D10.4 | Report on Cooperation Activities

F6S Network Limited (F6S)

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Abstract	This deliverable is a report on the cooperation activities carried out within iPRODUCE between M1 (January) and M12 (December 2020). The cooperation activities are presented from two perspectives: the cooperation activities carried out are addressed from two approaches: (1) cooperation between iPRODUCE and other external projects, initiatives and/or activities, and (2) cooperation involving specific iPRODUCE partners and stakeholders. A significant number of cooperation activities have been carried out, which are expected to expand in the forthcoming months of the project.

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PU	Public	X
PP	Restricted to other programme participants (including the EC services)	
RE	Restricted to a group specified by the consortium (including the EC services)	
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iPRODUCE ● Grant Agreement: 870037 ● Innovation Action ● 2020 – 2022 | Duration: 36 months

Topic: DT-FOF-05-2019: Open Innovation for collaborative production engineering (IA)

Executive Summary

This deliverable is "D10.4 – Report on cooperation activities" of the iPRODUCE project, funded by the European Union's H2020 programme.

The objective of this deliverable is to provide a review of the cooperation activities carried out within iPRODUCE from January 2020 to December 2020. Deliverable D10.4 is the first of three reports addressing cooperation activities, the following two – D10.5 and D10.6 – to be delivered by M28 and M36, respectively.

Within the framework of this deliverable, the cooperation activities carried out are addressed according to two angles: (1) cooperation between iPRODUCE and other external projects, initiatives and/or activities, and (2) cooperation involving specific iPRODUCE partners and stakeholders.

Cooperation with projects and initiatives

Task 10.3 of iPRODUCE specifically focuses on fostering clustering and cooperation activities with relevant projects and initiatives. iPRODUCE has engaged with several Horizon 2020 projects, including those funded under the DT-FOF-05-2019 - Open Innovation for collaborative production engineering topic and other projects that share similar objectives, themes, sectors, or target audiences.

Cooperation with projects under the DT-FOF-05-2019 topic

iPRODUCE has engaged with three projects under the DT-FOF-05-2019 topic, which also funded iPRODUCE. These projects are DIY4U, INEDIT and OPENNEXT, and the cooperation established was:

- **DIY4U** (*coordinated by SINTEF*). A first meeting was held on 19 February 2020. The main activities thus far have been the mutual presentation of the two projects. DIY4U plans to organise seminars in which iPRODUCE could participate. A second call was held on 10 September 2020, where it was agreed that more time is required to fine-tune cooperation opportunities.
- **INEDIT** (*coordinated by ENSAM*). One meeting was held on 5 May 2020 focused on the presentation and discussion of the two projects. Follow-up contacts are to be made once iPRODUCE's activities are more advanced.
- **OPENNEXT** (*coordinated by TU Berlin*). A first meeting was held on 31 January 2020 with a mutual introduction of the two projects. Opportunities for synergies have been identified, particularly in customised furniture, and that additional partners from both projects should be involved in more extensive discussions. A second meeting was held on 15 September 2020 to further discuss topics addressed in the first meeting and the involvement of additional partners. The meeting culminated with an invitation for OPENNEXT to participate in the iPRODUCE online event which was organised in November 2020.

Cooperation with other projects with similar themes

iPRODUCE has reached out to two additional H2020 projects – Pop-Machina and Reflow – which share themes common to those addressed in iPRODUCE. A first meeting was held on 22 June 2020 and focused on the presentation of the objectives and identification of preliminary ideas for

cooperation. It was agreed that cooperation would start with engagement through social media and would later expand on that. A second meeting was held on 27 July 2020. Among others, it was agreed that there are several topics common to the projects to be explored at a later stage, that an online event could be an interesting common activity for the projects, and that social media engagement should continue. Pop-Machina was later invited to be a speaker at the iPRODUCE online event.

Cooperation via organisation of/participation in events

iPRODUCE online event

iPRODUCE organised its first event on 26 November 2020 titled '**The Social Manufacturing Paradigm: co-creating with manufacturers, makerspaces, and consumers**' with the objective of promoting a discussion regarding the role of makers and consumers in the social manufacturing landscape. In addition to an introduction to iPRODUCE, the event included two keynote speeches and presentations from two projects that iPRODUCE is collaborating with: Pop-Machina and OPENNEXT.

Attended by 68 people, mainly from the academia/research, start-ups/SMEs and the industry and maker communities, the event was in general well received by the participants. Regarding the opportunity it presented to foster cooperation, it is considered that it was a valuable contribution. The event not only facilitated the engagement with two prominent actors in the maker scene, which may in the short to mid-term be relevant actors in the project, but also engaged with the two projects, which helped increase the awareness of iPRODUCE among the projects' networks

External events

iPRODUCE participated in two large external events: FABxLive 2020 and EFECS 2020.

For FABxLive 2020, which ran from 27-30 July 2020. iPRODUCE submitted a three-minute video that presented the project's context, its main objectives, the cMDFs, and the expected outputs and impacts. Through its participation in the event, iPRODUCE was later contacted by a representative of the Fab Foundation, also representing Fabricademy, Textile and Technology Academy, which showed interest in the project. A follow-up meeting was held on 28 October 2020 between iPRODUCE (represented by F6S) and the representative, which served to discuss how iPRODUCE could engage with the academy.

For EFECS 2020, which ran from 25-26 November 2020, iPRODUCE participated with a virtual booth, where engagement with event attendees was done through the booth. The total number of visits to the iPRODUCE booth was five people, resulting in limited interaction and contributions for cooperation.

Cooperation and engagement activities within cMDF

Until December 2020, the partners of several iPRODUCE cMDFs – Germany, Denmark, Spain, and Greece – have been active in engaging local stakeholders and pursuing potential cooperation opportunities to bring these into the project or make them aware/ active in the cMDF activities.

German cMDF

To foster cooperation and activities within the German cMDF, a workshop series was organised to present innovation methods, digitalization possibilities and manufacturing capabilities of the MakerSpace Bonn, but also the maker movement in general. The target audience of the workshops consists of consumers, R&D institutions, and mainly SMEs from Germany.

To date, five workshops were implemented, running (almost) monthly and addressing different topics, such as methods and tools for the maker community, design thinking, and others. Due to the limitations imposed by the COVID-19 pandemic, the workshop series was carried out online. A standard agenda was defined for the workshops, each running for approximately 90 minutes and including three agenda items: brief introduction of participants, presentation, or interactive training by the cMDF with varying topics, feedback round (Q&A).

As a result of these workshops, follow-up activities were established with several contacts within the network of the German cMDF, with a greater focus being put on collaboration opportunities between SMEs and the German cMDF. Furthermore, the workshop series is expected to continue in the coming months following a hybrid format.

Danish cMDF

The Danish cMDF partners have engaged and cooperated with local stakeholders in five public events that were carried out starting in the summer, and with the following results:

- **Danish cMDF kick-off event** (27 August 2020): Focused on cooperation and partnerships, including the availability of an open and in-development workspace, the opportunity for stakeholders to build 1:1 scale prototypes, and the opportunity to offer unique services to other private companies.
- **School co-creation workshop** (27 August 2020): Explored the adaptation of the traditional business model canvas into a project value canvas (PVC) to understand how to best address and collaborate with schools.
- **Women makers workshop** (7 October 2020): Focused on cooperation and the promotion of inclusion and included discussion points related to having a set of open courses to bring different groups to the space; the possibility of being part of a network which would generate opportunities and inspiration; the access to a support network database that can help accelerate production; among others.
- **2nd school co-creation workshop** (22 October 2020): Mainly involved follow-up discussions from the first school co-creation workshop.
- **2nd Women makers workshop** (29 November): Allowed to establish a collaborative interdisciplinary and diverse maker network; allowed for participants to learn about technologies, such as digital prototyping hardware tools.

Through the workshops organised to date, the Danish cMDF has already established several cooperation activities that it will build on in the coming months of the project.

Spanish cMDF

The Spanish cMDF partners have engaged in several activities to increase awareness among their target stakeholders and to establish potential cooperation opportunities:

- **Meeting with Spanish makerspaces** (26 June 2020): A meeting was organised with six Spanish makerspaces with the objective of discussing experiences and practices in the domain of digital manufacturing. The information collected was also used in deliverable D2.3 - Benchmarking Report on Makers Approaches and Tools for collaborative production engineering. This meeting proved to be important to engage with different makerspaces and to set foundations for cooperation in the future by their participation in a wider Spanish cMDF.

- **Participation in the "Create in the classroom, the importance of the University FabLabs" event** (24 September 2020): A representative of the FabLab VLC participated in an online event that focused on university fab labs: specialised training, relations between the university and the business world and scientific and technical research. Organised by the University of León (Spain).
- **Participation/ organisation of HABITÁT Congress** (22 October 2020): iPRODUCE was present at the HABITÁT Congress, supported by a promotional video of the Spanish cMDF. The event was an opportunity to engage with different professionals of the home furnishing sector.
- **Participation in the "Makerspaces: digital manufacturing, motivation and learning" event** (27 November 2020): A representative of FabLab VLC participated in an online multiplier event organised within the framework of the Make in Class Erasmus+ project, where iPRODUCE was presented from the perspective of the social manufacturing concept that is being proposed within the project.

Greek cMDF

The Greek cMDF focuses on the medical sector, being the reason why many of the engagement and cooperation activities having been targeted to stakeholders in that sector. A selection of cooperation activities carried out by the Greek cMDF include:

- Meetings with orthopaedic key opinion leaders for feedback on medical prototypes and their commercial exploitation.
- Partner AidPlex led the COVID-19 Response Greece initiative, which delivered more than 50.000 face shields all over Greece. Partner CERTH also engaged in the *fight* against COVID-19, namely at the institutional level.
- AidPlex organised meetings with Asteriskos and Patras Science Park (Patras Based Fablabs) to examine how other fab labs achieve efficacy with other makers.
- AidPlex had meetings with Super Relief to support them with the design thinking process on how they can make their products more "kid friendly". It is considered that this initial engagement is a strong possibility for cooperation in the upcoming months.
- CERTH/ITI signed a memorandum of understanding with the Digital Manufacturing and Materials Characterization Laboratory of the International Hellenic University.
- CERTH/ITI opened its additive manufacturing facilities for social manufacturing, involving different Greek companies.

Final considerations

iPRODUCE has looked to engage with different stakeholders and initiatives in pursuit of establishing synergies and cooperation opportunities. It is considered that these efforts have been, in the most part, successful. Not only has iPRODUCE established a stronger presence amongst several of the project's main stakeholder groups (though interactions carried out by cMDFs), but it has also initiated collaborative activities that are expected to continue in the following years of the project. Furthermore, by engaging with external projects/ initiatives, iPRODUCE is also increasing its visibility among the networks of those projects/ initiatives, which in the short to medium-term can also be of benefit to the project.

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1. Introduction

This deliverable is D10.4 – Report on cooperation activities of the iPRODUCE project, funded by the European Union's Horizon 2020 programme.

The objective of this deliverable is to provide a review of the different cooperation activities carried out within iPRODUCE from January 2020 to December 2020. Deliverable D10.4 is the first of three reports addressing cooperation activities. The following two reports –D10.5 and D10.6 – are to be delivered by M28 and M36, respectively.

Although cooperation activities will be done across the project, iPRODUCE has a specific task that aims to foster cooperation: Task 10.3 - Clustering and cooperation with relevant initiatives. Within this task, the objective is to identify and establish synergies with similar and/or complementary projects. More specifically, this engagement will aim to attract attention and initiate joint activities with makers' communities, consumer product companies and experts on co-creation and particularly user driven innovation.

Therefore, and within the framework of this deliverable, the cooperation activities carried out will be addressed from two perspectives: (1) cooperation between iPRODUCE and other external projects, initiatives and/or activities, and (2) cooperation involving specific iPRODUCE partners and stakeholders (mainly within the framework of the cMDF).

In general, it is considered that the engagement and cooperation activities established in the first year of the project were, in the most part, successful and of value to the project. Through these efforts, iPRODUCE is now known by a larger number of different stakeholders of interest to the project and has also established a stronger presence in different networks. Although some of these cooperation activities are in a very initial stage, they have provided a foundation for new opportunities in the forthcoming months, especially as the project matures and more results become available that can be disseminated to the project's array of stakeholders from the defined target groups.

This deliverable is structured into several sections with the following objectives:

1. **Introduction**: the present section.
2. **Cooperation with projects and initiatives**: presents a review of the engagement and cooperation activities carried out with several H2020 projects that are funded under the same topic as iPRODUCE or share similar themes/ concepts. It also presents engagement activities through the organisation of and participation in events.
3. **Cooperation and engagement activities within cMDFs**: presents a review of the cooperation and engagement activities carried out by four of the projects cMDFs: Germany, Denmark, Spain, and Greece.
4. **iPRODUCE partners' cooperation against COVID-19**: presents an overview of some of the cooperation activities carried out by several iPRODUCE partners in the fight against COVID-19.
5. **Final considerations**: presents a final reflection on the information presented in this deliverable.

2. Cooperation with projects and initiatives

As presented in the Introduction section, Task 10.3 of iPRODUCE specifically focuses on fostering clustering and cooperation activities with relevant initiatives, including other R&D projects.

As such, from January to December 2020, iPRODUCE has looked to engage with several different Horizon 2020 projects. These include projects that have been directly funded under the H2020 topic that funds iPRODUCE - **DT-FOF-05-2019 - Open Innovation for collaborative production engineering** - as well as other projects that share similar objectives, themes, sectors, or target audiences.

iPRODUCE partner AIDIMME leads the clustering and cooperation activities with these H2020 projects and initiatives. The work being performed involves identifying similar projects to establish collaborations with them. By doing so, such cooperation will initially create awareness while initiating joint activities with makers' communities, manufacturing companies and professionals in the co-creation arena, and in the end will encourage user-driven innovation. Cooperation activities are intended to encompass, for example, the joint organization of dissemination events and other exploitation opportunities with these projects in view of promoting iPRODUCE beyond the scope of the project. Table 1 shows a list of identified projects along with their respective coordinator.

Table 1. Projects that iPRODUCE has engaged with in view of fostering cooperation

Project		Project coordinator
DIY4U	**DIY4U**	SINTEF
INEDIT	**INEDIT**	École Nationale Supérieure D'arts et Métiers (ENSAM)
OPEN! NEXT	**OPENNEXT**	TU Berlin
Reflow	**Reflow**	Copenhagen Business School
	Pop-Machina	KU Leuven

2.1. Cooperation with projects under the topic: FOF-05-2019 - Open Innovation for collaborative production engineering

In addition to iPRODUCE, the DT-FOF-05-2019 - Open Innovation for collaborative production engineering funds three additional projects:

- DIY4U: Open Innovation Digital Platform and Fablabs for Collaborative Design and Production of personalised/customised FMCG
- INEDIT: open INnovation Ecosystems for Do It Together process
- OPENNEXT: Company-Community Collaboration for Open Source Development of products and services

The specific cooperation activities carried out with these three projects over the past 12 months as well as planned activities are detailed in the sections below.

2.1.1. DIY4U

Project overview

DIY4U[1] - Open Innovation Digital Platform and Fablabs for Collaborative Design and Production of personalised/customised FMCG[2] (1 November 2019 - 31 October 2022), coordinated by SINTEF (Norway), aims to develop, and promote the adoption of collaborative production engineering approaches in the Fast-Moving Consumer Goods (FMCG) sector. The concept is an extension of the format for paint customization at a DIY store where they can make any small quantity of any colour a customer requires. (...) DIY4U will address the blockers of product customisation and small-scale manufacturing by developing an Open Innovation (OI) digital B2B/B2C platform and small-scale automated manufacturing machines (fab labs) for collaborative design and production of personalised/customized FMCG.

Review of interactions and cooperation activities

A first contact was held on 19 February 2020. Both AIDIMME and SINTEF introduced their respective projects and started to comment on the projects' scope and approach. The DIY4U coordinator explained the project's vision, which addresses product customisation and small-scale manufacturing offering a business opportunity by developing an Open Innovation (OI) digital B2B/B2C platform for collaborative design and production of personalised fast-moving consumer goods. In turn, AIDIMME introduced iPRODUCE´s vision, objectives and its six pilots. No specific synergies between the products were defined in this first meeting. SINTEF mentioned that DIY4U would be organizing specific seminars, starting in Norway, about personalization and product customisation, and they would inform iPRODUCE about their training activities as well. SINTEF also commented about the SHAREBOX[3] project and suggested iPRODUCE to consider them for potential synergies. Both projects agreed to keep in contact for possible dissemination events.

A second call took place on 10 September 2020. This time it was participated by the DIY4U project manager. No specific outcomes were agreed, with exception that more time would be required to fine-tune specific cooperation activities between the projects.

[1] DIY4U website: *https://www.sintef.no/projectweb/diy4u/*
[2] DIY4U on CORDIS: *https://cordis.europa.eu/project/id/870148*
[3] SHAREBOX project website: *http://sharebox-project.eu/*

2.1.2. INEDIT

Project overview

INEDIT[4] - open INnovation Ecosystems for Do It Together process[5] (1 October 2019 - 30 September 2022), coordinated by ENSAM (France), aims to create an ecosystem to transform the DIY approach within FabLabs into a professional DIT approach. It will capitalise on the knowledge, creativity and ideas of design and engineering conceptualised by interdisciplinary stakeholders and sometimes even new actors. To demonstrate the potential innovation around social manufacturing within the circular economy, the project will test it in four cross use cases: sustainable wood panels manufacturing and 3D-printing of wood, 3D printing of recycled plastic and 'smartification'.

Review of interactions and cooperation activities

A single meeting has taken place thus far, held on 5 May 2020, and involving the INEDIT dissemination manager. The objective and main outcome of the meeting was the presentation of each project. Follow-up contacts will be made in the next year once iPRODUCE's activities are well under way and more specific cooperation actions can be discussed.

2.1.3. OPENNEXT

Project overview

OPENNEXT[6] - Company-Community Collaboration for Open Source Development of products and services[7] (1 September 2019 - 31 August 2022), coordinated by TU Berlin (Germany), aims to encourage and support SMEs to unleash open-source hardware's (OSH) potential through company-community collaborations (C3). It will use case studies to prove C3 feasibility, provide SMEs with needed infrastructure and business support to integrate the designs into marketable products, and, most importantly, it will invite and rely on the participation of consumers and citizens in a project that will lead to new user-friendly products.

Review of interactions and cooperation activities

The first meeting with OPENNEXT was on 31 January 2020. Both projects introduced themselves and started to comment on each project's scope and approach. OPENNEXT's approach is through the concept of Open FabLabs working in open source, which are online communities for developing products in open source with IT solutions, testing prototypes, improving their innovation capacity, and reaching industrial SMEs. The understanding is that at the end of the project they will create an Open Lab Alliance.

When addressing the industries that OPENNEXT covers - (1) Mobility eco-friendly, (2) customised furniture, and (3) design for events for big companies - it was clear that some synergies exist, namely regarding the customised furniture topic.

It was agreed that the various partners working on this topic should be engaged. Specifically, Stykka (from OPENNEXT) and betaFACTORY (from iPRODUCE), both being from Denmark, could initiate discussions. Other topics for cooperation are related to the medical pilot being addressed in

[4] INEDIT website: https://www.inedit-project.eu/
[5] INEDIT on CORDIS: https://cordis.europa.eu/project/id/869952
[6] OPEN_NEXT website: https://opennext.eu/
[7] OPEN_NEXT on CORDIS: https://cordis.europa.eu/project/id/869984

iPRODUCE's Greek cMDF, where OPENNEXT suggested that the project contact the Careables[8] project, an open and inclusive approach to healthcare platform, with the coordinator ZSI (Barbara) in Vienna. It was also identified that OPENNEXT partner WikiFactory, focused on design for manufacturing, could be an interesting channel for cooperation between projects.

The discussion also identified more specific connections between partners/ countries of the two projects:

- **Germany**: Partner **IPK** (*OPENNEXT*) <> Partner **FIT** (*iPRODUCE*)
- **France**: Partner **Grenoble Institute of Technology** (*OPENNEXT*) <> automotive/ mobility use case of the **French cMDF**(*iPRODUCE*)
- **Denmark**: **Danish Design Centre** (*OPENNEXT*) <> Partner **betaFACTORY** (*iPRODUCE*)
- Careables project ZSI Vienna and WikiFactory (*OPENNEXT*) <> medical pilot of the **Greek cMDF** (*iPRODUCE*)

A second meeting was held on 15 September 2020, with the participation of OPENNEXT coordinator, and AIDIMME and F6S from iPRODUCE. In addition to some follow-up discussion on the topics addressed in the first meeting (e.g., moving forward with an interaction between partners betaFACTORY and Stykka), other cooperation actions were discussed.

iPRODUCE representatives mentioned their intention of organising an online event for the end of 2020 and that OPENNEXT could potentially be an interesting option for a speaker. OPENNEXT also mentioned they were planning some events and that they would assess how iPRODUCE could eventually take part in them.

After this second meeting, and with iPRODUCE having moved forward with the organisation of their online event, iPRODUCE formally invited OPENNEXT to deliver a presentation at the event in the slot specifically dedicated to iPRODUCE collaboration activities. Additional details on the event are provided in section 2.4.1.

2.2. Cooperation with other projects with similar objectives and themes

As aforementioned, iPRODUCE also aims to engage with other projects that share similar objectives, themes, sectors, or target audiences. In that regard, iPRODUCE has reached out to two H2020 projects: Pop-Machina and Reflow. It should be noted that these two projects are of particular interest because several iPRODUCE partners are also beneficiaries in one or the other projects.

The iPRODUCE DoA highlights that there is already a planned a collaboration with the Pop-Machina project to assess how some of the maker spaces/ innovation communities could share their facilities for the purposes of the iPRODUCE local cMDF in Thessaloniki, Greece. Furthermore, it mentions that additional areas for collaboration may include interoperability between industry IT tools and OI tools, standardisation issues, occupational health, and safety issues, etc. Other joint activities may include the co-organisation of dissemination events and collaboration on horizontal aspects, such as business modelling.

[8] Careables project: https://www.careables.org/

2.2.1. Pop-Machina

Pop-Machina[9] - Circular collaborative production in urban areas[10], coordinated by KU Leuven (Belgium), aims to create a network of existing and new communities in urban areas, and use cutting-edge technologies (factory-of-the-future, blockchain) to engage urban planning, boost social dialogue, recognise local needs in training and skills development. Successful case studies will be learned from to develop a framework for implementing circular collaborative production in urban areas. This framework will be tested in living labs in seven cities: Leuven (Belgium), Thessaloniki and Piraeus (Greece), Kaunas (Lithuania), Venlo (The Netherlands), Santander (Spain), and Istanbul (Turkey).

2.2.2. Reflow

Reflow[11] - Co-creating circular and regenerative resource flows in cities[12], coordinated by Copenhagen Business School (Denmark), aims to offer a new approach to circular economy in urban areas. Reflow will provide best practices aligning market and government needs to create favourable conditions for the public and private sector to adopt circular economy practices. Reflow will create new circular economy business models within 6 pilot cities: Amsterdam, Berlin, Cluj-Napoca, Milan, Paris and Vejle and assess their social, environmental, and economic impact. In each of the pilots, citizens will be involved in developing and testing circular products, software, and business models for their own city.

2.2.3. Overview of cooperation with Pop-Machina and Reflow

The cooperation activities with Pop-Machina and Reflow are described together as all interactions were done with participation of the three projects. It is also relevant to note that Pop-Machina and Reflow had already established some cooperation before engaging with iPRODUCE.

A first meeting was held on 22 June 2020 with the dissemination leaders and other partners of the three projects: AIDIMME, WR, CERTH, F6S and Fablab BCN. The objective of this meeting was to carry out an initial presentation of the three projects to identify common themes, objectives, and project activities. Based on this introduction, the representatives of the three projects discussed preliminary ideas for cooperation, including recurrent engagement through social media (e.g., sharing of posts on Twitter and Linked), news posts on project websites addressing multiple project's activities, and organisation of online events addressing themes of common interest. It was agreed that the projects would reflect on more specific activities that could be explored with short to long-term cooperation in mind.

A second meeting was organised on 27 July 2020, participated by the dissemination leaders of the projects. Prior to the meeting, iPRODUCE prepared a document with a detailed review of Pop-Machina and Reflow and their respective activities to better understand potential cooperation opportunities. From the discussion, the main outputs were:

- Agreement that there is a baseline for collaboration based on project topics (e.g., production/ manufacturing, citizen engagement and participation, fab lab/ maker movement, circular economy, ...).
- The organisation of an online event (co-organised by the three projects or by one project with participation of the others) is an activity that could be interesting to explore.

[9] POP-MACHINA website: https://pop-machina.eu/
[10] POP-MACHINA on CORDIS: https://reflowproject.eu/
[11] Reflow website: https://reflowproject.eu/
[12] Reflow on CORDIS: https://cordis.europa.eu/project/id/820937

- Cooperation to start with more 'basic' activities: sharing of social media posts, website material, etc. One idea would be to create a news piece on each project's website identifying the other 'two' projects and links to website/ social media.
- Onboarding of stakeholders/ target groups to project's forums/ communities of practice.
- Participation in sustainability activities of the Reflow project.

Following this meeting, the three partners began with the agreed 'basic' cooperation activities, namely the sharing of posts on social media. iPRODUCE retweeted contents related to Pop-Machina and Reflow (Figure 1, Figure 2), and the two projects also engaged in a similar manner (Figure 3, Figure 4).

Figure 1. Snapshot of iPRODUCE engaging with the Pop-Machina and Reflow projects on Twitter

Figure 2. Snapshot of iPRODUCE engaging with the Pop-Machina project on Twitter

Figure 3. Snapshot of Pop-Machina disseminating the iPRODUCE event on Twitter

Figure 4. Snapshot of Pop-Machina engaging with iPRODUCE on Twitter

In addition to social media, iPRODUCE also expanded the cooperation with Pop-Machina, having invited the project to be a speaker at the iPRODUCE event of 26 November 2020. Given some proximity in the projects' themes, iPRODUCE invited Pop-Machina to give a brief presentation of the project, its objectives, and activities, and particularly how the project is addressing social manufacturing from the circular economy and maker perspective.

The three projects also created a shared folder on an information sharing platform where the partners could upload different materials that can be used for cooperation activities.

2.3. Cooperation with other initiatives/ organisations

In addition to cooperation with projects, iPRODUCE has looked to engage with other relevant initiatives within the range of themes addressed by iPRODUCE.

European Factories of the Future Research Association (EFFRA)

EFFRA[13] is a non-for-profit, industry-driven association that promotes the development of new and innovative production technologies. It is the official representative of the private side in the 'Factories of the Future' public-private partnership. The main objective of EFFRA is to promote pre-competitive research on production technologies within the European Research Area by engaging in a public-private partnership with the European Union called 'Factories of the Future'. The partnership aims to bring together private and public resources to create an industry-led programme in research and innovation with the aim of launching market-oriented cross-border projects throughout the EU. These projects will develop demonstrators and models to be applied in different manufacturing sectors.

iPRODUCE is engaged with EFFRA through participation in the EFFRA Innovation Portal[14] (Figure 5), which provides an online platform for the sharing of information about research and innovation projects and associated project results and demonstrators in manufacturing.

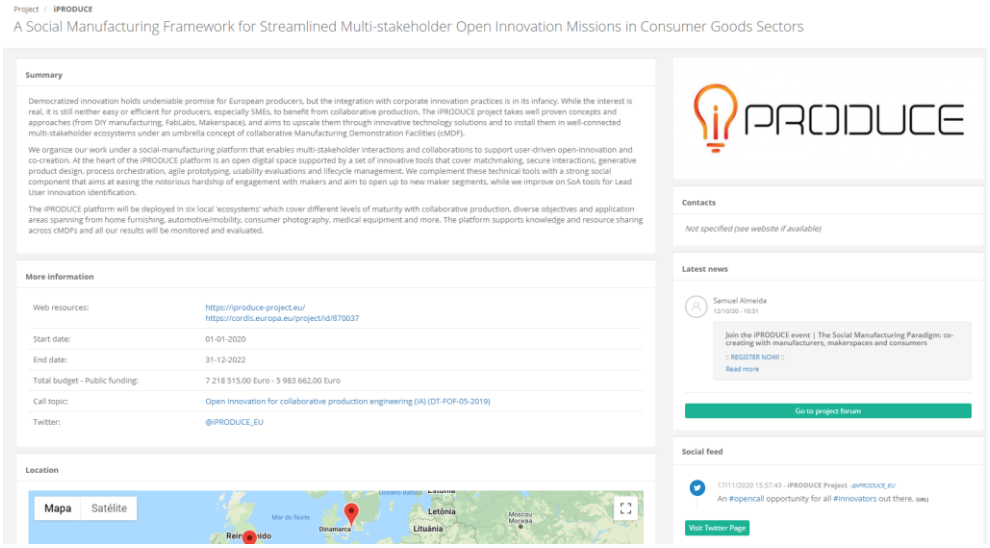

Figure 5. iPRODUCE page on the EFFRA Innovation Portal

In the case of the EFFRA Innovation Portal, cooperation is considered as the possibility to leverage the portal, its resources, and the presence of other manufacturing related projects to generate awareness about iPRODUCE, engage visiting stakeholders in the project and, ultimately, explore these advantages to engage with stakeholders in cooperation activities.

While concrete cooperation activities have not yet come to fruition, the portal has supported the visibility of the project, and been leveraged for dissemination purposes, including the dissemination of the iPRODUCE online event (Figure 6).

[13] EFFRA website: https://www.effra.eu/
[14] EFFRA Innovation Portal website: https://www.effra.eu/effra-innovation-portal

Figure 6. EFFRA's dissemination of the iPRODUCE event

Other engagement activities

In addition to the engagement with EFFRA, iPRODUCE has looked to explore some degree of cooperation with other initiatives/ projects, namely via social media, with the objective of increasing project visibility and disseminating specific activities.

This has been the case with, for example, the Advanced Manufacturing Support Centre (ADMA)[15], which was contacted to support iPRODUCE in the dissemination of the online event. This support was provided through dissemination of the event on the Twitter platform (Figure 7).

While ADMA works towards specific manufacturing-related objectives, iPRODUCE will further explore other cooperation activities between the two projects, mainly related to the engagement of ADMA's network of SMEs in iPRODUCE's project activities.

[15] ADMA website: http://www.adma.ec/

Figure 7. ADMA disseminating the iPRODUCE event on Twitter

Other similar contacts (e.g., support in the dissemination of iPRODUCE activities) were explored with initiatives/ projects such as FACTLOG[16] - Energy-aware Factory Analytics for Process Industries, I4MS[17] - ICT Innovation for Manufacturing SMEs, ENoLL[18] - European Network of Living Labs, and Sharework[19] - Safe and effective Human-Robot Cooperation towards a better competitiveness on current automation lack manufacturing processes.

No additional cooperation activities beyond social media engagement have been carried out but will be further analysed if an evident opportunity of benefit to iPRODUCE is identified.

[16] FACTLOG website: *https://www.factlog.eu/*
[17] I4MS website: *https://i4ms.eu/*
[18] ENoLL website: *https://www.openlivinglabs.eu/*
[19] Sharework website: *https://sharework-project.eu/*

Cooperation with other organisations

Siemens / TUM summer school

In September 2020, partner Siemens cooperated with Technical University Munich (TUM) to organize an on-site 5-day Summer School[20] dedicated to different aspects of Digital Twins (DT). The summer school was participated by 20 students, a number limited by COVID-19 situation.

Each day students participated in hands-on challenges, organised in small groups (each with 4 TUM students and representatives from Siemens). The Siemens department participating in iPRODUCE – UX Platforms & Prototypes – took this cooperation opportunity and presented Generative Design technology and its application in the project iPRODUCE. A special challenge was defined – "UX meets DT" – where students developed a smart product with parametric design, applying generative design techniques to one of the iPRODUCE use cases. After a comparative study, one design was instantiated and printed with two 3D printing technologies: fused deposition modelling (FDM) and stereolithography (SLA).

Figure 8. Presentation of iPRODUCE at the summer school

During this cooperation, TUM students have learned generative design with visual scripting, they have prepared an example of generated design for the furniture use case to be used within the iPRODUCE platform. Siemens, on the other hand, has evaluated the perspectives to educate visual scripting to persons not familiar with this paradigm, as it aims that more people could deliver transformation scripts for the Generative Design Platform. The process of co-design was also tested, when several "designers" created parts of a product separately in form of visual scripts and later assembled small scripts into one complex design, which will also be used in the tool. Examples of connecting a physical prototype to the generated design were developed, which can be interesting for makerspaces and fab labs, who can deliver such prototypes and attract further users to the co-design / co-creation process.

Siemens / Munich University of Applied Sciences / Strascheg Center of Entrepreneurship

In October 2020, Siemens started a 1-year cooperation with the Munich University of Applied Science and Strascheg Center of Entrepreneurship. As part of this cooperation, Siemens explained the main

[20] *https://ecosystem.siemens.com/siemenssummercamp*

objectives of the iPRODUCE project. Students involved reviewed the project's public deliverables, participated in public iPRODUCE events and are preparing a new kind of online training for maker relevant technologies, like 3D printing, electronics, AR/VR, laser cutting and others. The training will be designed in the form of an online escape game, that is expected to motivate gamers with different skills to communicate while learning new technologies. The students will practice their technical skills, acquire new ones, and will apply an entrepreneurship mindset to make online training attractive for different stakeholders. For example, this is particularly relevant for Siemens safety instructions, that are mandatory for Siemens maker spaces but currently quite ineffective.

During the current COVID-19 pandemic, people have noticed challenges and the necessity for effective remote collaboration. This shall also be considered in the online training with gamification. The students have already interviewed stakeholders, researched their needs, and proposed an initial concept for the online training, covering aspects such as participants' communication, their diversity, timing, different skills levels, gamers' onboarding, game design, and others. The focus of the first version will be on safety aspects of maker equipment. All versions will be first tested with Siemens maker spaces and Siemens employees. After the evaluation within Siemens, including economic assessments, this online training will be proposed for other iPRODUCE partners.

2.4. Cooperation via organisation/ participation in external events

iPRODUCE has also explored cooperation opportunities with individuals and organisations through the organisation of and participation in external events. Activities carried out in this regard are detailed in the sections below.

2.4.1. iPRODUCE organised events

iPRODUCE organised its first non-cMDF specific event on 26 November 2020. Under the title '**The Social Manufacturing Paradigm: co-creating with manufacturers, makerspaces and consumers**', the event aimed to highlight and promote a discussion regarding the role of makers and consumers in the social manufacturing landscape, which fosters - as has been made visible by iPRODUCE - the participation of individuals alongside the industry in the manufacturing of consumer goods.

The agenda (Figure 9) of the event was organised into four parts: (1) an introduction of the project and some of the results achieved, namely regarding survey results presented in deliverable D2.1 and the project's foundations for a social manufacturing framework (as addressed in deliverable D2.6); (2) two keynote speeches, one delivered by David Cuartielles and the other by César García; (3) a round of presentations from two projects iPRODUCE has engaged in collaboration with (as described in sections 2.1 and 2.2): Pop-Machina and OPENNEXT; and (4) a virtual round table, promoting a discussion on selected questions and those from the event participants.

Figure 9. Snapshot with overview and agenda of the iPRODUCE event

A total of 68 people participated in the event (from a total of 114 registrations). Most individuals came from the academia/research community (34 participants, 50%); start-ups/SMEs from other areas (6 participants; 8.82%); industry/ manufacturers and maker communities (both with 5 participants, 7.35%); and consumers (3 participants, 4.41%). 'Other areas' and non-respondents represent 8 participants (11.76%) and 7 participants (10.29%), respectively. It can also be highlighted that Spain (16 participants, 23.53%), Germany (14 participants, 20.59%) and Greece (12 participants, 17.65%) were the three most represented countries.

Each of the presentations delivered provided interesting insights regarding the social manufacturing framework or its related topics. For example, from the presentation on the social manufacturing paradigm, it can be highlighted that there are several main requests from maker spaces, namely digital fabrication tools, more agile methods, and increased manufacturing capabilities. Furthermore, in the social manufacturing landscape, there are barriers to consider, one being that open innovation approaches must carefully take into consideration the implications of intellectual property rights.

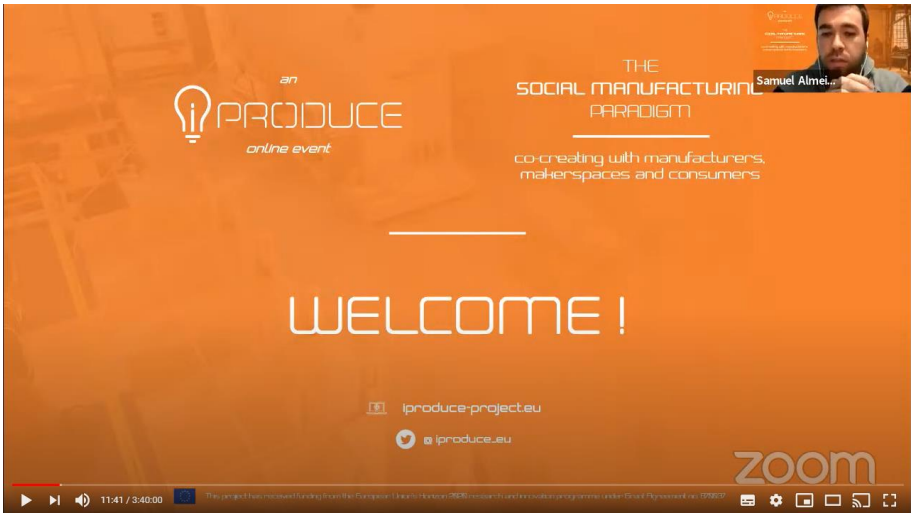

Figure 10. Screenshot from the iPRODUCE event, which was streamed live on YouTube

From the first keynote intervention (by David Cuartielles), it can be highlighted that, for example, governance is one of the most relevant elements to consider in establishing platforms, and that the sustainability of such a platform depends on the governance established. Any platform can be extended and adapted. However, when a *turning point* emerges, the model to be adopted and the objectives to pursue must be very well defined. In the second keynote (César García), it was emphasized that the act of creating and making is what drives people, being the presentation centred on this idea.

From the collaboration sessions, which gave stage to the Pop-Machina and OPENNEXT projects, the presentations mainly focused on presenting the project concept, activities, and impact, and some specific particularities of the maker-related activities of the projects. It can also be noted that these two projects are also addressing relevant concepts related to safety and standardisation, for example, which are of particular importance in iPRODUCE and can be a point for future cooperative discussions.

With the round table having to be adapted, the discussion focused on the key triggers to enable a successful social manufacturing framework. Some of the ideas that were shared by the panellists include the need to better know the paths required for projects and the turning points that need to be faced, as well as the key issues to be tackled along that path. The more established the paths (processes) are, the easier it will be to share them and have other people join. The existing uncertainty in many situations is still a barrier, even for makers. Another idea circulated was related to bridging the gap between stakeholders, namely existing institutions, those that do research and those that are 'on the ground' and on-site actively participating. By engaging in transparent conversations, using bottom-up approaches, it is easier to identify existing needs. Lastly, governance is a key aspect, both formal and informal governance issues. Having a clear governance structure is key to ensure trust and to engage stakeholders to participate.

Based on initial feedback collected via a post-event survey, the event was well received by the participants. From the standpoint of fostering cooperation, it is considered that the event was a valuable contribution. Not only did it allow for the project to engage with two prominent actors in the maker scene, which may provide additional valuable contributions to the project in the short to mid-term, but their participation in the event also attracted more external participation and interest in the project.

Regarding Pop-Machina and OPENNEXT, a similar rationale applies. While the cooperation activity was very much 'communication' focused, their involvement in the event increased awareness of iPRODUCE across the networks of the two projects. It also secured potential opportunities to participate in future activities organised by these projects, where iPRODUCE can also be presented in more detail among the projects' network of partners and stakeholders.

The recording of the event, which was streamed simultaneously, is available on the project's YouTube channel[21]. All presentations are available on the project website[22].

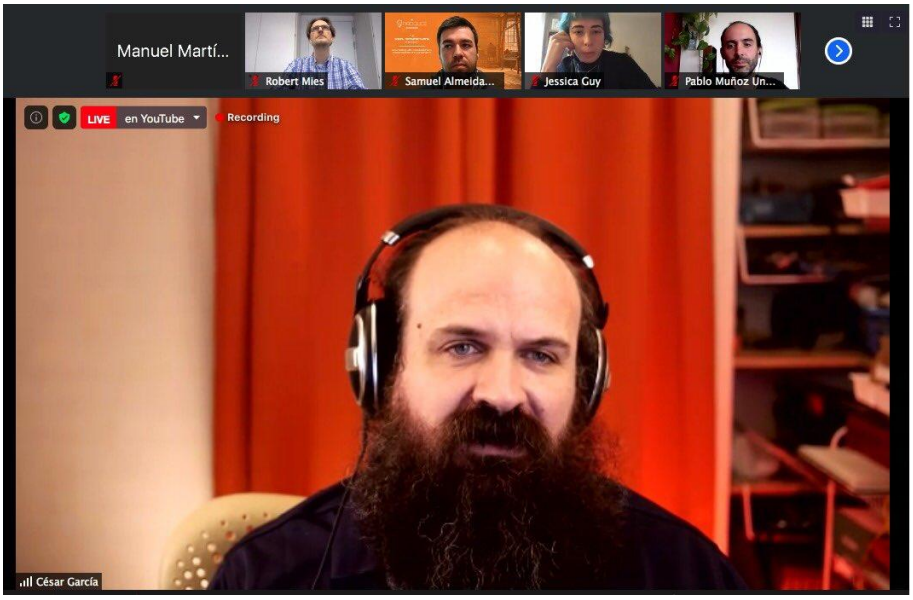

Figure 11. Screenshot from the iPRODUCE event (courtesy of Manuel Martinez Torán[23])

2.4.2. Participation in external events

During the period of January to December 2020, iPRODUCE explored opportunities to participate in events that focus on one or more of the various themes addressed in the project. While many manufacturing-related events were planned for this year, it is well known that the pandemic that has affected the world population since the beginning of the year forced many events to be moved online (shaping their nature and approach), be postponed indefinitely or even cancelled.

Nevertheless, iPRODUCE continued to explore event possibilities, namely those where it could have a specific intervention for promoting the project and for networking.

[21] iPRODUCE event video recording on YouTube: *https://www.youtube.com/watch?v=nKsgRyu1kdo&authuser=0*
[22] Presentations delivered at the iPRODUCE event:
https://iproduce-project.eu/agenda-the-social-manufacturing-paradigm-event/
[23] Image source: *https://twitter.com/mmtoran/status/1331957609004470278*

FABxLive 2020

iPRODUCE participated in the 2020 edition of FABxLive[24], which was implemented online. Primarily targeted to the FabLab and maker community, this year's edition was very much focused on the COVID-19 pandemic and the efforts that were made in combating the pandemic. The event took place from 27-30 July 2020 and hosted expert panels with a total of 38 keynote speakers during the live stream FAB SYMPOSIUMS.

iPRODUCE participated in the 'FabWorld' sessions of the event, which ran daily from 27-30 July. A three-minute video[25] was submitted that presented the project's context, its main objectives, the cMDFs, and the outputs and impacts. The video was streamed to the participating audience on 30 July and can be viewed[26] on the Fab Foundation YouTube channel (Figure 12, Figure 13).

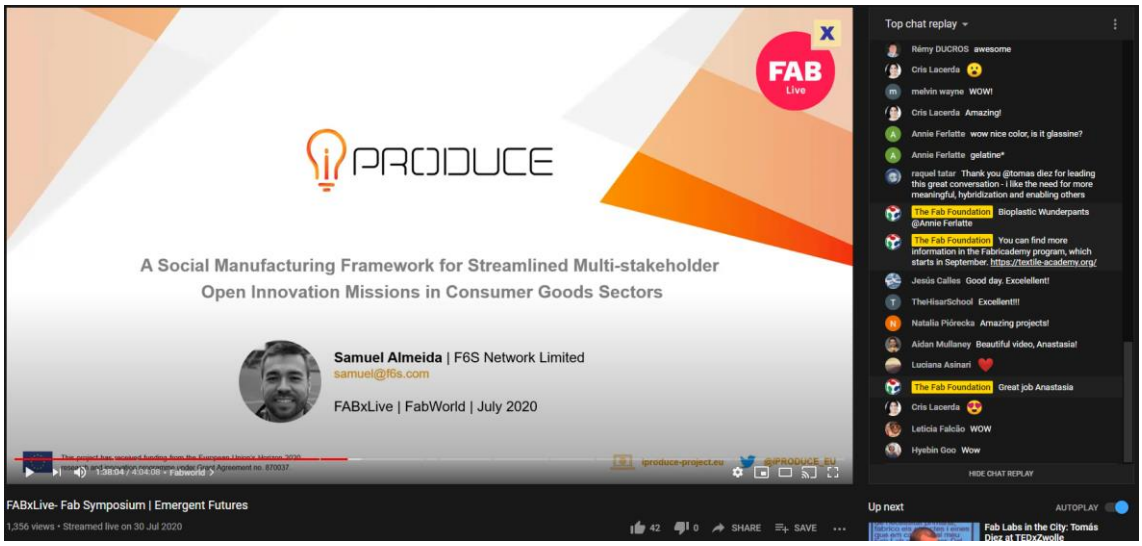

Figure 12. Screenshot from the streaming of the iPRODUCE presentation at FABxLive 2020 (1)

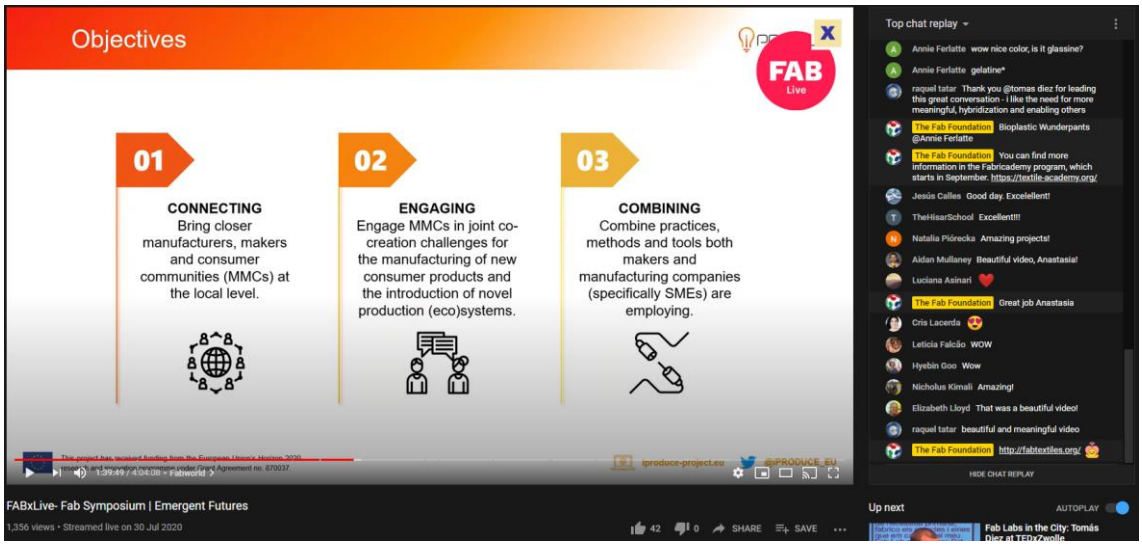

Figure 13. Screenshot from the streaming of the iPRODUCE presentation at FABxLive 2020 (2)

[24] FABxLive website: *https://fabxlive.fabevent.org/*
[25] iPRODUCE video for FABXLive/FabWorld: *https://www.youtube.com/watch?v=t-RDp9TIIUE*
[26] iPRODUCE video as streamed on the Fab Foundation's website: https://youtu.be/mGR_IcDo0gY?t=5867

When preparing the participation in the event, iPRODUCE was contacted by a representative[27] of the Fab Foundation, also representing Fabricademy, Textile[28] and Technology Academy, which showed interest in the project and further understanding what it is about. It was agreed in initial communications that a follow-up meeting would be scheduled to further discuss a possible cooperation.

A follow-up meeting was held on 28 October 2020 between iPRODUCE (represented by F6S) and the representative. The meeting focused on presenting iPRODUCE and its objectives, discussing the activities of the Fab Foundation, and the personal involvement in the Fabricademy, Textile and Technology Academy. The meeting also focused on how iPRODUCE could engage with the academy, which focuses on implementing a new approach towards the production and distribution of fashion elements by using distributed manufacturing infrastructures and knowledge networks.

It is possible that the social manufacturing framework being developed by iPRODUCE could eventually be tested also with Fab Textiles. This possibility is to be further explored in future meetings.

European Forum for Electronic Components and Systems (EFECS) 2020

iPRODUCE participated in the EFECS 2020 online event, which took place on 25-26 November 2020. Most of the engagement and networking opportunities were made possible through visits to virtual booths, which iPRODUCE also participated with (Figure 14).

Figure 14. iPRODUCE booth at the EFECS 2020 virtual event

Over the course of two days (with the morning of the 26 November 2020 coinciding with the iPRODUCE online event), the total number of visits to the iPRODUCE booth was five people. Despite engaging with the *visitors*, the interaction was minimal and did not result in any relevant contributions and benefits to the project.

From a general point of view, and although the idea of virtual booths can be appealing and a valid replacement for traditional booths, it is felt that the interest in engagement is far less than what would take place in a face-to-face format. For that reason, a similar participation in any future event, even for standard 'awareness raising' activities, will need to be carefully assessed.

[27] Representative preferred to be kept anonymous.
[28] Fab Textiles website: *https://fabtextiles.org/*

3. Cooperation and engagement activities within cMDF

In the first 12 months of the project, the partners of several iPRODUCE cMDFs have been active in engaging with stakeholders and pursuing potential cooperation opportunities to bring stakeholders into the project or make them aware/ active in the cMDF activities.

The sections below highlight the cooperation and engagement activities within the German, Danish, Spanish, and Greek cMDFs.

3.1. German cMDF

The German cMDF comprises Fraunhofer FIT (a research institution) MakerSpace Bonn (a makerspace facility) and ZENIT (a public private partnership organization in Germany that consults SME).

To foster cooperation and activities within the German cMDF region, a workshop series was established to present innovation methods, digitalization possibilities and manufacturing capabilities of the MakerSpace Bonn, but also the maker movement in general. The target audience consists of consumers, R&D institutions, and mainly SMEs from the German region. Initial engagement and contacts to makerspaces and stakeholders were made on a face-to-face basis.

3.1.1. Workshop series

Audience and contact

As ZENIT is the innovation agency of the German state of North Rhine-Westphalia, a preselected number of SMEs was targeted with invitations to the workshop series. For each event, approximately 1000 contacts (SMEs, R&D institutions, makerspaces, FabLabs) in the ZENIT network were invited to the workshops via a mailing list. In addition, Fraunhofer FIT advertised the workshop among their Fraunhofer network of research facilities.

Considering the current pandemic and the limitations it has imposed, the workshop series was designed in an online format using the Zoom video conferencing tool. A standard agenda was defined for the different workshops, each running for approximately 90 minutes and included three agenda items:

- Brief introduction of participants
- Presentation or interactive training by the cMDF with varying topics
- Feedback round (Q&A)

Depending on the specific topic of each workshop, different collaboration tools were used, such as Mural and TinkerCAD.

Workshop topics and dates

In 2020, the German cMDF organised and implemented five workshops (Table 2). These workshops, which were held on an (almost) monthly basis, addressed different topics, and registered a different number of participants, which varied according to the workshop. Workshops addressing digitisation registered the highest number of participants (e.g., COVID 19 related home office and digitization challenges).

Table 2. Overview of the German cMDFs implemented in 2020

Date	Topic	Participants registered
21 April 2020	Methods and digital tools from the maker community	20
19 May 2020	Advantages and disadvantages of collaborative online tools	40
16 June 2020	Maker vs. virus – rapid-innovation; production and distribution and funding opportunities	10
18 August 2020	Design thinking to foster innovation and interactive product design	12
28 October 2020	X-mas special: 3D-printing for giveaways	5
January 2021 *(Final date TBD)*	IoT development for innovative products	---

As a result of the workshops, one of the participating SME established a follow-up project together with MakerSpace Bonn for the 3D printing of prototype products to be used in trade fairs or customer visits.

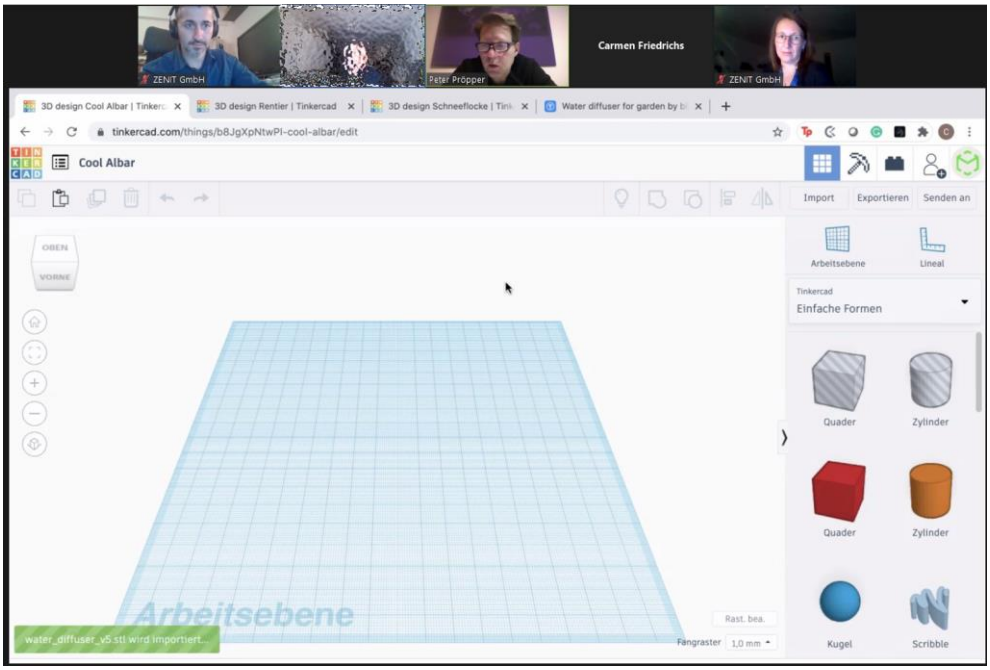

Figure 15. Screenshot from the 5th German cMDF workshop

3.1.2. Cooperation events/ face-to-face meetings (video calls)

Due to national limitations deriving from COVID-19, all face-to-face meetings were carried out using video conferencing tools. The German cMDF contacted two makerspaces and one research institution, which is interested in the connection and possibilities between makerspaces and SMEs (Table 3).

Table 3. Summary of contacts made by the German cMDF

Contact	Meeting outputs
3D Druckzentrum Ruhr (Peter Petersen, CEO)	• Discussion on potential complementary actions and synergies. • Follow up scheduled for 2021.
FabLab Kamp-Lintfort (Martin Kreymann, Manager)	• Expert interview on best practices.
University of Wuppertal (Tobias Held, researcher)	• Expert interview on synergies and experiences within the iPRODUCE project. • Research on the impact of makerspaces to SME and society.
CCMS (co-creation labs and maker spaces) initiative; kick-off event on 20 October 2020	• Initiative of the Fraunhofer Society to connect its various FabLab institutions. • Participation in kick-off event in October. • About 20 participants from different Fraunhofer fab labs and makerspaces. • Exploitation of possible partners for iPRODUCE.
Dezentrale (Patrik Januschowitz; FabLab in Dortmund, Germany, attached to Fraunhofer UMSICHT Institute)	• Discussion about experiences in collaborating with SMEs and start-ups. • Resource management tool for makerspaces would be a highly requested tool. • Information about EU project VULA (until 2019; *https://vulca.eu/*: Explore Europe and the Maker/ Hacker Movement)

3.1.3. Future engagement and cooperation activities

In the upcoming months, the German cMDF will continue implementing its workshop series. A greater focus will be put on collaboration opportunities between SMEs and the German cMDF. While the COVID-19 pandemic continues, the workshop series shall be modified towards a hybrid format, including physical participation at MakerSpace Bonn and the use of video simultaneously.

Regarding workshop topics, it is expected that some of the more successful topics will be repeated (e.g., collaborative online tools; design thinking), possibly involving entities that did not participate previously. To further expand on cooperation with these stakeholders, the SME participants of the workshop series will be contacted after the workshops to further discuss cooperation with the cMDF.

Additionally, follow-up activities with the contacts highlighted in Table 3 will be pursued:

- Follow up and further discussion of collaboration opportunities with 3D Druckzentrum Ruhr since both institutions (3D Druckzentrum Ruhr and MakerSpace Bonn) are dealing with complementary expertise (manufacturing *vs.* art & creativity).
- CCMS (co-creation labs and makerspaces) initiative: Fraunhofer FIT will follow up with the community and explore further events and promote knowledge exchange with participants.

- Expert interview/ follow up with the manager of Dezentrale (FabLab in Dortmund): explore synergies and collaboration opportunities (e.g., outcomes from the EU project VULCA[29], which explores Europe and the maker/ hacker movement.
- Follow up with University of Wuppertal researcher (research on "requirements for Fab Labs/Makerspaces become a local institution for innovation and knowledge transfer for various stakeholders").

3.2. Danish cMDF

The Danish cMDF, consisting of partners Copenhagen Business School (CBS) and betaFACTORY, has carried out several engagement and cooperation activities with local Danish stakeholders.

The objective of the Danish cMDF is to deploy the Mobile betaFACTORY Unit in real case use scenarios in at least 10 Danish cities to evaluate the requirements for a sustainable long-lasting business case. The results of these activities will provide an understanding of how to best scale up the open innovation concept, to understand the consumer market, to better cater to actual stakeholder needs, as well as to understand how future trends impact the concept. This objective is to be achieved through the deployment of three specific use cases (UC):

- (UC1) Co-creation in schools: digital fabrication as a low-entry method for making hands-on interior productions and urban space interventions
- (UC2) Distributed Design Market: customized bespoke furniture
- (UC3) Temporary Architecture: Build urban temporary built environment

The Danish cMDF has engaged and cooperated with its stakeholders in five public events that were carried out starting in the summer:

- Danish cMDF kick-off event
- School co-creation workshop
- Women makers workshop
- 2nd school co-creation workshop
- 2nd Women makers workshop

Contacts with these different stakeholders were done through various approaches. For the schools, contact was made through information available at the Ministry of Education, where the Danish cMDF collected a list of schools around the country and sent emails inviting them. For the participants in the kick-off event, invites were sent to all the existing contacts from betaFACTORY network and to a range of possible interest SMEs and universities through a representative of CBS' network. For the women makers workshop, the local network was used, and for the 2nd school co-creation workshop, the initial list of participants from the first workshop was used, as well as direct contacts from the initial attendees.

It is relevant to note that the events implemented to date also addressed one or more of the use cases. A summary of the objectives and achievement of the events[30] is detailed in what follows.

[29] *https://vulca.eu/*
[30] Due to COVID-19, the number of people who could attend all events was limited.

3.2.1. Danish cMDF kick-off event

The Danish cMDF kick-off event took place on 27 August 2020 and addressed use cases UC2 and UC3. The objective of the event was to create awareness about the project and explore partnership services with potential consumers, as well as to increase makerspace attendance.

A total of 15 individuals participated in the event, representing consulting, higher education, architecture, and the financial industries. In the event, the participants were introduced to the project, were able to explore the betaFACTORY facilities (Figure 16) and engaged in discussion about opportunities for future collaborations and partnerships.

Figure 16. Participants visiting betaFACTORY facilities at the kick-off event

Key outcomes of this event focusing on cooperation and partnerships include the availability of an open and in-development workspace, the opportunity for stakeholders to build 1:1 scale prototypes, and the opportunity to offer unique services to other private companies. One of the participants also requested a 'hands-on' workshop where people could in fact *make* something.

3.2.2. School co-creation workshop

The School co-creation workshop also took place on 27 August 2020, back-to-back with the kick-off event, and addressed use case UC1. The objective of the event was to generate awareness about the project and explore partnerships and product development opportunities with the schools towards the achievement of use case UC1.

With the participation of two schools, the iPRODUCE partners introduce the participants to the project and the betaFACTORY space as well as cooperation potential for the schools to use the betaFACTORY mobile unit. Furthermore, the workshop explored the adaptation of the traditional business model canvas into a project value canvas (PVC) to understand how to best address and collaborate with schools.

Figure 17. Participants in the cMDF co-creation workshop

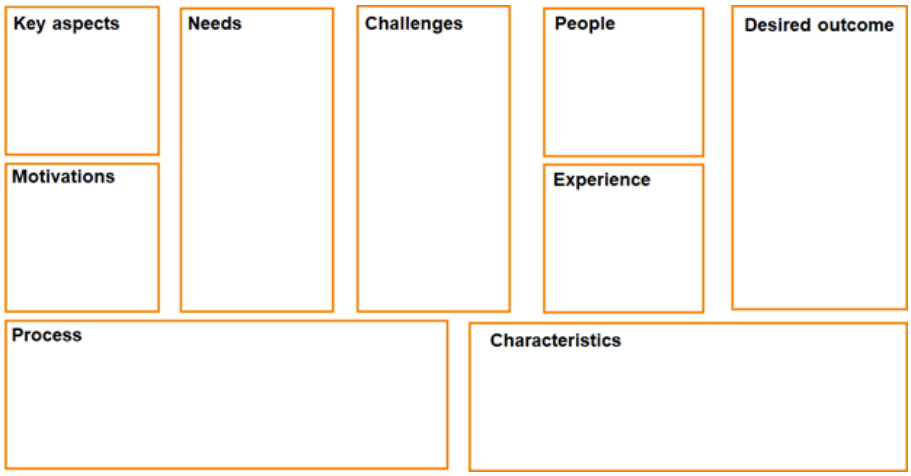

Figure 18. Structure of the project value campus used for discussion

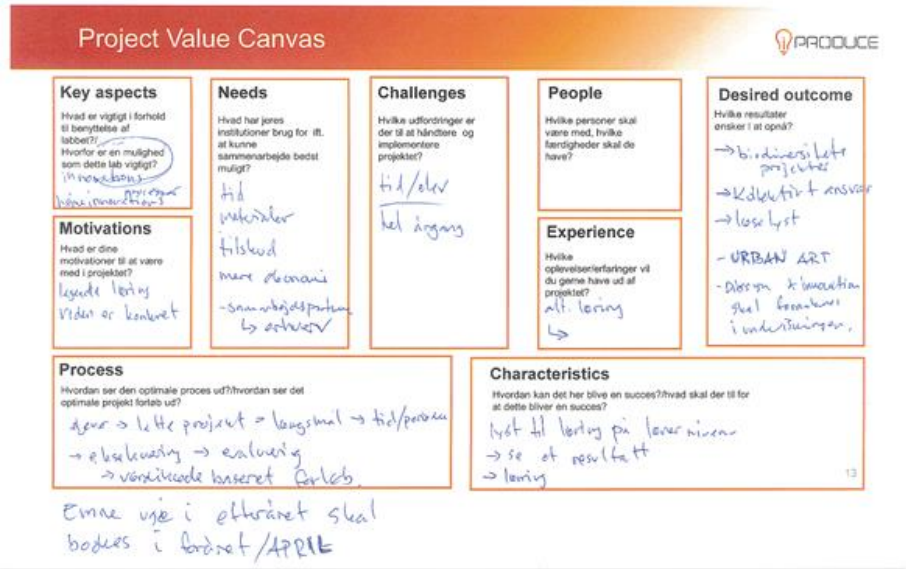

Figure 19. Example of the development/ result of a project value canvas

Figure 20. Review of the main findings from the school co-creation workshop

Follow-up activities were agreed at the end of the workshop, which included for the schools to better analyse and come back to the Danish cMDF partners with their specific needs and a timeline for implementation. The betaFACTORY also committed to organizing a follow-up workshop to help define the process for use case UC1.

3.2.3. Women makers workshop

The third event was the Women Makers Workshop, which took place on 7 October 2020, and addressed use cases UC2 and UC3. The objective of this workshop was to generate awareness about iPRODUCE, explore potential partnerships, services and product development opportunities and interests with women makers (prosumers).

Participated by 14 attendees, the workshop – like the previous events – provided participants with an introduction to the project, included a visit to the betaFACTORY space and fostered discussion about opportunities for future collaborations and partnerships.

Figure 21. Participants of the Women Makers Workshop

Key outcomes of this event, which focused on cooperation and the promotion of inclusion, included discussion points related to having a set of open courses as a way of bringing different groups to the space; implementing selective pricing to help the initial start-up setup; the possibility of being part of a network which would generate opportunities and inspiration; the access to a support network database that can help accelerate production; and the access to cheap or free materials for the development of prototypes.

3.2.4. 2nd co-creation workshop

The fourth Danish cMDF event was the 2nd school co-creation workshop. This event took place on 22 October 2020 and was a follow-up to the first school-focused workshop. It allowed the cMDF to better define the activities and the timeline for the implementation of the use case, represented in Figure 22.

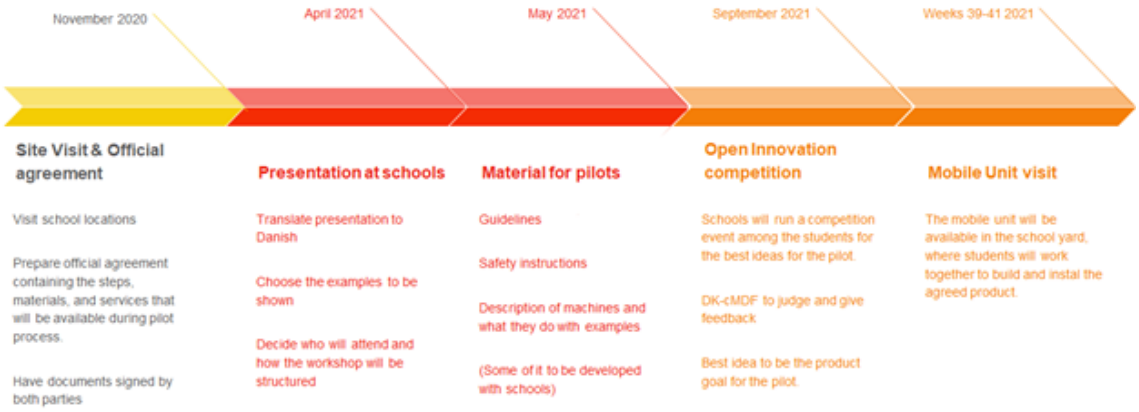

Figure 22. Timeline for implementation of the discussed use case

3.2.5. 2nd Women Makers Workshop

On 29 November 2020, the Danish cMDF held its second women maker workshop. This full day event was dedicated to presenting iPRODUCE and allowing participants to get *hands on* with digital fabrication and experimentation, amplifying the understanding about making and related tools. Most importantly, it allowed betaFACTORY to reach out to establish a collaborative interdisciplinary and diverse maker network.

During the event, a total of 16 participants were introduced to the capabilities and qualities of the various machines available at betaFACTORY, and learned about other technologies, such as digital prototyping hardware tools. The participants' background varied greatly, ranging from finance, science, photography, design, and architecture, among others.

Approximately a third of the participants were first time attendees, while for others it was their second meeting. This shows a clear interest in forming an active community that can function as one of the stakeholder groups helping develop the future iPRODUCE ambassadors' programme.

3.2.6. Established cooperation activities

Through the workshops and project communication activities already carried out, the Danish cMDF has already established several cooperation activities that it will build on in the coming months of the project. These activities involve different types of stakeholders and entities and address different use cases, securing the upcoming deployment of the mobile unit and presenting future business opportunities.

- Schools: Ådales School, Frederikssund; Duevej School, Frederiksberg (UC1)
- Museums: Technical Museum of Denmark, Elsinore (UC3)
- Universities: Southern Danish University (SDU, department of Technology & Innovation), Odense (UC1)
- Companies: KHR (architecture), Copenhagen; Elsinore Municipality, Elsinore (UC2)

3.3. Spanish cMDF

The Spanish cMDF consists of AIDIMME, LAGRAMA (a manufacturer) and Oceano Naranja | VLC FabLab (a FabLab). The objective of the Spanish pilot is to enable collaborative engineering between the furniture manufacturing companies, the manufacturing demonstration facility (hosted by AIDIMME)

and the FabLab, jointly with the community of experts/makers, allowing them to develop customer-driven products with complex specifications that the furniture producer cannot tackle by themselves.

3.3.1. Meeting with Spanish makerspaces

On 26 June 2020, FabLab Oceano Naranja organised a meeting with six Spanish maker spaces. The objective of the meeting was to discuss experiences and practices with experts in the domain of digital manufacturing, information which was also used to prepare the contents of iPRODUCE deliverable D2.3 - Benchmarking Report on Makers Approaches and Tools for collaborative production engineering. The participants were also engaged to share their thoughts about the 'before' and 'after' COVID-19: the challenges they face, the future they are facing, their expectations, future needs, and any exposure received due to their contributions in the *fight* against COVID (i.e., by creating face masks, shields, etc.).

This meeting proved to be important to engage with different makerspaces from across Spain, to present iPRODUCE to them, and to set foundations for cooperation in the future by their participation in a wider Spanish cMDF.

The meeting was attended by AIDIMME and several makerspaces: FabLab León, FabLab Sevilla (University of Seville), FabLab Cuenca, Xtreme (Almendralejo), Makespace Madrid, Fab the Fab.

Figure 23. Participants in meeting with Spanish makerspaces

3.3.2. Participation in online event: "Create in the classroom, the importance of the University FabLabs"

On 24 September 2020, a representative of FabLab VLC participated in an online conference[31] titled "Create in the classroom, the importance of the University FabLabs" (*original title: "Crear en el aula, la importancia de los FabLabs Universitarios"*), organized by the General Foundation of the University of Leon and Companies (FGLUM).

The online conference focused on specialised training, the relationships between the university and the corporate world, and the scientific and technical research of the University of León (Spain). Other participants in the event included the University of Deusto, CEU San Pablo of Madrid, University Polytechnic of Cartagena and the University Polytechnic of Valencia. One of the key topics of the conference was to discuss the participation of makerspaces and FabLabs in European Universities,

[31] Video recording of the conference: *https://youtu.be/ZQO2CKqdQHM?t=4044*

taking into consideration some of the main findings from the benchmarking study that fed deliverable D2.3 of iPRODUCE.

Figure 24. Participants in the "Create in the classroom, the importance of the University FabLabs" event

3.3.3. HABITÁT Congress

iPRODUCE was present at the HABITAT Congress 2020, organised by and represented at the event by partner AIDIMME, which took place on 22 October 2020. The HABITAT Congress is one of the most important meetings about strategies in the home furnishing sector in Spain. It is targeted at managers and professionals of companies within the sector, such as furniture, lighting fixtures, bathroom and kitchen equipment, carpentry, installation, interior designers, etc. and other institutions.

The event was an opportunity for iPRODUCE to be presented among the aforementioned network of stakeholders, which was supported by a promotional video[32] of the Spanish cMDF that was displayed in the venue's main hall (Figure 25).

Figure 25. Participation of iPRODUCE at the HABITÁT Congress with a video of the Spanish cMDF

Participation in the event and the showing of the video allowed for some interesting discussions with the event participants, mainly focussing on what iPRODUCE was doing and what it aimed to achieve.

[32] Spanish cMDF promotional video presented at the HÁBITAT congress: https://www.youtube.com/watch?v=Hdb1m6kqUV0

At this stage, while stakeholders (namely industrial companies) are interested in the project, they are more interested in seeing and exploring the platform, and how they can themselves use it. Follow-up and more concrete cooperation activities are to be resumed once more specific results can be shared.

3.3.4. Participation in online event: "Makerspaces: digital manufacturing, motivation and learning"

On 27 November 2020, Manuel Martínez Torán (representative of FabLab VLC) participated in an online multiplier event organised within the framework of the Make in Class[33] Erasmus+ project (Figure 26).

In this event, iPRODUCE was presented[34] from the perspective of the social manufacturing concept that is being proposed within the project. Furthermore, it was an opportunity to present relevant findings from the benchmarking study carried out for deliverable D2.3, which also addressed the relationship of European makerspaces with educational entities, the social component of the makerspaces, and the typology of projects dealing with these topics. The event was also participated by Makespace Madrid, FabLab León and Fablab Munich.

Figure 26. Flyer of the "Makerspaces: digital manufacturing, motivation and learning" event with iPRODUCE participation

For this event and the event described in section 3.3.2, it should be highlighted that one of the benefits of participating was to generate awareness about the project in view of initiating discussions on future cooperation with the participants.

[33] Make In Class Erasmus+ project website: *http://www.makeinclass.eu/*
[34] Video recording of the event: *https://youtu.be/AjTRNeNswFo?t=3661*

3.4. Greek cMDF

The Greek cMDF consists of partner AidPlex and associate partner OK!Thess, with collaboration of partner CERTH/ITI. The objective of this pilot is to leverage expert opinions and experiential feedback to feed the design process supported by community makers and develop innovative medical equipment that outperforms current solutions in terms of comfort and efficiency offering patients a chance to increase their quality of life.

With the Greek cMDF focusing on the medical sector, many of the engagement and cooperation activities have targeted stakeholders in that sector. A review of these activities is presented below:

- Meetings with orthopaedic key opinion leaders for feedback on medical prototypes and their commercial exploitation. Some of the contacts include:
    - Dr. Kapetanos | Emeritus Prof. of Orthopedics at AUTH
    - Dr. Samoladas | Lecturer at AUTH
    - Dr. Spyrou | Director of the Rehabilitation Unit of the Polyclinic of the Olympic Village
    - Dr. Sakellariou | MD, MSc, PhD
    - Dr. Topalis | MD, MSc
    - Dr. Costouros | Stanford Medicine Outpatient Center Orthopedic Surgery
    - Dr. Panteliadis | Consultant spinal surgeon at Guy's and St Thomas' Hospital
- AidPlex led the COVID-19 Response Greece initiative and designed protective face shield substitutes that can be manufactured *en-masse*. More than 50.000 face shields have been shipped all over Greece. Additional information in section 4.1.
- AidPlex held meetings with Asteriskos and Patras Science Park (Patras Based Fablabs) to examine how other fablabs achieve efficacy with other makers.
- AidPlex held meetings with Elekronio[35] (a Bicycle maker in Thessaloniki) to help them with the development of 3D printed parts of their bicycles.
- AidPlex had meetings with Super Relief[36] to support them with the design thinking on how they can make their products more “kid friendly”. It is considered that this initial engagement is a strong possibility for cooperation in the upcoming months.
- CERTH/ITI signed a memorandum of understanding with the Digital Manufacturing and Materials Characterization Laboratory of the International Hellenic University[37].
- CERTH/ITI opened its additive manufacturing facilities for social manufacturing:
    - MultiJet Printing and Selective Laser Sintering used to fabricate intermediate carriers for protein electrophoresis. CERTH/ITI also engaged in a co-creation activity with HELLABIO[38], a Greek company based in Thessaloniki.
    - Co-creative activities and synergies with a Medical clinic, TheMIS ΕΠΕ[39] (Greek company with headquarters at Thessaloniki), for the design of 3D printed implants for orthopaedics using bio-printing.

[35] *https://elektroniowheels.gr/el/*
[36] *https://www.superrelief.gr/*
[37] *www.ihu.gr/ucips/digital-manufacturing-and-materials-characterization-laboratory-dmmc-lab*
[38] *www.hellabio.com*

- CERTH/ITI open its additive manufacturing facilities to establish social manufacturing synergies with the Greek companies ANiMA - The 3D Printer Expert[40] and Lino3D[41].
- CERTH collaborated with the International Hellenic University and the Greek companies ANiMA - The 3D Printer Experts, TheS3D, Quick3DParts and Retouch-Health Solutions to provide support to the Greek health system in the fight against the COVID-19 pandemic crisis, having developed 650 protective 3D printed face masks.
- CERTH/ITI, following a social manufacturing paradigm, has supported the Institute of Applied Biosciences[42] of CERTH by manufacturing robust 3D printed face shields for the personnel who carry out COVID-19 rapid tests to CERTH's staff.

[39] *www.the-mis.gr/site/en/*
[40] *www.anima.gr*
[41] *https://lino3d.com*
[42] *www.inab.certh.gr*

4. iPRODUCE partners' cooperation against COVID-19

While somewhat and admittedly out of scope from the main objective of this document, it is nevertheless considered highly relevant to detail other cooperation activities that some of the iPRODUCE partners have carried out over the past 12 months: cooperation in the *fight* against COVID-19.

The iPRODUCE consortium consists of several partners that are well known in the do-it-yourself (DIY), fablab, and maker communities, to name a few. These partners have knowledge, facilities, and technologies that are highly valuable in this regard. The health situation that affected the world during 2020 has led many partners to adapt and rise to the occasion, to connect and cooperate, and deliver solutions in the fight against COVID-19. The following sections highlight the efforts of three iPRODUCE partners.

4.1. AidPlex

AidPlex is an active member of Greek volunteer action **COVID-19 Response Greece**[43], and has worked and contributed towards the development of protective gear. This included, for example, the development and mass production of two types of protective face shields (Figure 27). In late March 2020, the volunteer action distributed more than 3,000 face shields to the Thessaloniki Medical Association and another 1,200 were ready to be delivered to Greek Medical Associations and Hospitals that are engaged with the volunteer action.

Figure 27. Partner AidPlex and example of face shield developed

In early April, the number of face shields developed and distributed was more than 15,000, a result of the hard work of the COVID-19 Response Greece volunteers. After three weeks of intense efforts, more than 30,000 face shields had made their way across multiple Greek cities and to more than 70 groups from different medical associations, hospitals, and others (Figure 28).

[43] COVID-19 Response Greece: *https://www.covid19response.gr/index.html*

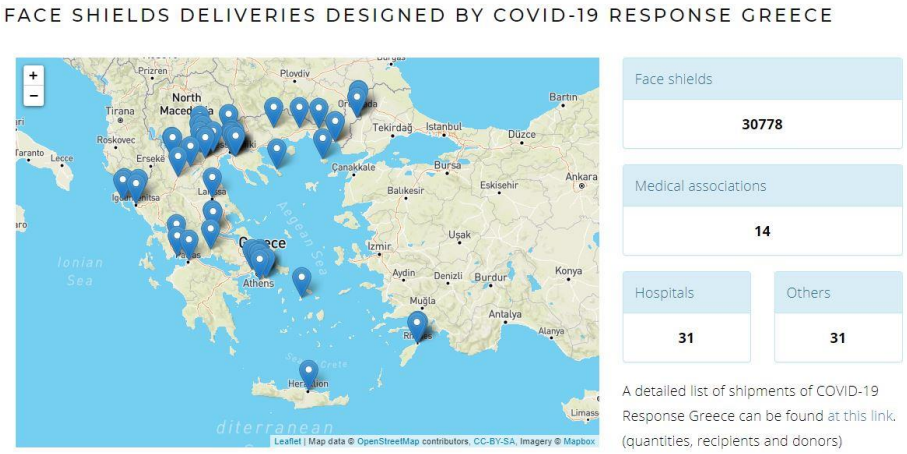

Figure 28. Overview of the distribution of face shields across Greece by the COVID-19 Response Greece initiative

The face shield is one of several projects being run by the COVID-19 Response Greece action. This project aims to make the design of protective gear open source and available to everyone that has relevant production facilities, under the license terms of Creative Commons (4.0 International License) Attribution-Non-Commercial. More information[44] on the face shield project, coordinated by Dimitrios Moustakas from iPRODUCE partner AidPlex, can be found on the initiative's website.

4.2. Makerspace Bonn

MakerSpace Bonn established a dynamic COVID-19 task force, which delivered solutions according to different needs identified. When the task force identified that 3D-printed valves and adapters were crucial to save lives, they focused on developing those materials. They also identified a shortage of ventilators, crucial to support hospitalised patients, and therefore cooperated with doctors in the design of ventilators. They contributed to the development of an improved concept for the design and production of valves for ventilators, which was required during the peak and post-COVID-19 period (Figure 29).

Figure 29. Partner Makerspace Bonn and example of face shield developed

[44] *https://www.covid19response.gr/project1_en.html*

Their efforts also turned to the development of face masks and shields (Figure 29). Having contributed to the production of more than 5,000 masks, many of these have been donated to the homeless, those with low incomes, and refugees. Furthermore, the Makerspace Bonn task force also contributed with more than 1,000 3D-printed face shields. Having partnered and cooperated with Bosch, the output increased to approximately 10,000 face shields.

4.3. Materalia

The third partner to highlight is Materalia, a French competitiveness cluster that continued to work during their national COVID-19 lock-down. During that period, and in an adapted fashion, they were committed to provide their members with support and long-term solutions for their specific needs. Materalia's team was able to implement actions focused on three strategic approaches:

1. **Being a reliable source of information**: Materalia established a platform for gathering information on contributions, equipment needs, and business support procedures aimed at providing cluster members with the information they need to restart or anticipate the recovery of their business. Members were kept informed through regular newsletters, providing information on calls for proposals which emerged during the COVID crisis, and keeping the cluster members updated on the latest targeted news concerning COVID-19.

2. **Providing support to members**: Materalia published articles on their website and social media platforms highlighting the solidarity and innovative actions set up by cluster members to cope with COVID-19. They also organised a series of webinars, such as "Best practices in order to go back to business", which aimed to help prepare cluster members for the restart. Furthermore, a COVID-19 KIT was created, which contains useful information for members, particularly targeting the industry.

3. **Fostering a reflection on the future**: More than a simple follow-up, Materalia acknowledged the importance of accompanying its cluster members in the pursuit of their activity. To anticipate members' needs as accurately as possible, Materalia set up a survey to understand the difficulties of companies and thus be able to propose solutions in the future.

5. Final considerations

This deliverable is D10.4 – Report on cooperation activities of the iPRODUCE project, funded by the European Union's Horizon 2020 programme. The objective of this deliverable has been to provide a review and analysis of the different cooperation activities carried out within the iPRODUCE project over the course of its first year of activities: January 2020 (M1) to December 2020 (M12). This is the first of three deliverables that report on cooperation activities, the latter two to be delivered at M28 and M36.

The engagement and cooperation activities reported were presented through two perspectives: (1) cooperation between iPRODUCE and other external projects, initiatives and/or activities, and (2) cooperation involving specific iPRODUCE partners and stakeholders.

In either case, iPRODUCE has aimed to explore and engage with different stakeholders and initiatives in pursuit of establishing synergies and cooperation opportunities. These efforts have proven to be, in the most part, successful and of value to the project. Not only has iPRODUCE established a stronger presence amongst several of the project's main stakeholder groups (though interactions carried out by cMDFs), but it has also initiated collaborative activities that will continue and expand in the following years. Furthermore, by engaging with external projects/ initiatives, iPRODUCE is also increasing its visibility among the networks of those projects/ initiatives, which in the short to medium-term can also be of benefit to the project.

The different cooperation activities presented are at different maturity levels due to the particularities of each activity, but also other variables not under the control of the project. On the one hand, the fact that the projects iPRODUCE engaged with are further ahead in their timeline, with iPRODUCE still being in a *conceptual* stage the larger part of 2020, has limited the cooperation to mostly 'awareness raising' activities. Furthermore, some stakeholders are still looking for more concrete results before being able to actively cooperate, and these results are mainly expected to emerge in the second year of the project.

Yet, on the other hand, it cannot be denied that the global pandemic that has reached the four corners of the world has also negatively affected the extent to which the project has engaged with local stakeholders. In a project where social, face-to-face, and hands-on interactions are expected to be very prominent, the limitations imposed at a national level have been a challenge for these activities that digital tools cannot fully replace.

As mentioned above, this is a *living* document, the first of three reports of a similar nature, that will be updated with the results of cooperation activities carried out over the next 16 months, up until M28. With iPRODUCE transitioning from a conceptual framework to more practical and hands-on activities, where concrete results will emerge in the forthcoming months and where stakeholders will be increasingly engaged at the local (cMDF) to the project-wide level, more opportunities for cooperation are expected to emerge. Moreover, with the tide – hopefully – turning in the coming months, it is expected that planned activities be carried out as foreseen and that new and impactful cooperation activities emerge.

PRODUCE

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