problems that had arisen due to the health crisis caused by Covid-19: a robot to mitigate the digital gap and the loneliness of elderly people due to the coronavirus, an armband to ascertain whether people infected were ignoring the mandatory quarantine, etc.

In short, on a programme which has now been consolidated, with all its detailed defined, every year we work with the city's entire value chain to help its young people dream together to improve Donostia, with the ultimate aim of creating future generations with all the technical and personal capacities necessary to transform the city in which we live.

LJUBLJANA MUSEUM OF ARCHITECTURE AND DESIGN

LOCATION

Ljubljana, Slovenia

ORGANISATION

Museum of Architecture and Design (MAO)

FUNDING

Ministry of Culture of the Republic of Slovenia

BACKGROUND AND CONTEXT TO GOOD PRACTICE

The Museum of Architecture and Design (MAO) in 2017, at the invitation of the Ministry of Culture of the Republic of Slovenia, established the Centre for Creativity (CzK) – an interdisciplinary platform aimed at the development and promotion of the cultural and creative sector in Slovenia, as well as its integration with the economy and other sectors.

Together with the Ministry of Culture's calls for proposals aimed at promoting creative industries, it supports projects that emerge at the intersection of different creative fields and entrepreneurship and contribute to economic and social progress.

In its almost five years of operation, CzK has organised more than 500 programmes aimed at developing the sector, and recorded 248,000 participants including creators, creative businesses, self-employed freelancers, private and non-governmental organisations, and

other visitors. Of these, almost 500 companies and several thousand creators were involved in specific programmes. Supported by the Ministry's calls for proposals and by the CzK they are developing over 200 innovative products and services, maintaining over 50 collaborations between creators and companies from other economy sectors, and are funding 62 new jobs in creative enterprises. To date, over 100 Slovenian creators and entrepreneurs were represented at more than 60 exhibitions and events in 24 countries around the world. Over the past 5 years the museum offers a multi-layered and connected programme with different strands to suit the needs of creators and creative business and various moments in their development. At the Creative Accelerator, this includes a series of monthly workshops, lectures and related educational activities with content relevant to business and creative activities ranging from brand development, marketing and project management, among others. Activities are intended for different target groups in the creative ecosystem with the aim of meeting the developmental needs of CCS companies in different phases. Due to the Covid pandemic much of the creative accelerator were put on line, additional parts of the creative society were tackled and helped in difficult times.

Creative Incubator is a programme intended for selected creative firms or organisations that despite already having services with clear goals, vision and business potential, wish to refresh the view on their activities or need specialised professional assistance to reach the next step in their growth.

Due to Covid 19 creative incubator support was put on line, but quality support was still provided.

Skillshare is another CzK programme in which successful creative professionals and entrepreneurs, especially Slovenes whose work is widely-known internationally or who have made a name for themselves working abroad are invited to share their skills with others in their field through activities such as lectures, presentations, exhibitions and consulting. The activities offer an important moment for networking as well.

Due to Covid 19 skillshare support was moved online, but quality support continued to be provided. Parts of creative society that had not been involved in the initiative so far joined us online, reach was increased. Other educational and networking activities take place through workshops and presentations prepared alongside CzK's calls for tender as well as through annual conferences related to current issues in specific fields of the cultural and creative sector. In 2019, the two-day conference and pop-up showroom Sistem mode (Fashion System) prepared with the Society for Textile and Fashion Design (SOTO) brought 30 participants from 10 countries to speak about their work and experiences in the fashion industry from design to media as well as presented the work of 20 local fashion designers and their brands.

In 2020, CzK turned its focus to dance with the (non)conference Ples→Denar (Dance→Money) together with Pekinpah Association. Subtitled "Growing Markets: strategies for cooperation", the two-day event sought to fertilise the field of contemporary dance through the shared development of new strategies for international cooperation, presentation and touring among producers and makers of dance art.

In Maribor, the series Pop-Upstart gives young Slovene creatives from various CCS fields a chance to present and promote their products and services to the wider public through sales exhibitions, networking and talks. The aim of the series is to encourage entrepreneurship among creative professionals through the promotion of their innovative, sustainable and well-designed projects.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

The necessity to continue the work of the Center for Creativity during the Covid 19 pandemic and needs of creative sector which was badly hit by lockdown (practically no possibility to work on the market, personal and business challenges that hit the sector) and necessity to continue the envisaged program was a starting point to develop online activities. Due to online activities we got access to parts of creative society that till then didn't actively participate in the network.

Additionally some of the good practices of online trainings have been kept after COVID 19 and we combined with online and in person events, some of the support topics (already recorded) are available online to all interested parties.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

At the beginning of the pandemic it was not easy, but gradually we got a larger audience and some of the creative sector who had not been involved in MOA activities before came on board. We also received suggestions from creative sector on how to upgrade the support and in ways to adjust the content of the certain topics of support that were offered to the creative sector. The knowledge and experience gained have now been inputted into a National Strategy for the creative sector that is now in preparation and good experiences of the approaches developed during COVID 19 (including online events, trainings, working groups work...) will be included further in strategy and in implementation work (action plan,...) and practical work with creative sector in the future.

LISBON CITY COUNCIL COLLABORATIVE PROJECT

LOCATION

Lisbon, Portugal

ORGANISATION

Lisbon City Council – Economy and Innovation

FUNDING

Lisbon City Council + University of Lisbon + U.S. Embassy & Consulate in Portugal

BACKGROUND AND CONTEXT TO GOOD PRACTICE

Academia is rich in ideas to address urban challenges and creativity, but there has always been a barrier obstructing the transfer of this knowledge to the cultural and creative fields (CCF). We addressed the missing link by mapping sociocultural trends in the city of Lisbon by studying emerging behaviour patterns, artifacts and relations with cultural objects and symbolic elements to generate strategic insights that can be used by the local public powers and other actors to help formulate strategies and solutions to solve identified challenges.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

Developed in a post lockdown and pandemic recovery setting where the speed and complexity in sociocultural urban dynamics demanded a fast response from local stakeholders – whether public institutions, social institutions, and business ones. Mindsets, needs and behaviours are changing, demanding for new skills and projects. It was important to understand power relations between the centre and peripheries, addressing race, gender, sexual orientation, economic classes and access. Identity and representation concepts and theories bring added complexity to the research and must be a centre issue in the research. As a result of all this context, inequalities grow or arise and there is a pressure to meet audience’s expectations for a better and more sustainable life in the urban ground. In this context, we can still promote the development of creative and cultural projects as way to empower communities/individuals, to develop solutions for urban challenges and inequalities that arise from deep, and sometimes almost invisible, macro sociocultural changes.

“ **Identity and representation concepts and theories bring added complexity to the research and must be a centre issue in the research.** ”

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

This project is twofold. (1) It maps Lisbon's manifestations, patterns and signifying practices that come from emerging and growingly changing macro sociocultural changes. It does this in the physical and digital grounds to gain a greater understanding of challenges and impactful creative signals/projects/behaviours/objects that address the changes and that harness their nature. We began by cross-referencing theories, concepts and methods in cultural studies, trend studies and cultural sociology: research in literary review, secondary data explorations, urban immersions, expert workshops, digital research, and hermeneutical analysis. (2) With the gathered information of the former stage, we are now ready to produce two sets of reports that will highlight the manifestation of sociocultural trends and Lisbon and the main emerging cultural and creative practices. These reports, although scientific in their nature, will be oriented towards local powers, social, and economic stakeholders. Their main objective is to generate insights on both challenges and insights for solutions. Both identified challenges and insights will be long worked with Lisbon's City Council (CML) to ideate possible practical solutions in the terrain, while also promoting better guidelines for political action:

- theoretical, regarding the development of a model and protocols better equipped to understand urban sociocultural changes in ways that can easily be transferable to the CCF;
- methodological, concerning the possibilities of transdisciplinary research and cooperation with stakeholders beyond academia;
- in the area of knowledge creation, to a) contribute to the consolidation of Trend Studies and b) offer a conceptual model for mapping trends in an urban context.
- in the area of knowledge exchange and transfer, to a) build a Collaborative

Innovation Network (COIN) associating R&D units with local partners in the CCF; b) provide solid bodies of work with an applied and strategic orientation; and c) promote workshops for problem solving that involve R&D units, partners and stakeholder communities.

- Consolidation of FLUL's American Corner as a maker space for the Humanities and Social Sciences, targeting sociocultural and creative challenges;
- Development of in-depth reports on the manifestation of major sociocultural trends in Lisbon with a solid methodological background that articulate different methods from Social Sciences and Humanities. These reports, with a scientific background, will be an important strategic input for city hall and the project in the development of strategies and solutions for identified problems.
- Using the American Corner (see 5.) and the results of the reports (see 6.), we will develop ideation processes between social stakeholders, including CML, in the form of hackathons and workshops (see 2.) for the identification and development of strategies and solutions to help solve identified challenges and propose new support pathways for the development of cultural and creative projects as a way of empowerment and social development.

“ These reports, although scientific in their nature, will be oriented towards local powers, social, and economic stakeholders. ”



VILNIUS ENERGY AND TECHNOLOGY MUSEUM

LOCATION

Vilnius, Lithuania

ORGANISATION

Energy and Technology Museum

FUNDING

Vilnius City Municipality, Vilnius Heating Network (CHC), Lithuanian District Heating Association (LDHA), National Lithuanian Energy Association (NLEA) and the Lithuanian Electricity Association (LEA).

BACKGROUND AND CONTEXT TO GOOD PRACTICE

The Energy and Technology Museum was closed due to global pandemics during the periods from March 13th to May 12th, 2020, and from November 7th, 2020, to April 10th, 2021.

During mandatory quarantine the flow of visitors has decreased significantly, and so has direct revenue. Wages of the employees were reimbursed by state subsidies for staff maintenance, additional financial contributions from stakeholders and various funding programmes (Lithuanian Council for Culture, Vilnius City Municipality). The problem of rising prices was solved by reducing costs during the time of museum closure.

However, this situation called for quick adaptation to remote work and alternative activities. Quarantine time was used to develop virtual museum services and provide an access for visitors online:

- Exhibitions were digitized and published online.
- Existing educational programs were adapted, new remote educational programs were created and conducted.
- A virtual 3D tour of the museum was created.
- The etm.lt website was updated.
- Social network communication was expanded, short videos about museum exhibits and expositions were filmed.
- 4 new educational spaces were established and equipped.
- Preparatory work of a new exhibition space (Transformation Hall) started.

“ During mandatory quarantine the flow of visitors has decreased significantly, and so has direct revenue. ”

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

The approach was applied immediately once the lockdown started, and it continued afterwards. The main goals of museum staff were to maintain full-time jobs, offer services to the education sector as well as to prepare for the re-opening while attracting the same number of visitors as before.

For this purpose, new ideas were generated, and creative activities were carried out. Thanks to this, some of the most successful projects were developed and implemented during the quarantine, and presented after the last lockdown:

- ETM Kid's stop.
- Outdoor exhibition "Light Writings. Industrial Aesthetics".
- Adapting museum exposition to ensure accessibility for blind or visually impaired.
- "Upcycling: Bring Old Electronics to New Life".
- New educational programs "Universe in a Jar", "Plastic from Milk".
- Concert cycle and many other activities.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

Although some negative residual effects of the Covid-19 pandemic have been observed since the reopening of Energy and Technology Museum on April 10th, 2021 (e.g., increased prices, financial challenges, changed habits and needs of the visitors, etc.), innovative practices and creative approaches also had a strong positive impact on surrounding community. Online activities are still being carried out throughout Lithuania and this contributes to the process of cultural decentralization. Museum staff focuses more on cultural and educational projects that attract not only families, schoolchildren, teachers, and students, but also artists, creative makers, scientists and other communities.

Visitor attendance at the museum began to rise. In 2019 the museum had more than 13 000 visitors. During the pandemic year of 2020 – number of visitors exceeded 11 000. In 2021 the museum was open for the public from April to December and had more than 31 000 visitors. This year (from January 2022 to June 2022) about 27 000 people visited the museum. The visitor growth is proportional and growing every year. The makerspace community strengthened its ties and used creative ways to self-sustain its activities during the pandemics.

“ The makerspace community strengthened its ties and used creative ways to self-sustain its activities during the pandemics. ”



ZAGREB NIKOLA TESLA TECHNICAL MUSEUM

LOCATION

Zagreb, Croatia

ORGANISATION

Technical Museum Nikola Tesla

FUNDING

Interreg Europe

BACKGROUND AND CONTEXT TO GOOD PRACTICE

Within Urban Manufacturing Project / Makers Community Hub Zagreb Pilot Project, Technical Museum Nikola Tesla in collaboration with Radiona.org (as coordinator) implemented "Summer at Tesla" programme. The programme consisted of 23 STEM/STEAM workshops from the following spectrum: biology, environment, recycling / upcycling, green crops, renewable energy, design, creativity and electronics. It was conceived as a narrative ranging from green living and home economics to creative uses of materials and objects through the basics of electronics, modelling, programming, robotics and 3D printing. The program also included specialized areas such as working on prototypes through design thinking to raise awareness of the entrepreneurial mind-set and specialized professional programs for craftsmen.

Total of 14 stakeholders from the non-profit, for-profit and arts sectors were included in program: Algebra, Bioteka, Gradionica – LEGO education,

Faculty of Civil Engineering - University of Zagreb, Faculty of Graphic Arts - University of Zagreb, Croatian Association of Technical Culture, Croatian Robotics Association, Impact Hub Zagreb, Institute for Youth Development and Innovation (IRIM), ODRAZ - Sustainable Community Development, Zagreb Chamber of Crafts, Radiona - Zagreb Makerspace, independent artist Nina Iris Beslic, Green Network of Activist Groups - ZMAG.

The program was open for the public and has gathered 193 participants aged from 4 to 55+. Out of 23 workshops 9 were intergenerational, 4 were for adults, 3 for children aged 6 to 10 and 7 for children and youth from 10 to 18. All workshops were held live in Technical Museum Nikola Tesla during 11 weeks, starting from July 2021 until the end of September 2021.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

The program "Summer at Tesla" was conducted in a "classic" live / face-to face format with intention to enable in-person interactions and intensive group-based collaboration and socialising that wouldn't be possible in virtual format. Although it proved to be quite challenging during the pandemic and implied lots of consultations between the Museum, coordinator/Radiona.org and stakeholders, elaboration of different scenarios depending on

epidemic situation, adaptation of workshops to a hybrid form in case of outbreak of infection, and postponing of implementation to a summer season that is considered to be least risky, a live workshops turned out to be a good decision.

The program was launched in July 2021. Considering that during the school year 2020/2021 schooling took place in hybrid format (mostly online) the children and youth were eager to socialize live and interest in participation in workshops was exceptionally high. Still, in order to reduce the risk of infection to a minimum, all of the workshops were limited to maximum of 10 participants and standard protection measures (such as placing hand sanitizers at the entrance, thermo check upon entry, having staff and participants wear masks and regular room ventilation) had to be applied. Fortunately, during almost three months of workshops there was no case of infection, all planned workshops were held, and despite the limited number of participants, almost all persons that showed interest in participating were able to attend at least one workshop.

Although virtual events have their advantages and are not epidemiologically risky, holding live workshops proved that people, especially children, have a strong need to learn and develop new skills in a non-virtual environment where they can smell and touch things and interact with their colleagues.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

Gathering a number of organizations, institutions and an independent artist through implementation of the pilot project Makers' Community Hub in a program that lasted over 11 weeks and was open to all types of STEM / STEAM educational experiments turned out to be a great success with many benefits for the Zagreb's makers community and also for Museum.

“ Successful program implementation has proven that museums can provide a platform for bringing together different stakeholders ”

Great public response to program and very good media coverage (over 30 announcements on the Croatian National Radio and Television, local TV channels and radio stations, plus numerous announcements published on portals and in the print media), made the maker culture in Zagreb and its representatives more visible and recognizable.

Interest and positive reactions of program participants, from children and their parents and grandparents, to youths and other interested citizens, had a positive impact on a new audience development, with potential of becoming active participants of the maker community. The combination of diverse stakeholders included in the program brought an atmosphere of competent open dialogue, ideal for establishing new collaborations and producing new innovative interdisciplinary programs.

Successful program implementation has proven that museums can provide a platform for bringing together different stakeholders, encouraging collaboration and creating new community hubs. Cooperation established during the project will continue through the development of new collaborative programs and project.



ZAGREB MAKERSPACE - RADIONA

LOCATION

Zagreb, Croatia

ORGANISATION

Radiona – Zagreb Makerspace

FUNDING

Ministry of Culture and Media of the Republic of Croatia, City of Zagreb, Kultura Nova Foundation, Erasmus+ (CreMa project), Erasmus+ (Creative School project)

BACKGROUND AND CONTEXT TO GOOD PRACTICE

Taking into perspective the Covid-19 restrictions and switching to digital areas, Radiona has decided to build the capacity of makers and the wider public in domains of digital literacy, meaning giving a voice to people through different technology solutions and skill sharing..

For example, hosting online workshops from beginner through to intermediate and advanced levels including:

- Online streaming: Teaching the basics of online streaming, from camera to audience, streaming production, streaming equipment and how to make a portable/ home studio.
- Podcast: How to start a podcast.

- Video editing: Video editing for beginners, Video editing with the DaVinci Resolve programme.
- Film making: How to make your movie with a mobile phone.
- Motion captioning: MoCap possibilities in Arts and Culture.
- Design: Digital vocabulary including; designing stickers for Viber and other text messaging tools.
- GPS technology and privacy on the internet: Why a calculator wants to know my location?
- Lighting: Exchanging knowledge on lighting solutions for a home broadcasting studio.

A special effort was made to start building DSP (Digital signal processing) online communities which are gathered around a specific software, like: MAX/MSP, Blender 3D, Pure Data, SuperCollider and TouchDesigner.

“ Radiona has decided to build the capacity of makers and the wider public in domains of digital literacy ”



Additionally, the topics of analogue, digital and granular synthesis were covered in the online sessions. This made it possible to create a new environment for diverse audiences, present makers and future makers. Giving these opportunities to a wider audience and sharing knowledge on social media (via YouTube channels), brought a more diverse and intergenerational audience into the area of maker culture and knowledge transfer.

WHY WAS THE APPROACH DEVELOPED OR INTRODUCED? WAS IT DURING THE LOCKDOWN OR POST LOCKDOWN I.E. PANDEMIC RECOVERY?

The approach was made immediately during the lockdown and it continued after the lockdown due to the success of gathering a wider audience. These were also examples of practice that we used than as a piloting for European projects, like Erasmus+, in order to test them and improve details for the future education materials for makers and maker communities.

The costs for producing education materials, disseminating it via online platforms and buying equipment: 20.000 EUR.

WHAT HAS THE IMPACT BEEN ON THE MAKERSPACE/MAKER COMMUNITY OR INNOVATION ECOSYSTEM?

We have a significantly bigger reach with our online or offline sessions. It has brought us diversity of professions and all generations included. We were able to start building new communities around specific topics, or to enhance already existing communities with new members. Additionally, the lab invested a certain amount of money in new equipment that we had to adapt and learn in order to be use and teach - like microphones, video mixers, voice recorders, lighting solutions, green screens, studio props, cameras, tripods, gimbals, etc.

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