D6.6. Open Competitions on Consumer Products Innovation Challenges

June 2023

Prepared by **F6S**

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Abstract	The deliverable provides an overall review of the two open competitions and the Hackathon activities carried out within iPRODUCE from May 2021 to April 2023.

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Executive Summary

This deliverable is "*D6.6 - Open Competitions on Consumer Products Innovation Challenges",* of the iPRODUCE project funded by the European Union's H2020 research and innovation programme.

The objective of this deliverable is to provide an overall review of the two open competitions and the Hackathon activities carried out within iPRODUCE from May 2021 to April 2023.

The document has been structured to provide a summary of each of these activities.

Open Competition #1 - Solutions and services for the prosumer competition.

The competition aimed to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of co-design and co-development.

Participants were invited to submit their entries in the form of ideas for products, services or similar – to one or more of the proposed competition challenges. A total of 13 proposals were launched on the F6S platform, which was used to receive and manage submissions. Of these, only four were formally submitted to the competition.

The competition welcomed all ideas to the proposed challenges, particularly those in a concept phase or early-stage prototyping and looking for design and functionality improvements. The competition was able to support winners in the collaborative design and development of new and early-stage solutions to any of the proposed themes, helping these reach further stages of prototype development and implementation.

Open Competition #2 - Open and collaborative innovation competition

The objective of the competition was to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of open and collaborative innovation.

Participants were invited to submit their entries to one of the specific competitions organised within the project's cMDFs. A total of 44 proposals were received and managed by the cMDF partners with 11 submissions awarded for Open Competition #2.

The competition welcomed ideas and solutions that addressed the challenges and topics defined for the specific cMDF competition, which may have been at different stages of development. The competition aims to support the development of submitted ideas and solutions (e.g. project/ product) in an open and collaborative way by providing the applicants with the tools and support to materialise them.

As part of the submission process, participants were required to describe the idea or solution they are submitting to the competition, the expected impact, and motivation to develop and implement their idea or solution. Other information specific to each cMDF competition was also applicable.

Awarded participants were given visibility of their ideas or solutions and, depending on the maturity of the solutions, marketing and commercialisation support was provided (e.g., matchmaking services, funding opportunities).

Open Competition #3 - iPRODUCE Hackathon

The iPRODUCE hackathon was an intensive 3-day hybrid event held locally at each cMDF location as well as fully online. Participants were able to join individually or in teams of up to 3 people to explore the iPRODUCE OpIS platform to unleash their creative potential to develop a product idea. One individual or team was awarded at each cMDF location (5) as well as participants participating online, with a total of 6 winners at the end of the Hackathon.

The main objective of the iPRODUCE hackathon was to contribute to the validation of the iPRODUCE value proposition, particularly the OpIS platform and respective tools.

The challenge set for the hackathon was for individuals/ teams to develop a product idea by creating their own user journey and using as many of the OpIS tools as possible to develop their product. Individuals/ Teams were able to develop any type of idea/ solution, focusing on any type of sector.

A total of 44 eligible registrations of teams were received and managed by F6S with a total of 18 teams participating and 6 teams awarded for Open Competition #3.

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1 Introduction

This deliverable is "*D6.6 - Open Competitions on Consumer Products Innovation Challenges",* of the iPRODUCE project funded by the European Union's H2020 research and innovation programme.

The objective of this deliverable is to present the planning and delivery of the two open competitions and the Hackathon activities carried out within iPRODUCE from May 2021 to April 2023.

This deliverable has been developed within the framework of Task 6.4 - Open Competitions on Consumer Products Innovation Challenges. The objective of this task was to be able to work with the different iPRODUCE stakeholders to define the challenges and objectives of the competitions and attract and engage participants in these open competitions to enhance the value proposition of the project, identify any common market challenges including any pilot challenges.

This deliverable is structured in the following sections:

1. **Introduction**: This present section.
2. **Open Competition #1 (Solutions and services for the prosumer competition):** This section will review the framework and the objectives, challenges and timeline of this competition, the value proposition, promotional activities carried out, results of the competition and analysis and further considerations.
3. **Open Competition #2 (Open and collaborative innovation competition):** This section will also review the framework and the objectives of the competition, the challenges and timeline of this competition, the value proposition, promotional activities carried out, results of the competition and analysis and further considerations.
4. **Open Competition #3 (Hackathon):** This section will review the objectives of the hackathon, challenges, requirements, the timeline, format, the value proposition, promotional activities carried out, results of the competition and analysis and further considerations.
5. **Value of the competitions for the iPRODUCE project**
6. **Final Considerations**

2 Open Competition #1

The main objective of the Open Competition #1, titled **'Solutions and Services for the prosumer competition**', was to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of co-design and co-development. The competition ran from 5 May 2021 to 30 June 2021.

Full details of the competition are described in the sections that follow.

2.1 Competition framework: objectives, challenges, and timeline

2.1.1 Objectives

The objective of the Open Competition #1 was to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of co-design and co-development.

Participants were invited to submit their entries – in the form of ideas for products, services or similar – to one or more of the proposed competition challenges (Table 1).

The competition welcomed all ideas to the challenges, particularly those in a concept phase or early-stage prototyping and that required design and functionality improvements. The competition would support winners in the collaborative design and development of new and early-stage solutions to any of the proposed themes, helping these solutions reach further stages of prototype development and implementation.

It was defined that the submissions to the competition should be original ideas, and that exact copies of any idea or solution would not be accepted. As part of the submission process, contestants were required to demonstrate the novelty of their idea or solution, taking into account other ideas and solutions already developed by themselves or by others. Furthermore, contestants were also requested to describe how their participation in the competition would contribute to the success of their idea.

2.1.2 Challenges

Several challenges were defined for Open Competition #1. The challenges were defined through a co-creation process involving the various cMDF partners. Partners were requested to define challenges aligned with their respective cMDF activities and that would bear results or foster activities to increase the value of their cMDF.

The challenges were then organised into sectors, where each sector had a different number of challenges that submissions could address. Participants were then invited to submit their ideas to one or more of the challenges (Table 1).

Table 1. Open Competition #1 challenge descriptions

Sector	Challenge and description
Furniture	**Furniture to play** *Challenge description: Add a slide to your kid's bed and make their room a whole*

Sector	Challenge and description
	new experience. *The challenge is to incorporate design and functionalities to kids/ youth furniture to support their cognitive development and help with their emotional intelligence. Propose creative ideas and participate in adding functionalities and design to kids/ youth furniture to make it multi-functional and playful, which will facilitate experimentation and support cognitive development, among other benefits*.
Medical	**Design and develop an antistress toy**[1] *Challenge description: working from home may bring new challenges to the work-life balance, and ultimately cause moments of stress.* *The challenge is to design and develop an antistress toy in order to boost the mental health of remote workers or students. In this challenge, makers can use their 3D printers.* **Protective gear or gadgets for travel during the pandemic**[2] *Challenge description: as flights are increasingly resuming, an increasing amount of people are expected to travel for leisure or professional reasons.* *The challenge is to design and develop protective gear or gadgets that can be safely used for travelling during the ongoing pandemic.*
Mobility	**DIY and eco-friendly Urban Mobility Device** *Challenge description: A frugal, recycled & easy to manufacture urban mobility solution.* *The challenge is to design a mobility solution for the urban environment that allows the daily travel of one or more people. This solution will have to consider specific criteria:* ● *To allow the daily displacement on distances of approximately 15kms.* ● *The manufacturing will have to be able to be carried out in a fab lab (MIT charter) and to integrate recycled products sourced locally.* ● *The manufacturing cost should not exceed 500€.* **Plug and Play renewable energy bike production and storage** *Challenge description: Create a system of production and storage of renewable energy adapted to any bicycle.* *The challenge is to design a solution that generates and stores electrical energy on conventional bicycles. The system will allow the use of both human effort or renewable energies to recharge a battery that will provide electricity to charge a device, power the lights of the bike or add options to the bike (e.g., turn signals). The system must be plug and play and adaptable to all conventional bikes.*
Mechatronics	**Remote Smart Watering system** *Challenge description: Remotely water and control your plants while you're away from home.* *The challenge is to design a case for the IoT sensors/actuators that must be inserted into the plant pots to collect data about humidity and temperature, to transmit data to a supervision station and to actuate central commands. The case must be functionally and aesthetically suitable for selling to hobby shops/mass retail channels. Propose creative ideas to make the watering system a design*

[1] Regulation-free challenge.
[2] Regulation-free challenge.

Sector	Challenge and description
	object useful and decorative for your home. **Vintage Ventilation System for your house** *Challenge description: Make it feel like you're living a comfortable and hot summer all year round.* *The challenge is to design a ventilation system (a sort of large fan) for top class houses that must combine effectiveness with design. The fan is connected to a robotic shaker that moves it linearly. The case must be functionally and aesthetically suitable for selling to hobby shops/mass retail channels. Propose creative ideas to make the ventilation fan system a design object useful and decorative for your home.*
Multisector	**Product conformity tool (PROOF)** *Challenge description: start-ups need help to bring their product to market. One of the most overlooked problems they face is identifying which certificates and conformity declarations are required to bring their products to the market. That is why we dream of a "product conformity tool (PROOF)".* *The challenge is to conceptualise a tool that would allow start-ups to find all required certificates (e.g., RED (radio emissions directive), GPSD (General Product Safety Directive), and packaging and waste regulations) that are relevant to their product and market for a low cost and to get connected to a database of test facilities available at low cost that provide certifications.* **Digitalising training for fablabs and users** *Challenge description: many of the existing training kits resort to traditional means, such as videos, and often aren't creative or efficient at passing their messages.* *The challenge is to conceptualise a new and creative way of delivering training and tutorials to fablabs and other users, making use of existing or new tools, techniques and/ or approaches.*

2.1.3 Timeline

The Open Competition #1 ran from 5 May 2021 to 30 June 2021 (17h00 CET), which corresponded to the time window in which interested applicants could submit their proposals.

The prizes would be delivered after the evaluation and selection phase and would end at the end of December 2021 (Table 2).

Table 2. Open Competition #1 period

Activity	Date
Opening date for submissions	5 May 2021
Closing date for submissions	30 June 2021 (17h00 CEST)
Evaluation of entries	1 July 2021 – 9 July 2021

Selection/ notification of competition winners	14 July 2021
Start date for delivery of award	15 July 2021
End date for delivery of award	17 December 2021

2.2 Value proposition

The iPRODUCE competition aimed to offer awarded participants with support in the form of technical assistance, mentoring, and visibility. The iPRODUCE team would support winners in maturing and refining their proposed ideas through dedicated co-design and co-development sessions. Furthermore, depending on the awarded ideas and solutions, the iPRODUCE partners would make available materials, tools, equipment, and infrastructure to support the materialisation of their proposed solutions.

The technical assistance and mentoring aimed to help contestants turn their ideas into tangible solutions and products. Awarded contestants would also be provided with visibility of their ideas and, depending on the maturity of the solutions, marketing and commercialisation support would be provided (e.g., matchmaking services, funding opportunities).

In this competition, the top three (3) entries would receive an award in prize money and additional support (e.g., technical, mentoring, visibility).

2.3 Promotion activities

The Open Competition #1 was widely promoted through various channels and with the support of the iPRODUCE partners. The following promotional efforts can be highlighted:

- Competition page on the iPRODUCE website (Figure 1).
- Competition page on the F6S platform, where the contestants were required to submit their proposals (Figure 2).
- Press release about the launch of the competition on the European Commission's CORDIS platform (Figure 3).
- Posts on the iPRODUCE social media platforms, such as Twitter (Figure 4, Figure 5).
- Promotion by iPRODUCE partners on their own institutional websites, including AIDIMME, AidPlex, Excelcar, Makerspace.

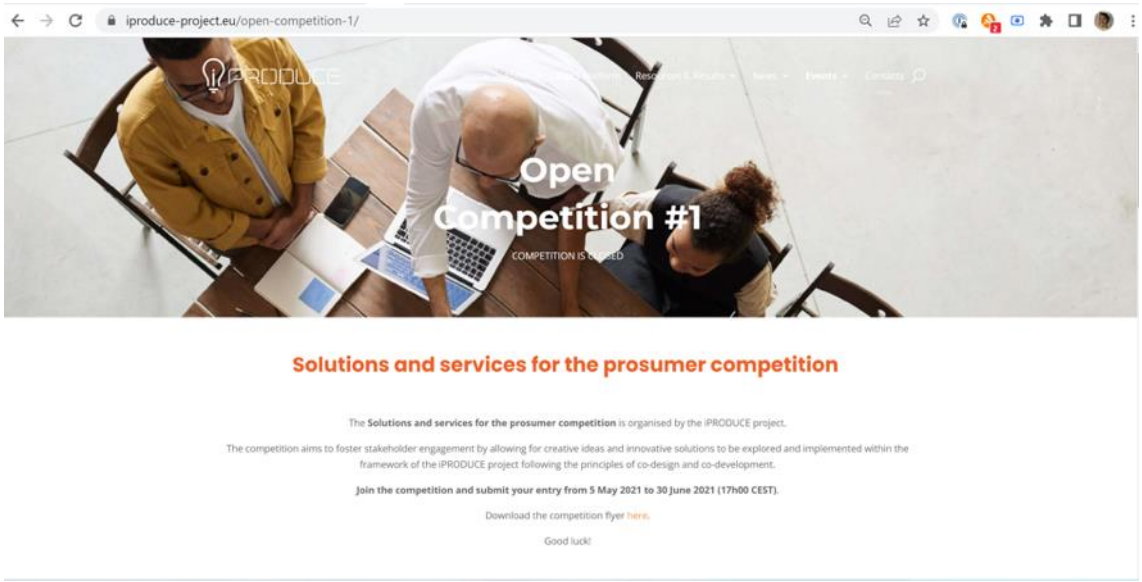


Figure 1. Open Competition #1 page on the iPRODUCE website

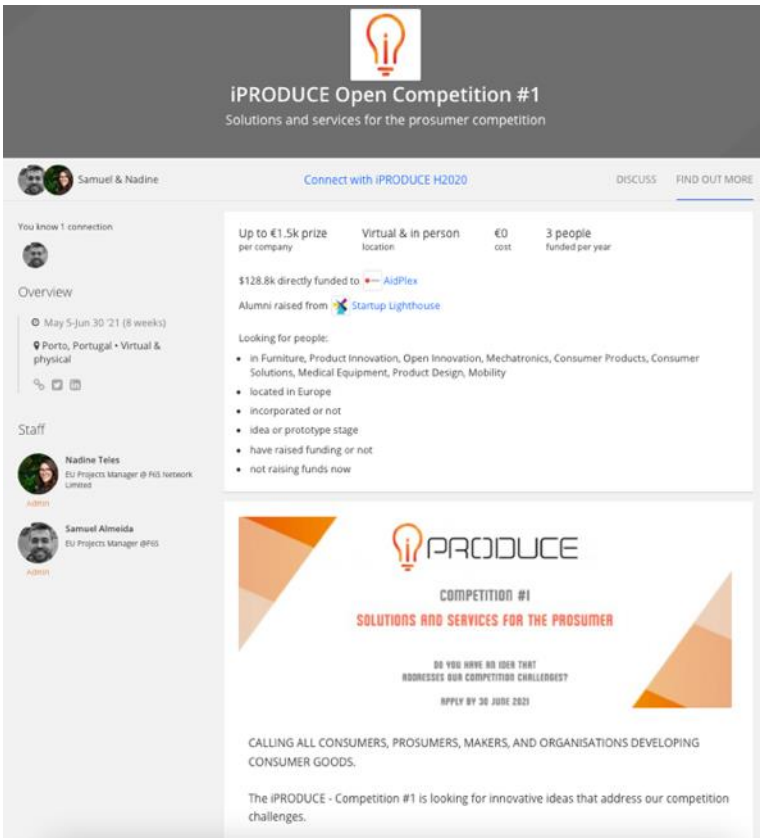


Figure 2. Open Competition #1 page on the F6S platform

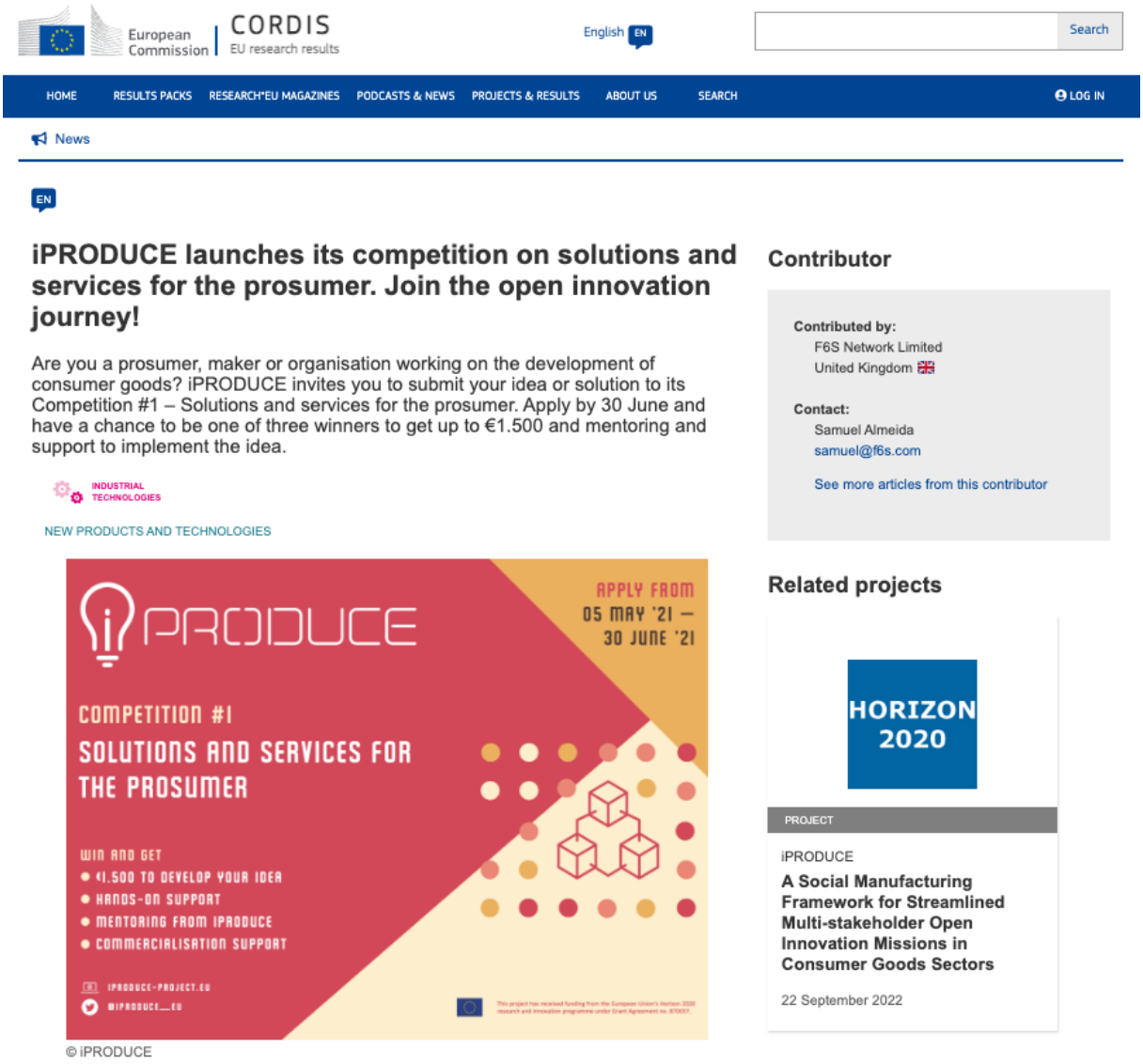


Figure 3. Open Competition #1 press release on the CORDIS platform

Figure 4. Open Competition #1 launch post on Twitter

Figure 5. Open Competition #1 closing post on Twitter

2.4 Results

After closing an 8-week long competition window, the partners proceeded with the evaluation of the submissions received. Despite the effort made by all partners to broadly promote the competition, the result in terms of participation was underwhelming and below expectations.

A total of 13 proposals were launched on the F6S platform, which was used to receive and manage submissions. Of these, only four were formally submitted to the competition. Having analysed these submissions, their respective quality was deemed unfit for the scope of the competition. All four proposals were marked non-eligible as they did not meet one or more of the minimum eligibility criteria (e.g., contestant and entry criteria) to participate in the competition, namely:

- Not providing a submission following the template and guidelines provided or having provided a submission other than in the English language.
- Not being from one of the eligible countries.

Based on these results, competition participants were informed that the competition would not proceed given that the entries were not eligible and that the objectives of the competition could not be fulfilled.

2.5 Analysis and further considerations

Following the results of the first competition, the partners involved thoroughly discussed the plausible reasons that led to the competition outcome. Several possible reasons emerged, namely:

- The procedures, while considered to have been well defined, might have been excessively complex for the type of competition being organised. This may have both limited the number of

potential participants, as well as the quality of the submissions from those that in fact did submit. Therefore, the agreement was that for the second competition an effort be made to simplify the general procedures of the competition.

- While there was a direct involvement of the cMDFs in the definition of challenges and they would be equally involved in the delivery of the prize, a more visible connection between the competition activities and the cMDFs may have fostered more participation.
- The total number of challenges (9) may have been more discouraging rather than encouraging. This is, as the different challenges would generate potentially different activities and results, and no specific distinction would be made between challenges, participants may have felt discouraged to participate as it would not be clear how their submission for one challenge would compare to a submission to another challenge.
- The prizes and how they would be delivered to winners may not have been sufficiently clear or appealing to the participants.

Based on this initial assessment, the partners agreed on some preliminary changes and expected improvements for the second competition, namely:

- Organise a main competition that is divided into smaller competitions organised at the local cMDF level, leveraging local ecosystems, and enabling more direct contact with the community and potentially more participation.
- Define clearer competition guidelines and challenges, linked to the local competition and the cMDF activities.
- Develop documentation in English and the language of the local competition, enabling higher participation from those less comfortable working in English.
- Define clearer and more attractive prizes associated with the local challenges, to minimise doubt about what the contestants will in fact receive.
- Increase promotion, particularly at the local level, by enabling multilingual communication.

Based on the analysis made and identified areas of improvement, the partners closely followed these ideas in the definition of the second open competition.

3 Open Competition #2

The main objective of the Open Competition #2, titled '**Open and collaborative innovation competition**', was to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of open and collaborative innovation. The competition ran from 7 February 2022 to 24 June 2022. The delivery of the prize ran until the end of June 2022. Given the nature of the competition, further specific deadlines applied to each cMDF sub-competition.

Full details of the competition are described in the sections that follow.

3.1 Competition framework: objectives, challenges, and timeline

3.1.1 Objectives

The objective of the competition was to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented within the framework of the iPRODUCE project following the principles of open and collaborative innovation.

Building on the lessons learnt from the first competition, sub-competitions were organised at the local level, particularly by each cMDF. Therefore, participants were invited to submit their entries to one of the specific competitions organised within the project's cMDFs.

In general, the competition welcomed ideas and solutions that addressed the challenges and topics defined for the specific cMDF competition, which may be at different stages of development. The competition aimed to support the development of submitted ideas and solutions (e.g., project/ product) in an open and collaborative way by providing the applicants with the tools and support to materialise them.

As part of the submission process, contestants were required to describe the idea or solution they are submitting to the competition, the expected impact, and motivation to develop and implement their idea or solution. Other information specific to each cMDF competition was applicable.

Awarded contestants were also provided with visibility of their ideas or solutions and, depending on the maturity of the solutions, marketing and commercialisation support was provided (e.g., matchmaking services, funding opportunities).

3.1.2 Challenges

The challenges for each sub-competition (Table 3) were defined by the respective cMDF partners. The challenges were mostly in line with their respective cMDF activities which involved those that have increased the awareness and value of each of the cMDFs.

Table 3. Open Competition #2 challenge descriptions

cMDF competition	Challenge description
France	**iPRODUCE MyMobility** ***Challenge:***

cMDF competition	Challenge description
	● Create an ecosystem at European and local level, bringing together actors with complementary means and skills around common projects. ● Democratise the concept of Social Manufacturing and promote co-creation methods to develop new products and services, including the end user at the heart of development. ● Facilitate exchanges and knowledge sharing through the development of the digital platform and iPRODUCE tools. The objective is to help with "collaborative innovation" by helping to design and test an idea and product with experts in the field and future informed customers, and to provide early feedback to better target innovation and its future market.
Germany	**Products for the future** ***Challenge:*** We currently have many challenges (sustainability / environmental protection, social inequality, globalisation): which product idea tackles them? What is your product for the future? This challenge is looking for a product idea that tackles these challenges above. A consumer good (product) for the future. The objective is to address current challenges related to sustainability, environmental protection, social inequality, and globalisation, among others. Applicants are invited to submit product ideas that tackle these challenges and address future needs.
Greece	**3D Collaborative Manufacturing in Education & Culture** ***Challenge:*** ● Select one of the proposed challenge ideas, or; ○ 3D Printed Protective Equipment ○ 3D Printed Smart Luminous Artefact ● Co-create and co-design an object, related to a country and culture of their choice. The objective is to contribute to the cultural education of elementary or middle school students, through 3D collaborative manufacturing activities; and to encourage the participation of schools/students, allowing for creative ideas and innovative solutions to be explored and implemented, by following the principles of co-design and co-development.
Italy	**i-NOVATION** ***Challenge:*** Participants are requested to submit a project idea (one per participant) concerning the development of a solution/product in the following main fields: ● mechanics; ● mechatronics; ● electronics; ● consumer products; ● design; ● other (specify) Activities involve the prototyping technologies typical of fablabs and the world of makers (by way of example, but not limited to: 3D printing, Arduino, Raspberry Pi, co-design, etc.). The solution/product must be able to be made according to existing manufacturing technologies. Software can be part of the solution/product but it cannot be the entire solution/production. Participants must describe their own project both technically

cMDF competition	Challenge description
	(including how they would like to use OpiS platform tools for the creation of their solution/product) and in terms of social/entrepreneurial/market impact, relevant to iPRODUCE. Motivation behind the idea and the participation to the competition must be addressed, too. The objective is to foster stakeholder engagement by allowing for creative ideas and innovative solutions to be explored and implemented following the principles of co-design and co-development. Participants are requested to submit a project concerning the development of a solution/product in the following main fields: mechanics; mechatronics; electronics; consumer products; design; or others.
Spain	**INNOVAMOBEL** ***Challenge:*** The presentation of a product idea for the home, preferably furniture, in the basic project phase, that is innovative or that provides some improvement or novelty on an existing product is expected. Ideas must be original, and not previously developed. The objective is to promote innovation in the habitat sector, therefore choosing the most innovative product idea, in the basic project phase, and will tutor it so that it becomes a physical prototype.

3.1.3 Timeline

The competition ran from 7 February 2022 to 24 June 2022. The delivery of the prize ran until the end of June 2022.

Each cMDF competition defined the number of winners and its own prizes, which included services, such as training to help develop the submitted idea or solution, access to equipment and infrastructure, etc. Awarded applicants also received a gift bag with iPRODUCE project merchandise (Figure 6). The prizes were delivered after the evaluation and selection phase (

Table 4).

Figure 6. Open Competition #2 Merchandise

Table 4. Open Competition #2 period

Activity	Date
Opening date for submissions	French, German and Spanish cMDFs - 7 February 2022 Greek cMDF - 8 March 2022 Italian cMDF - 8 April 2022
Closing date for submissions	French cMDF - 25 March 2022 German cMDF - 15 March 2022 Greek cMDF - 30 April 2022 Italian cMDF - 24 June 2022 Spanish cMDF - 25 June 2022
Evaluation of entries	French cMDF - 30 March 2022 German cMDF - 31 May 2023 Greek cMDF - 4 May 2022 Italian cMDF - 1 July 2022 Spanish cMDF - 15 June 2022
Selection/ notification of competition winners	French cMDF - 2 April 2022 German cMDF - 7 July 2022 Greek cMDF - 6 May 2022

Activity	Date
	Italian cMDF - 5 July 2022 Spanish cMDF - 19 July 2022
Start date for delivery of award	French cMDF - 2 April 2022 German cMDF - 9 November 2022 Greek cMDF - 10 May 2022 Italian cMDF - 21 October 2022 Spanish cMDF - 23 September 2022
End date for delivery of award	French cMDF - 31 December 2022 German cMDF - 12 April 2023 Greek cMDF - 31 May 2022 Italian cMDF - 31 January 2023 Spanish cMDF - 23 September 2022

3.2 Value proposition

The second iPRODUCE competition has been designed to offer the awarded participants with support in the form of technical assistance, mentoring, and visibility. Each cMDF competition defined the number of winners and its own prizes, which included services (e.g., training to help develop the submitted idea or solution), access to infrastructure, or others.

The iPRODUCE team was able to support winners in refining and advancing their proposed ideas in a collaborative way to support user-driven open-innovation and co-creation. Moreover, the participants were provided with the tools and support to materialise their solutions and products.

In the framework of the competitions, the following awards were set up for each cMDF:

Table 5. iPRODUCE Hackathon Awards per cMDF

cMDF	Awards

France	• 1 year of iD4CAR membership or 1 year of Materalia membership
	• 3 days of project coaching by Quest for Change, covering for example the following topics:
	  ○ Day 1: Work on the business opportunity and value proposition; Basis for market & competitive analysis
	  ○ Day 2: Business model; Business assumptions
	  ○ Day 3: Project industrialisation steps
	• Co-design of the digital model with a CAD expert dedicated to your product for 5 days.
	• Access to the design and prototyping resources of the Excelcar & Fablab Vosges for 3 months
	• Training in the use of prototyping facilities within Excelcar & Fablab Vosges

cMDF	Awards
	• Financing of consumables and materials dedicated to the prototyping of your product up to 3 k€ per project. • Organisation of experimentation sessions (depending on the maturity of the project) • Invitation to an event during the year dedicated to the incubates of Quest for change (invitation to a trade fair, webinar, ...)
Germany	• Support in the development up to the first prototype. • Help in finding partners for the further development of your product idea, distribution, or production, etc. • Increase the reach of your idea through newsletter articles and social media advertising.
Greece	Three prizes - Gold, Silver and Bronze - will be distributed to the participants from the school/ students. All the students of the three schools that will be the winners of the competition, will receive as an award 3D printed medals (gold, silver, bronze), with engraved logo of iPRODUCE project. The best idea (1st prize) will be manufactured using diverse 3D printing technologies. The students will have the chance to: • Have a real-time demonstration of 3D printing process • Have a guided tour in the infrastructures of Additive Manufacturing Unit (AMU) of CERTH/ITI and of AidPlex • Utilise the OpIS platform of iPRODUCE, in order to co-create and evaluate their idea
Spain	The prize will consist of developing the selected project and turning it into an executive project, including the manufacturing of the project prototype on a 1:1 scale if possible. As part of the award, the selected person will learn from the cMDF the most appropriate technology for the manufacturing of the prototype and will receive support and advice for its materialisation.
Italy	• Training: specific online training about the iPRODUCE tools tuned to their solution/product. • Promotion: promotional video about the solution/product. • Guided tour to the Italian cMDF facilities, professional support by prototyping experts.

cMDF	Awards
	• Use of iPRODUCE facilities: 8 hours of use of the Italian cMDFs labs (one facility, to be chosen upon agreement with the single cMDF partner) • Coaching about entrepreneurial ideas linked to the solution/product: 4 hours business model canvas coaching with cMDF experts

3.3 Promotion activities

The Open Competition #2 was promoted extensively through various channels and with the support of the iPRODUCE partners. The following promotional efforts can be highlighted:

- Competition page on the iPRODUCE website (Figure 7).
- Posts on the iPRODUCE social media platforms, such as LinkedIn (Figure 8, Figure 9, Figure 10) and Twitter (Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, and Figure 16).
- Promotion by iPRODUCE partners on their own institutional websites, including AIDIMME, Trentino Sviluppo and Excelcar
- Promotion by iPRODUCE partners and representatives via their institutional or personal social media platforms, such as Twitter, LinkedIn, Facebook and YouTube (Figure 17, Figure 18, Figure 19, Figure 20, and Figure 21).

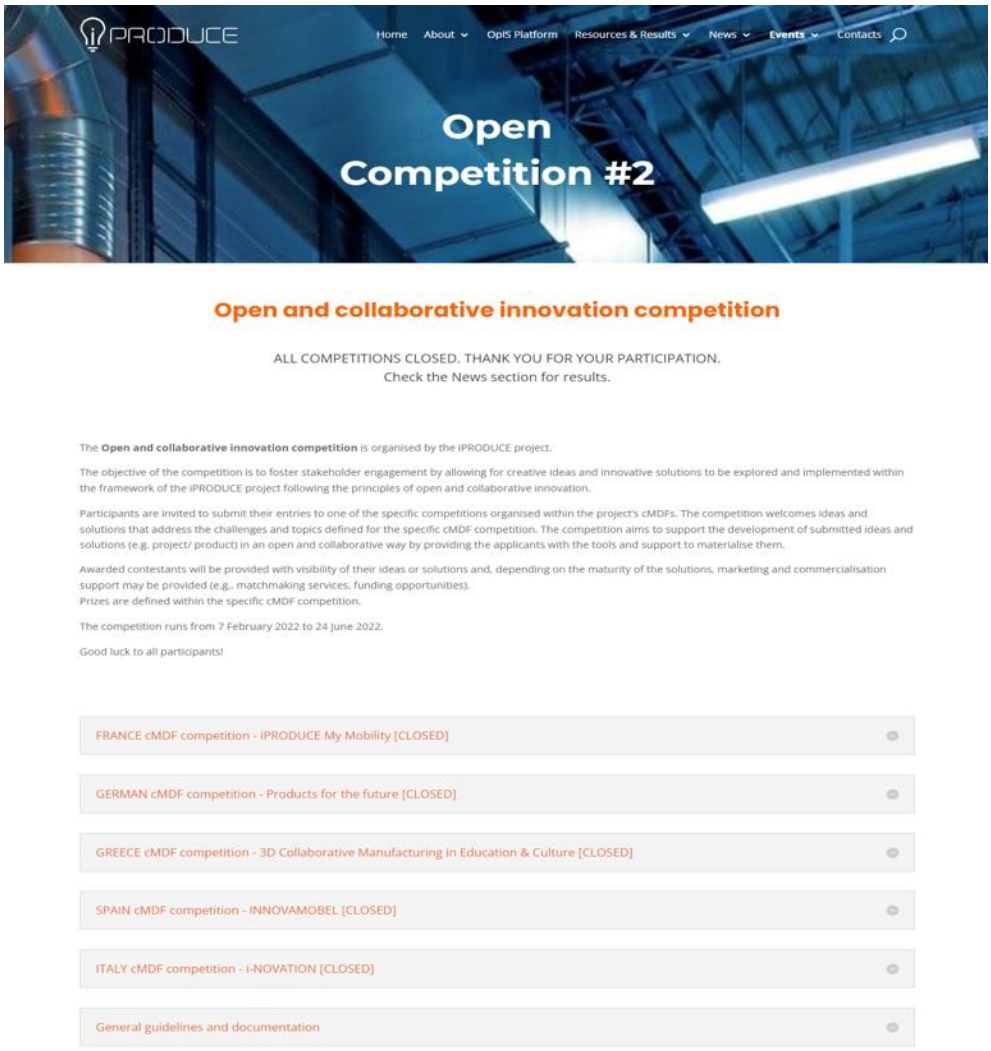


Figure 7. Open Competition #2 on website

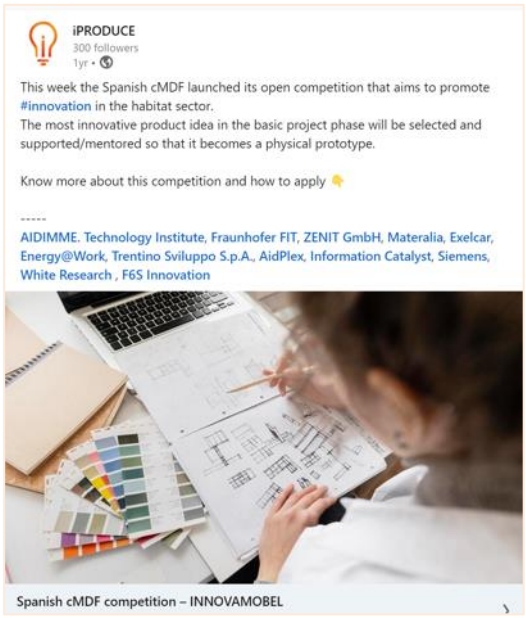


Figure 8. Open Competition #2 on LinkedIn (Post 1)

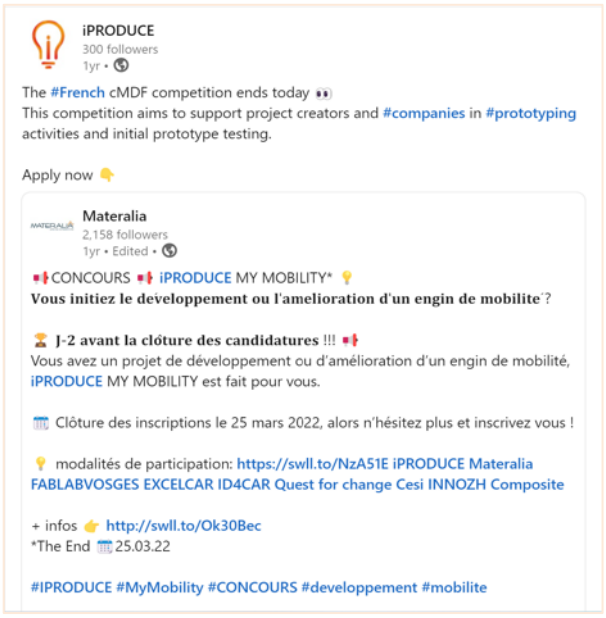


Figure 9. Open Competition #2 on LinkedIn (Post 2)

Figure 10. Open Competition #2 on LinkedIn (Post 3)

Figure 11. Open Competition #2 post on Twitter (1)

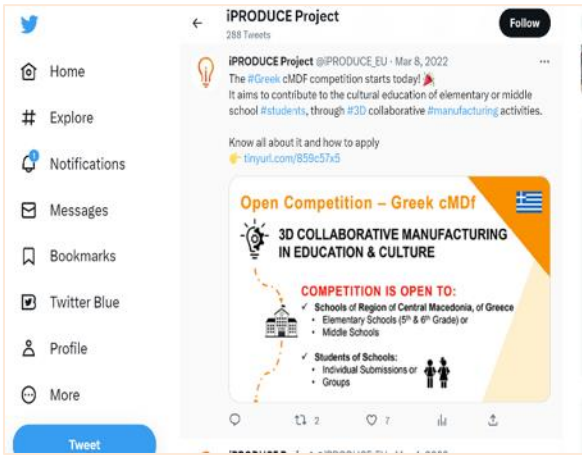


Figure 12. Open Competition #2 posts on Twitter (2)

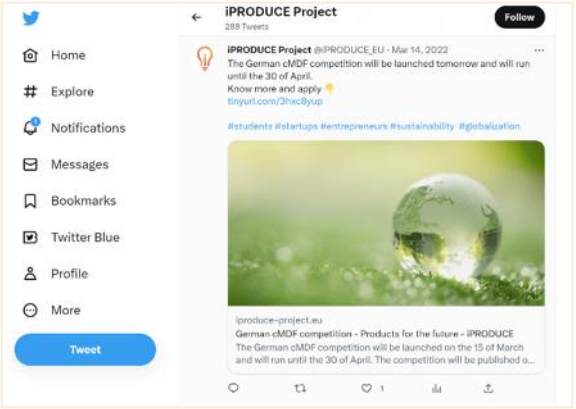


Figure 13. Open Competition #2 posts on Twitter (3)

Figure 14. Open Competition #2 posts on Twitter (4)

Figure 15. Open Competition #2 posts on Twitter (5)

Figure 16. Open Competition #2 posts on Twitter (6)

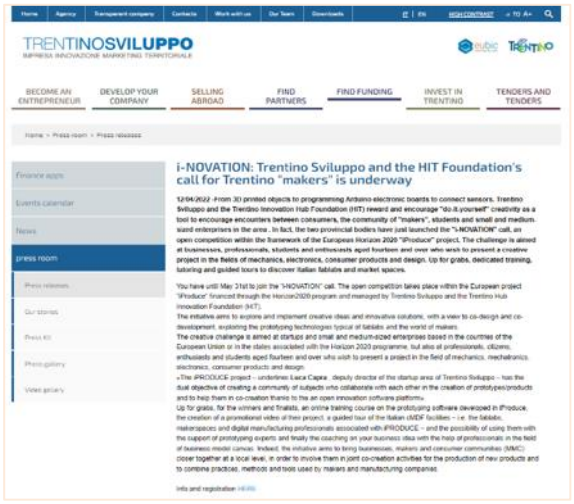


Figure 17. Open Competition #2 promotion by iPRODUCE Partners (1)

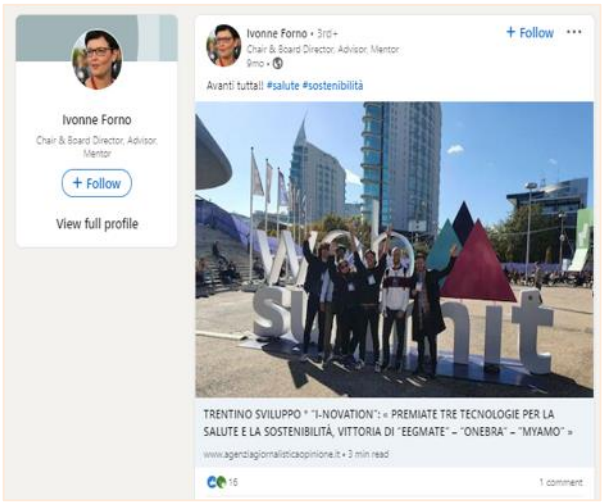


Figure 18. Open Competition #2 promotion by iPRODUCE Partners (2)

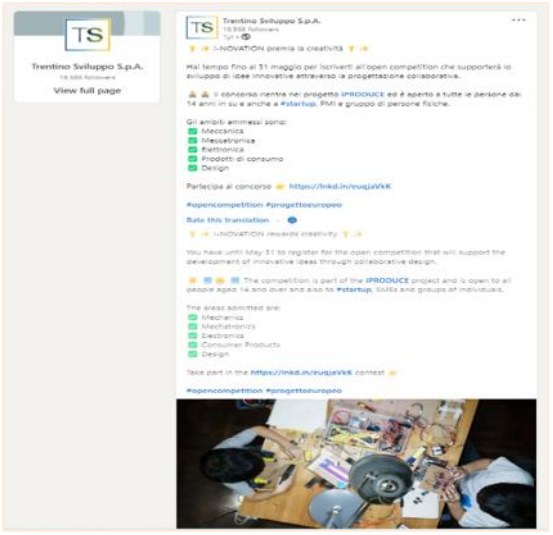


Figure 19. Open Competition #2 promotion by iPRODUCE Partners (3)

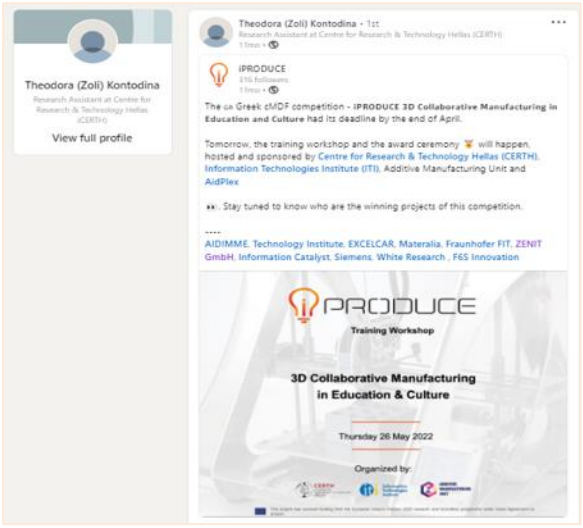


Figure 20. Open Competition #2 promotion by iPRODUCE Partners (4)

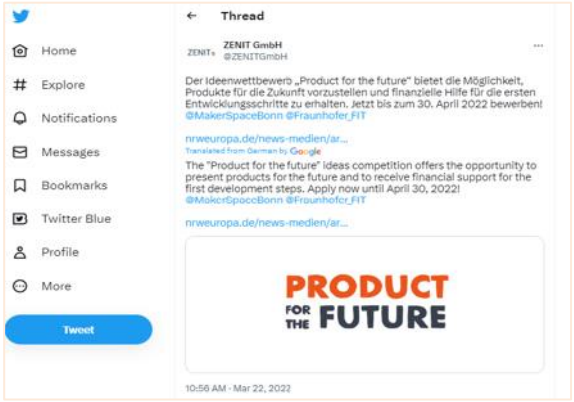


Figure 21. Open Competition #2 promotion by iPRODUCE Partners (5)

Figure 22. Open Competition #2 promotion by iPRODUCE Partners (6)

3.4 Results

After closing each of the local competition windows, the partners proceeded with the evaluation of the submissions received. Partners received a broad range of applications with the following number of proposals received from each cMDF below (Table 6).

Table 6. Number of proposals received and awarded winners – Open competition #2

cMDF competition	Number of proposals received
France	8 submissions received with 3 submissions awarded (4 people awarded).
Germany	11 submissions received with 1 submission awarded (5 people awarded).
Greece	9 submissions received with 3 submissions (Gold, Silver, Bronze) awarded (55 people awarded).
Italy	8 submissions received with 2 finalists and 1 submission awarded (10 people awarded).
Spain	3 submissions received with 3 submissions awarded (3 people awarded).

A total of 39 submissions were received and managed by the cMDF partners with 11 submissions awarded (involving 75 people) for Open Competition #2.

Below are details of the winners for each of the local cMDF competitions:

3.4.1 France

The French cMDF competition – iPRODUCE My Mobility – deadline for submissions was on 25 March and received several interesting applications. Members of the French Core Group were invited to evaluate the submissions.

To apply for the "iPRODUCE My Mobility" challenge, candidates had to complete an application form that assessed their suitability for the competition. The application consisted of various sections, each weighted differently in the final evaluation:

- Presentation skills of the candidate (5% of the final score)
- Project or product description (25% of the score).
- Targeted market for the project (20% of the score)
- Impact and value of the project (20% of the score). Current state of the project (15% of the score)
- Candidate's willingness and motivation to develop the project (15% of the score).

Once all the application forms were received, each member of the core group thoroughly evaluated each application to ensure a fair selection process. The final score was determined by taking an average of the evaluations given by all the members of the core group. The top three candidates were then designated as winners.

The winners of the "iPRODUCE My Mobility" challenge were then awarded support to further develop their project. The support provided included help to develop their business plan, access to the fablab, and assistance in securing grants if needed. This support allowed the winners to continue developing their ideas and bring them to market.

VLOTEK

The VLOTEK project (Figure 23) was led by Anthony Bordron. Guided by the motto “Less is more“, VLOTEK proposes simple, basic, economical, and popular disruptive alternatives to reduce the impacts of mobility and replace the use of the household’s second car. VLOTEK allows families with children and the most modest citizens, to achieve an accessible, sober, and local ecological transition towards sustainable and resilient mobility tools. For that, it provides two types of answers:

1. Several kits to extend/increase the functionalities of a standard bike to the specific needs of families and cyclists.
2. A 4-person vehicle, a symbol of minimalism and frugality on wheels (the brand’s “Jolly Rogers” project). This is intended for people to use in their daily trips, such as going from home to school/work or running errands. By using this vehicle, a person can ride with two or three more people or transport loads, in a sheltered area, using a bicycle lane, in safety, and at a lower cost both to buy and to use.

Figure 23. First French Open Competition #2 Winner – VLOTEK project

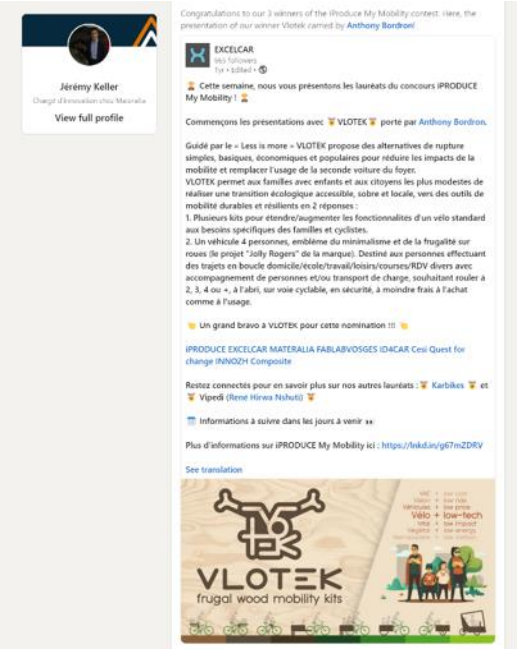


Figure 24. First French Open Competition #2 Winner announced on Excelcar LinkedIn Post

KARBIKES

The KARBIKES project (Figure 25) was carried out by Lucas Vançon and Gaëlle Richard. KARBIKES is the crossing of the bicycle and the car. To move around all year long without polluting and in safety, KARBIKES develops several models of electric cargo bikes equipped with four wheels for stability and a body for protection against the weather.

The two-seater tandem model allows you to go out as a couple, do the shopping, or transport up to two children. The cargo models are adapted to the expectations of professionals that deliver parcels or transport equipment and even cab bikers. In short, KARBIKSES allows you to experience the pleasure of the bike and the comfort of the car.

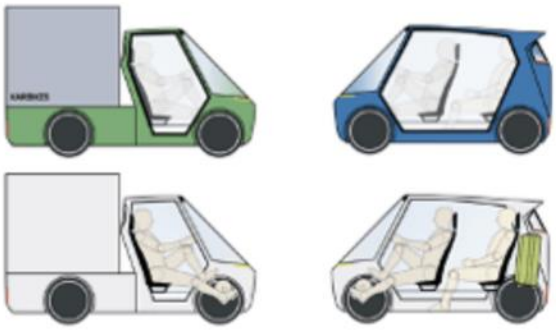


Figure 25. Second French Open Competition #2 Winner – KARBIKES project

VIPEDI

René Hirwa Nshuti led the project VIPEDI. VIPEDI aimed to improve urban mobility with a folding bicycle solution, perfectly adapted to intermodality, thanks to its one-step folding mechanism. VIPEDI would allow its users to combine several modes of transportation easily and quickly during the same trip while maintaining a daily physical activity.

Figure 26. Third French Open Competition #2 Winner – Vipedi project

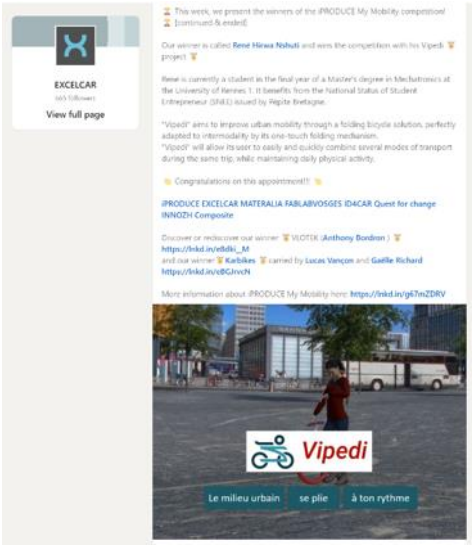


Figure 27. Third French Open Competition #2 Winner announced on Excelcar LinkedIn Post

3.4.2 Germany

The German cMDF competition – Products for the Future – ran during the Spring and was looking for students, startups, entrepreneurs or individuals with a vision, or experience, of the challenges of today's world, such as sustainability, environmental protection, social inequality, and globalisation.

The jury members came from Fraunhofer FIT, Deutsche Telekom Stiftung and Makerspace Bonn. They were given the evaluation criteria that had been defined by the German cMDF:

- Creativity
- Sustainability
- Market feasibility
- Technical feasibility

The winning team has received advice and support regarding the realisation of the project and the range of opportunities there are for its implementation. In April 2023, the winning team also received six prototypes implemented with two different processes to choose from with the help of the cMDF to help find a production partner for the small series if required.

The prize for first place was a startup grant for the initial development steps, including support in the development up to the first prototype and finding partners for further development of the product idea and distribution of the production. In addition, the winning team also benefited from promotion in social media and newsletters, to increase the reach of the dissemination of their idea.

AUDIOMOTHS

The winner of the German cMDF competition was Vera Prenzel and her colleagues from a research group at the Centre for Biodiversity Monitoring and Conservation Research (ZBM) of the Leibniz Institute for Biodiversity Change Analysis (LIB) – Museum Koenig in Bonn.

The team's idea was to develop a cover for acoustic recording devices, so-called "AudioMoths", which offers good weather protection, especially against moisture. AudioMoth devices are a low-cost open-source development and are already finding their first applications in citizen science projects and in research, e.g., for recording animal voices such as bat and bird calls.

The team also wanted to pay special attention to the casing's resistance to heat and solar radiation through sufficient sealing.

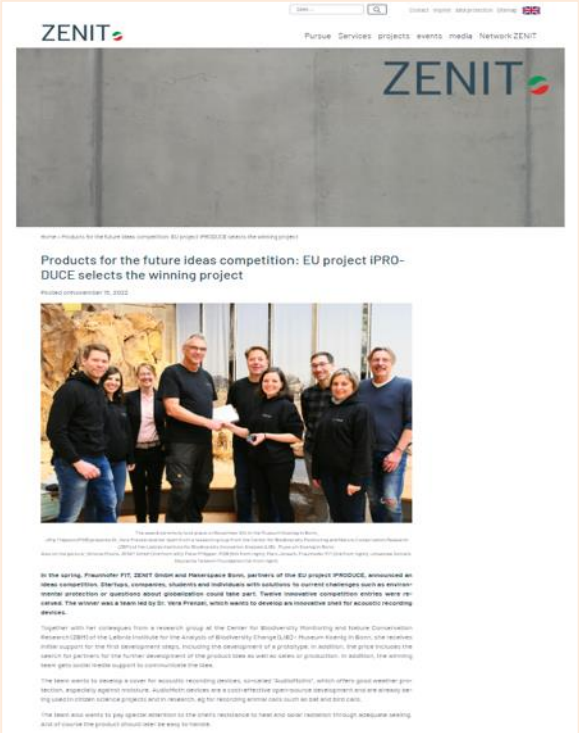


Figure 28. German Open Competition #2 Winner on ZENIT partner website

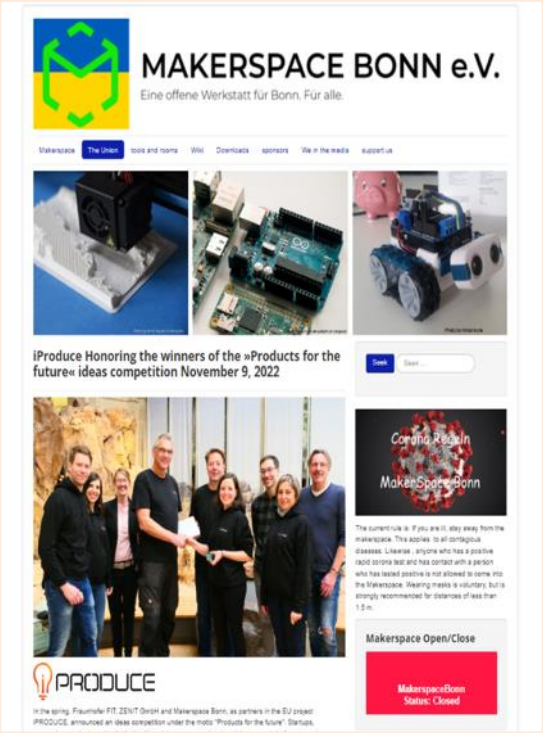


Figure 29. German Open Competition #2 Winner on MAKERSPACE BONN e.V. partner website

3.4.3 Greece

The Greek cMDF competition – 3D Collaborative Manufacturing in Education & Culture – ended on 30 April 2022 with nine submissions from 5th and 6th-grande elementary school students of the Region of Central Macedonia in Greece.

On 4 May 2022 a jury was set up to evaluate the proposals of the participants. The jury was composed of representatives of the Greek cMDF and local ambassadors of the following three entities: CERTH, AidPlex, and the Union of Parents & Guardians Association of Primary & Secondary Education, Municipality of Chalkidona

An award ceremony was held on 26 May 2022 where 40 students of the three schools that were announced as the competition winners received as an award 3D printed medals (gold, silver, bronze), with an engraved logo of iPRODUCE project.

The best idea (1st prize) was manufactured via diverse 3D printing technologies.

The students had the chance to have a guided tour on the infrastructures of the Additive Manufacturing Unit (AMU) of CERTH/ITI and a training workshop with real-time demonstration of the manufacturing process of their idea, including the 3D design, the 3D printing and the post-process procedures. Afterwards, they had the opportunity to attend a demonstration of the OpIS platform of iPRODUCE, to co-create and evaluate their idea.

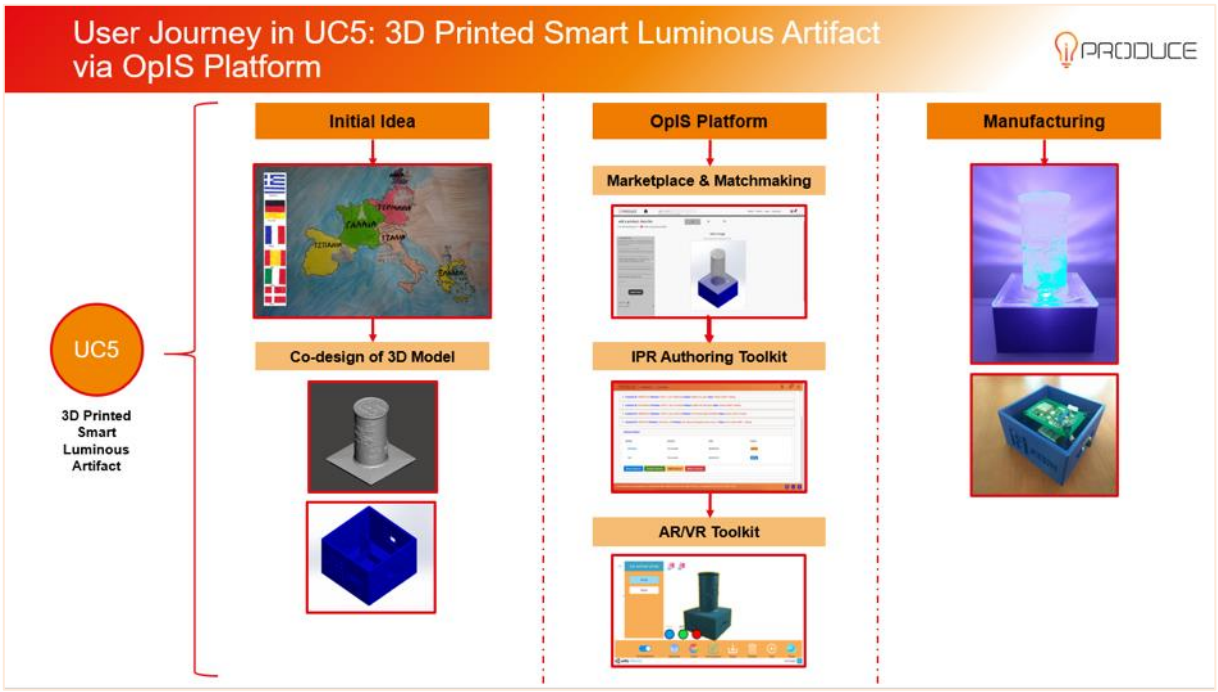


Figure 30. First Greek Open Competition #2 Winner, User Journey in OpIS platform of the use case scenario of the winning idea

ELEMENTARY SCHOOL OF KOUFALIA

The first winner of the Greek competition was the 2nd Elementary School of Koufalia, of the Region of Thessaloniki in Greece. For this specific project idea, 17 students of the 6th grade of the Elementary School have participated and presented their idea, which was based on creating a map with the borders of the six European countries of the iPRODUCE cMDFs, including: Denmark, France, Germany, Greece, Italy and Spain. Additionally, they have selected to depict features related to the culture of each country.

Figure 31. First Greek Open Competition #2 Winner - Image 1

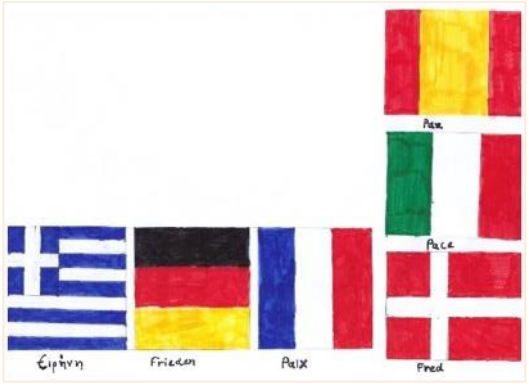


Figure 32. First Greek Open Competition #2 Winner - Image 2

ELEMENTARY SCHOOL OF PROHOMA

The second winner was the Elementary School of Prohoma, of the Region of Thessaloniki in Greece. For this specific project idea, 37 students of the 5th and the 6th grade of the Elementary School participated and presented their idea, by creating a mock-up of the smart luminous artefact, of the White Tower, which is a characteristic monument of Greece.

Figure 33. Second Greek Open Competition #2 Winner

ELEMENTARY SCHOOL OF LOUDIA

The third winner was an individual submission of a student of the Elementary School of Loudia, of the Region of Thessaloniki in Greece. This student designed the Eiffel Tower as a typical monument of France.

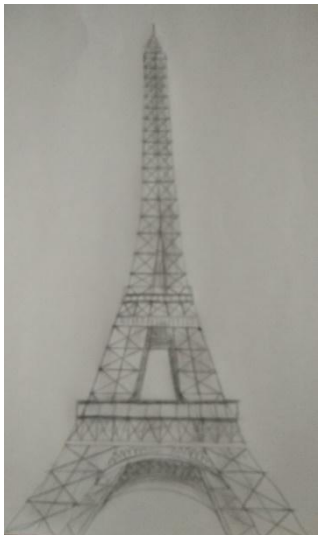


Figure 34. Third Greek Open Competition #2 Winner

The Greek cMDf organised a training workshop and an award ceremony on Thursday 26 May 2022. All students of the Elementary and Middle Schools of the three winning ideas received a prize including 3D printed medals (gold, silver and bronze) with an engraved logo of the iPRODUCE project.

Figure 35. 3D Printed Prizes for Winners of Greek Open Competition #2

Figure 36. Award ceremony of First Greek Open Competition #2 Winner, 3D Printed Golden Prize

Figure 37. Award ceremony of Second Greek Open Competition #2 Winner, 3D Printed Silver Prize

Figure 38. Award ceremony of Second Greek Open Competition #2 Winner, 3D Printed Bronze Prize

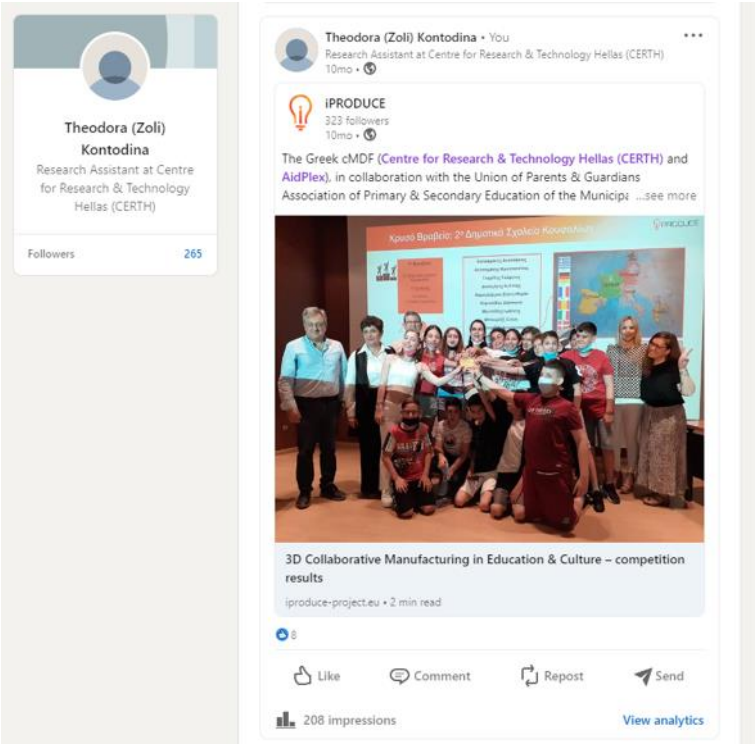


Figure 39. Award ceremony of First Greek Open Competition #2 Winner announced on LinkedIn

3.4.4 Italy

The Italian cMDF competition – i-NOVATION – closed on 31 May 2022, with eight applications having been submitted: one from a research centre, one from an SME and six from groups of individuals (in total 19 people took part in these groups).

From the eight applications, three were awarded. The results of the Italian open competition were also published in the Italian media press (Ufficio Stampa della Giunta provincial, L'adigetto.it, UnserTirol, and Agenzia giornalistica Opinione).

On 1 July 2022 a Commission was set up by the Director of Corporate Services of Trentino Sviluppo S.p.A. (main member of Italian cMDF), whose task was the verification of the formal eligibility requirements and the criteria for the registration of applications received on the web platform https://agora.trentinosviluppo.it.

The competition was open to natural persons, groups of natural persons and legal persons enterprises (Startups and SMEs).

On 5 July 2022, an Evaluation Committee, consisting of six experts from the Italian cMDF met remotely and evaluated the projects according to the following criteria:

- Criterion 1 | Candidate/ Team Presentation - Weight: 5%
- Criterion 2 | Description of the Idea/ Solution - Weight: 25%
- Criterion 3 | Reference Market/ Business Potential - Weight: 20%
- Criterion 4 | Value and Impact - Weight: 20%
- Criterion 5 | State of the Idea/ Solution - Weight: 15%
- Criterion 6 | Motivation - Weight: 15%

The Commission then drew up the merit list determining the three winning projects. The prizes were gadgets of iPRODUCE and the support of the Italian cMDF to design and realise the prototypes.

EEGMate

The EEGMate is an innovative tool for the preparation of the electroencephalogram. The preparation of the EEG is long, stressful and completely manual. The EEGMate makes the procedure simple, semi-automatic, and cuts preparation time and costs. The members of the group behind this project came from the School of Innovation Trento and are: Giacomo Bertazzoli (head of the group); Alessandro Angeletti; Andrea Ferraresi; Placido Falqueto; Shripathy Swaminathan; Valentina Degano.

Figure 40. First Italian Open Competition #2 Winner

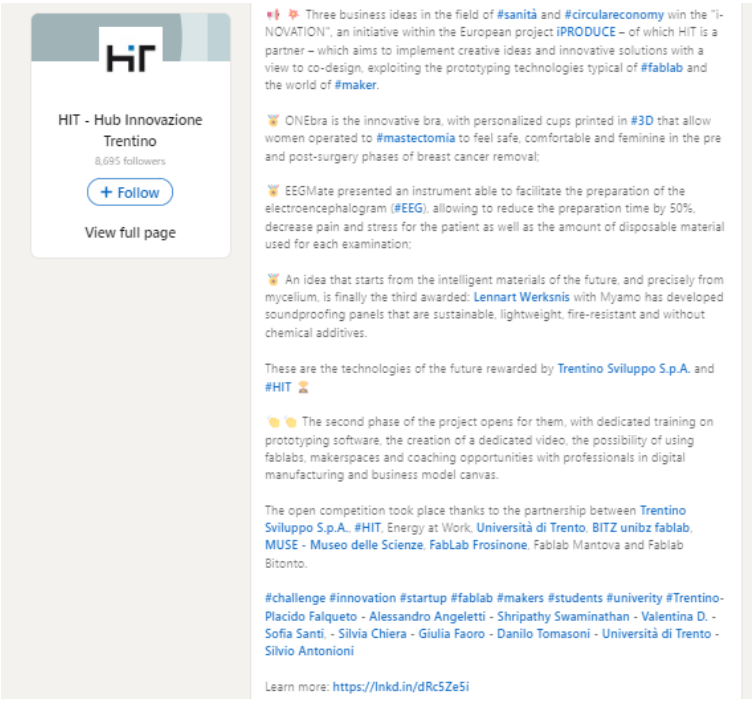


Figure 41. First Italian Open Competition #2 Winner announced on LinkedIn

ONEBra- libera di sentirti donna

The members of the group behind this project came from the School of Innovation Trento and are: Sofia Santi (head of the group) and Danilo Tomasoni. The goal of the ONEBra project is to provide personalised cups to women who have had a mastectomy, ensuring the symmetry of the breasts and the possibility of feeling free to express themselves again. ONEBra provides an alternative to silicone cups currently on the market (which do not allow comfort and safety) or filler inserts which, not being stable inside the bra, cause discomfort and embarrassment in women.

ONEBra cups are made starting from a 3D scan of the breast, done in total comfort and privacy by the client herself in her own home. In a few seconds, the scan is produced and sent to Onebra, which

processes it to obtain customised cups that are printed with 3D technology and inserted inside a comfortable, feminine bra made of sustainable materials. The finished product is finally sent to the client.

In addition, ONEBra wants to guarantee a community service to support women and people close to them during the pre- and post-surgery phases of breast cancer removal through the aid of information and support material, thus guaranteeing 360-degree help.

Figure 42. Second Italian Open Competition #2 Winner

Myamo – For a sustainable room acoustics

The members of the group behind this project are Lennart Werksnis and Katharina Querbach. Myamo is a sustainable, efficient, modular acoustic panel for indoor use that improves room acoustics with panels made from mycelium material, for example. The acoustic panels are sustainable, free of chemical additives, acoustically absorbent, lightweight, and naturally fire resistant.

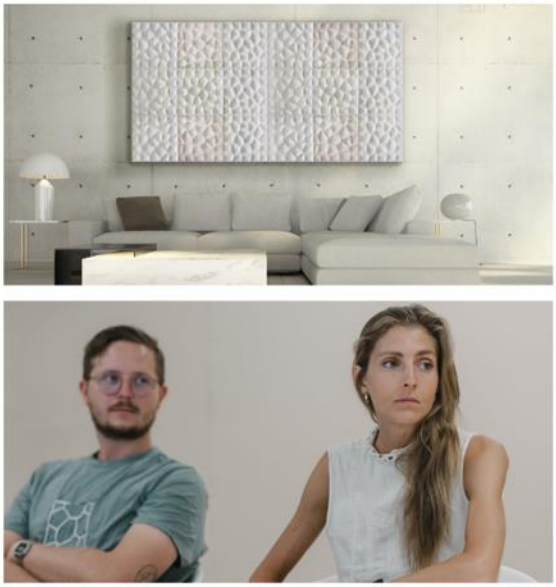


Figure 43. Third Italian Open Competition #2 Winner

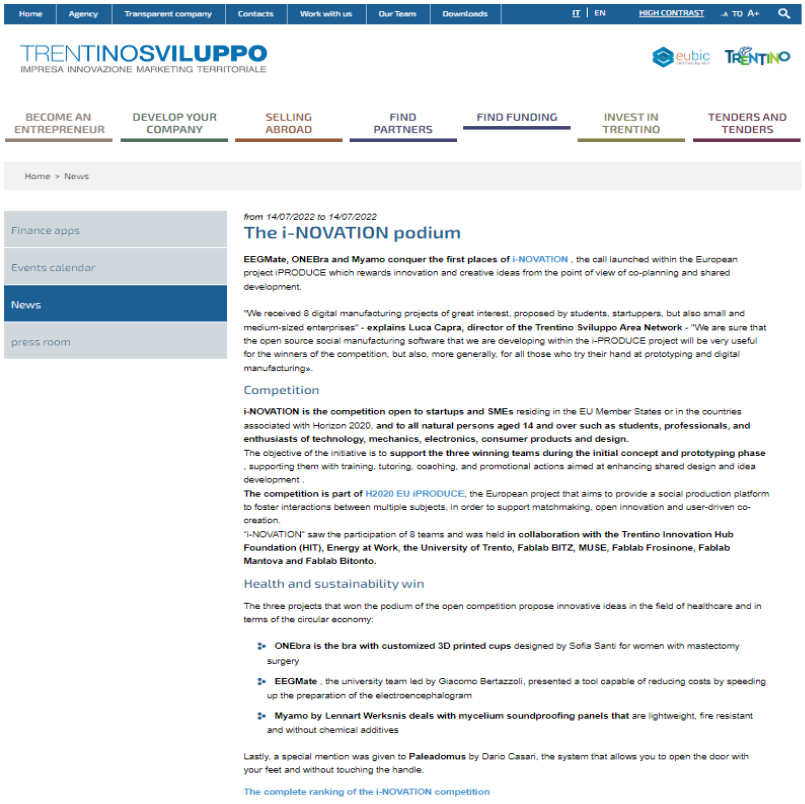


Figure 44. Italian Open Competition #2 winners announced on Trentino Sviluppo Partner website

3.4.5 Spain

The Spanish cMDF competition – INNOVAMOBEL – aimed to promote innovation in the habitat sector and targeted students and/or designers. The competition ended on 15 June 2022 with one winner and two finalists.

WORKit

WORKit is a project that emerges from the search for solutions to equip social housing from disused maritime containers.

The design responds to the spatial needs of the work area, and thanks to its modularity and customisation characteristics, it is adaptable to other spaces in the home. WORKit is configurable both in terms of space (height and width), as well as in its quantity and arrangement of accessories thanks to the adjustability and modularity of the machined profiles.

WORKit has a total of 5 different profiles that function as wall anchors, with lengths of 600,1000,1600, 2000 and 2600 (mm), and 13 accessories with widths of 360 or 720 (mm), anchored together by means of steel bolts. It enables the creation of an endless list of possibilities for work and storage furniture.

The competition prizes were awarded to the winner and two finalists on 23 September 2022 during the HabitatFair, which took place from 20-23 September 2022 in Valencia. iPRODUCE partners AIDIMME and Océano Naranja were present at the fair representing iPRODUCE and delivering the awards.


Workit by SALVA CABALLERO, INNOVAMOBEL winning project

September 7, 2022 Cristina Revert news , Innovamobel contest , project diffusion , iPRODUCE , workit

Furniture product design competition of the iPRODUCE project.

Salva Caballero, a Valencian product designer, has won first prize in the INNOVAMOBEL contest promoted within the framework of the iPRODUCE project , with his Workit project. It has been the best candidacy of those presented, obtaining a score of 17.27 points out of a total of 23 possible, standing out in most of the valued aspects, especially in the level of concept development, project status, innovation motivation and quality, of the project.

Workit is a set of accessories and modular profiles that allows us to create an infinite number of work and storage spaces.

Salva Caballero, Valencian designer

Figure 45. Spanish Open Competition #2 Winner


Sketch 2 Workit: work kit (Salva Caballero)

Sketch 3 Workit: storage kit (Salva Caballero)

Figure 46. Spanish Open Competition #2 Winner - Final Product

Figure 47. Spanish Open Competition #2 Winner - Final Product (2)

Figure 48. Spanish Award Ceremony - Open Competition #2 Winner

Seica (Finalist)

Seica is a modular kitchen reduced to its minimum expression that seeks to optimise the workspace. Seica is designed for dynamic small spaces with multiple possibilities.

Figure 49. Spanish Open Competition #2 Finalist

Evolutionary children's furniture (Finalist)

Evolutionary children's furniture is a project with five different possibilities, including sleep, relaxation and rest, child protection and safety, hygiene, and baby care and transport on wheels.

Figure 50. Spanish Open Competition #2 Finalist

3.5 Analysis and further considerations

Considering the participation, engagement and results of the second competition, one main conclusion stands out: having organised local competition activities and widening the scope of the challenges, with the concept fully aligned with the iPRODUCE project objectives, generated greater interest, more participation, and better contributions to the project. This has led to a positive impact of a wide participation with a reservoir of talent.

The cMDF partners allowed for flexibility when it came to designing the challenges, including the type of entries eligible to participate in the competition. The competition prizes were also defined clearly which proved to be appealing and motivating to invite potential applicants. There was transparency and clarity on how the prizes would be made available and how the winners would be able to participate in the project.

The main takeaways from the Greek cMDF competition include:

- Satisfactory workshop attendance.
- Participant familiarisation with iPRODUCE goals, concepts, and ideas.
- Knowledge sharing and discussion encouragement based on project implementation.
- Collaborative testing and training of local communities to use the iPRODUCE digital platform, gathering feedback on user experience and usability.
- Raising awareness among stakeholders, makers, etc. about digital manufacturing, co-design and initiating co-creation activities.
- Enhancing design by integrating 3D printing and AR/VR technologies.
- Increasing the impact of dissemination activities to promote the achievements of iPRODUCE project and seek for additional exploitation opportunities.

The Italian cMDF competition having been launched locally allowed it to more easily reach the local targeted beneficiaries. In fact, the use of a local platform to collect the proposals, the use of Italian language for the promotion of the challenge and for the submission of the proposals helped the organisers to collect more projects. Unfortunately, at that time the OpiS platform was still in development so a webinar on the OpiS future functionalities was organised. The participants were asked to “imagine” which kind of tools could have helped their project and how they would have used them in the future. With regard to the prizes, the support services from the Italian cMDF were greatly appreciated by the participants, more so than the gadgets.

From the perspective of the French cMDF, the iPRODUCE mobility challenge was fascinating as it revealed a strong desire for collaborative platforms and tools. The projects submitted for the challenge were all very interesting, making it a challenging task to select the winners. However, one of the obstacles encountered was the unavailability of the tools and platform for the participants. Despite the initial plan to support the development of their ideas using the OPis platform, this was not possible at the time of the competition.

The German cMDF expressed that the local competition attracted some exciting projects. It was better to have a more open approach as opposed to the narrowly defined challenges compared to the first competition. It gave the opportunity to showcase the project to a more heterogeneous target group with the competition easier to promote as a local competition which is more transparent and tangible for the participants. Furthermore, it was easier to explain procedures and objectives.

The Spanish cMDF was happy with the projects presented. The winner had the possibility of materialising a prototype, hand in hand with the cMDF, and with the most appropriate technology, always

receiving support and advice in the FabLab VLC. The materials and processes, as well as the advice for the realisation of the prototype are a direct part of the award. The winner received recognition of the prize and visibility through the dissemination channels of AIDIMME and VLC, in a sector magazine and iPRODUCE social media. The participants appreciated the iPRODUCE´s merchandising that was given to them and even though the OpIS platform was not fully functional, they contributed many ideas that have been taken into account for the current development of the platform.

In conclusion, the second cMDF competition showcased the benefits of organising local competitions and widening the scope of challenges in line with the iPRODUCE project objectives. This approach resulted in increased interest, greater participation, and more valuable contributions to the project. The flexibility in designing the challenges and defining clear prizes proved to be appealing and motivating to potential applicants. The main takeaways from the Greek, Italian, French, German, and Spanish cMDF competitions include various positive outcomes such as workshop attendance, familiarisation with iPRODUCE goals, knowledge sharing, collaborative testing, raising awareness, enhancing design, increasing dissemination impact, and seeking additional exploitation opportunities. However, some challenges were encountered, such as the ongoing development of the OpIS platform. Overall, the local cMDF competitions fostered engagement, talent reservoirs, and fruitful collaborations, contributing to the success of the iPRODUCE project.

4 Open Competition #3 - Hackathon

4.1 Competition framework

The main objective of the iPRODUCE hackathon was to contribute to the validation of the iPRODUCE value proposition, particularly the OpIS platform and respective tools.

4.1.1 Objectives

The objective of this competition was for participants to explore the iPRODUCE OpIs platform and tools to unleash their creative potential to develop a product idea.

Participants in the hackathon were able to participate individually or in teams of up to three people, which were already established before the hackathon started. Individuals/ teams had the possibility to develop any type of idea/ solution, focusing on any type of sector.

Each CMDF partner and F6S were tasked with recruiting at least five teams/ individuals to participate in the Hackathon, as a route to securing at least 30 participants and bringing teams in locally.

The cMDF partner representatives played an important role in the hackathon, acting as fictitious actors/ stakeholders that the teams were able to interact with at the different cMDF locations or online to get information and request specific support.

A Technical 'Hackathon Support Team' was also set up to support any questions/ issues identified by the participants. This team was composed by F6S staff, Technical Developers and cMDF representatives. The team was on standby via a Zoom meeting that ran from 20 to 22 of April and during the working hours (from 9:00 to 17:00). In addition to the Zoom meeting, a Telegram group was created to facilitate further networking among the participants and for them to help each other during the hours that no one from the support team was online. Telegram was selected as it allows the organisers to invite people to a group using a "link to the group" option that was sent via email to the participants. This way, personal details being shared was limited with the organisers of the hackathon and with other participants. Telegram also prevents any type of personal information being seen between group members, other than the participant name for which consent was received.

It was expected that the hackathon and diversity of products conceptualised and developed by the teams contribute to demonstrate the full potential of the OpIS platform. Simultaneously, as products were developed, individuals/ teams were encouraged to identify any bugs or define improvements, which would result in bonus points at the end of the hackathon.

Ahead of the Hackathon and to support participants with the tools, a pocket guide (Figure 51) was created to help them get started.

Figure 51. iPRODUCE Hackathon Pocket Guide

4.1.2 Challenges

The main challenge of the iPRODUCE Hackathon was for teams/ individuals to develop a product idea by creating their own user journey by using as many of the OpIS tools as possible to develop their product. Individuals/ teams were invited to develop any type of idea/ solution, focusing on any type of sector.

4.1.3 Requirements

The registrations officially opened on 8 March 2023. Participants interested in taking part in the Hackathon were required to complete their registration online to secure their place. The registrations closed on 18 April 2023, 2 days before the Hackathon start to allow enough time to receive a sufficient number of registrations and to take care of logistics.

Participants were also required to submit a product profile form describing their developed product in more detail, the OpIS tools used, and submission of images and videos of their developed product. Feedback and testimonials were also collected.

4.1.4 Timeline

- For participants who joined the Italian or Spanish cMDF, activities ran from Thursday, 20 April, 9h00 CEST to Friday, 21 April, 14h30 CEST *(only for the Spanish cMDF)*. The Italian cMDF hackathon activities ended at 17:00 CEST.
- For participants who joined the French, German or Greek cMDF, activities ran from Friday, 20 April, 9h00 CEST to Saturday, 22 of April, 14h30 CEST.

- For participants who joined online, these were able to join at any time starting from Thursday, 20 April, 9h00 CEST until Saturday, 22 April, 14h30 CEST. All registered online participants were given access to an online hackathon room.

Figure 52 represents the overall timeline of the iPRODUCE Hackathon activities, running from 20 April to 22 April.

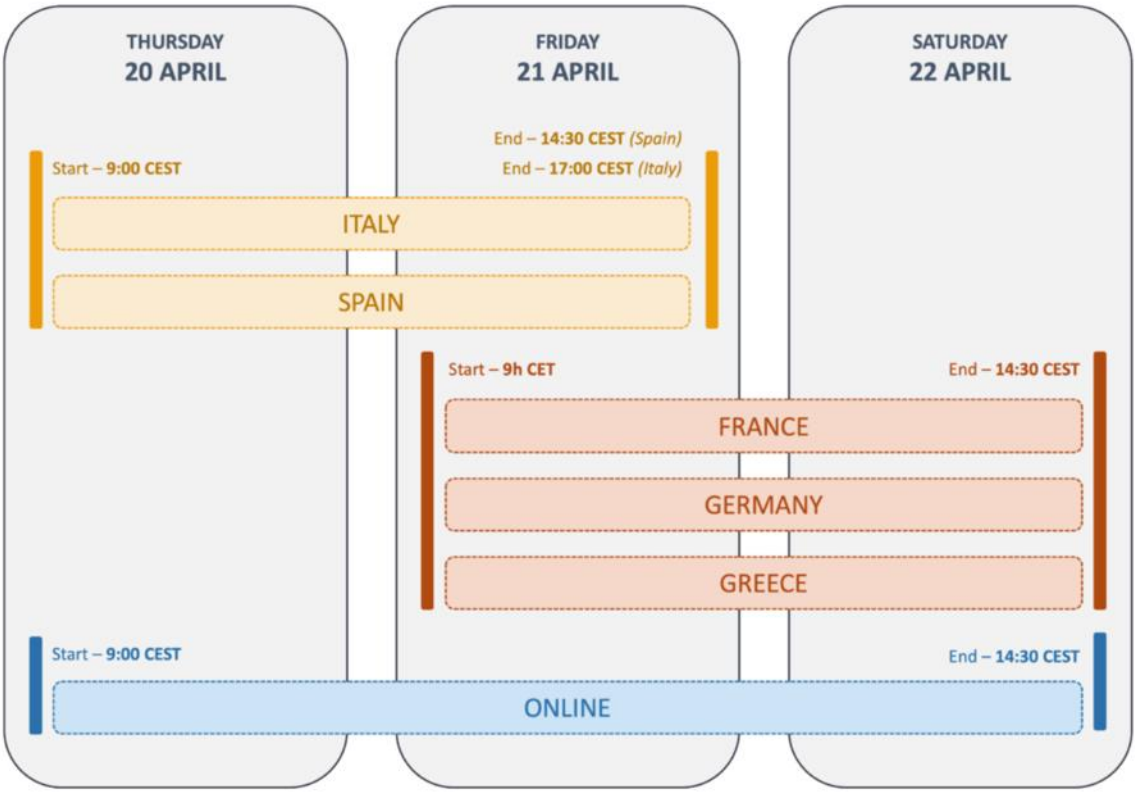


Figure 52. iPRODUCE Hackathon Agenda

The hackathon was a non-stop activity, and the cMDF facilities were open during daytime hours only (9h00 CEST to 17h00 CEST).

4.1.5 Format & organisation

The hackathon was organised as a hybrid event, open to participants from any EU Member State and any H2020 Associated Countries. The participants were able to participate either in-person at one of the cMDF locations (Table 7) or fully online. This ensured flexibility and participation from a wider representation allowing the opportunity to share, collaborate and develop ideas across different countries. cMDF partner representatives were present at the various locations as well as online during the 'Hackathon activity' hours as a first point of contact to present, support any issues, clarify any questions and connect with the Technical support team as and when necessary through the online Zoom link.

Table 7. iPRODUCE Hackathon cMDF Locations

cMDF	cMDF Hackathon Location
French cMDF	**FabLab Vosges** 15 rue du Petit Saint-Dié 88100 Saint-Dié-des-Vosges (France) **Excelcar** Route de Nantes 35131 Chartres de Bretagne (France)
German cMDF	**Makerspace Bonn e.V.** Kennedyallee 18 53177 Bonn (Germany)
Greek cMDF	**OK!Thess** Komotinis 2, 54655 Thessaloniki (Greece)
Italian cMDF	**ProM Facility** % Polo della Meccatronica Via Fortunato Zeni, 8 38068, Rovereto (TN) (Italy) **FabLab UNITN** Via Sommarive, 9 38123, Povo (TN) (Italy) **Energy @ Work** Via Marina del Mondo 62 70043, Monopoli (BA) (Italy)
Spanish cMDF	**CIPFP (Catarroja Public Integrated Center for Vocational Training)** C/ San Vicente Ferrer, 1-Bis. 46470 Catarroja (Valencia) Spain

By delivering this event in a hybrid format, it was possible to increase the reach, allow for flexibility and gain more attendees, allowing participants who were not able to attend at any of the physical locations to still be able to participate in the Hackathon online. This has enabled a greater networking opportunity with a wider pool of attendees connecting with each other even if they were not in the same room, creating two channels of engagement.

The general approach for the hackathon was:

- Welcome, introduction to the hackathon and providing an overview of the rules.
- Hackathon activities.
- Presentation of product, completion of product profiles and announcement of winners.

The Hackathon had one main event team, which was managed by F6S and the cMDF partners. The team was dedicated to the participants attending the event onsite at the various locations as well as

those participating online. The main team and the technical team who were responsible for the platform and the tools were in constant communication with each other throughout the planning, set up process and delivery to ensure a smooth delivery of the event.

In total 56 registrations were received to participate as a team for the iPRODUCE Hackathon. Table 8 provides a table breakdown of team registrations received to attend at each cMDF location as well as online.

Table 8. iPRODUCE Hackathon team registrations

cMDF	Number of Registrations
France	2 - French cMDF (FabLab Vosges)
Germany	6 - German cMDF (Makerspace Bonn e.V.)
Greece	6 - Greek cMDF (OK!Thess)
Italy	6 - Italian cMDF (FabLab UNITN) 2 - Italian cMDF (Energy @ Work) 3 - Italian cMDF (ProM Facility of Trentino Sviluppo)
Spain	11 - Spanish cMDF (Catarroja Public Integrated Center for Vocational Training)
Online	20 - Online

Although the majority of registrations received were to participate online, it was only possible to consider 44 as being eligible to participate and receive the prizes. It is interesting and important to note that 12 registrations were received from outside eligible countries, with some registrations coming from the USA and African countries.

The coverage of the Hackathon was exposed and increased reach in other parts of the world through the various routes of communication and dissemination activities carried out and by delivering this event in hybrid format which boosted higher engagement.

The iPRODUCE Hackathon was able to gain interest from non-EU registrants on what was happening on the project and how they could be part of this competition which is valuable data and gives insight into the project outreach.

While the Hackathon at the local cMDFs was important, going hybrid was a great way to accommodate attendees with their personal carbon footprint. This way, they were still able to take part in the event and enjoy it, while also doing their part to decrease carbon emissions bridging the gap between costs and results.

On day one of the Hackathon, F6S organised a welcome introduction for all participants with a speech from the Project coordinator (Manuel Sanchez) and the F6S Project Manager (Mirana Khanom) followed by a presentation by F6S Communication Manager (Marina Domingas) covering the Hackathon rules, concept, agenda, tools, available resources, forms to complete prizes and the support available. Following this, the Hackathon activities commenced for the Spanish and Italian cMDFs as well as the

online teams until 17:00 (CEST). Participants had the option to work beyond this time if they wanted to, but would only receive out of hours support from other participants through the Telegram app.

Figure 53 depicts the welcome session in the morning of 20 April with all participants and cMDFs joining locally as well as the project partners and online participants.

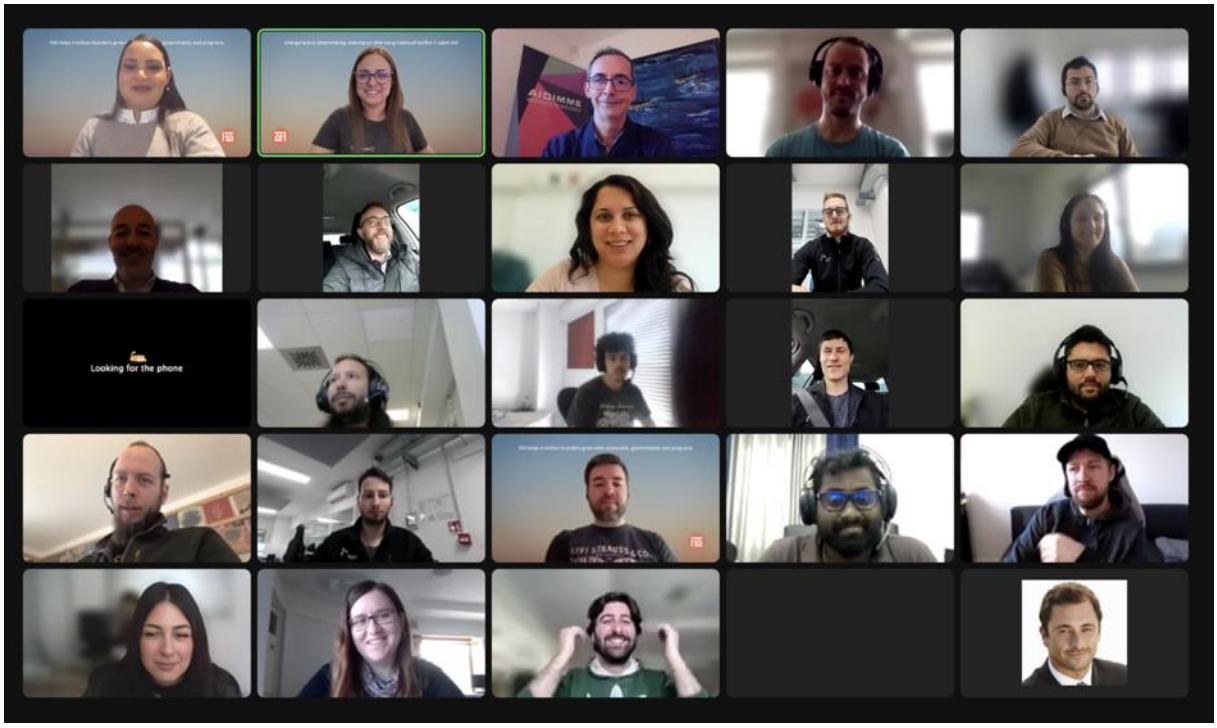


Figure 53. iPRODUCE Hackathon Day 1 Zoom Introduction Session

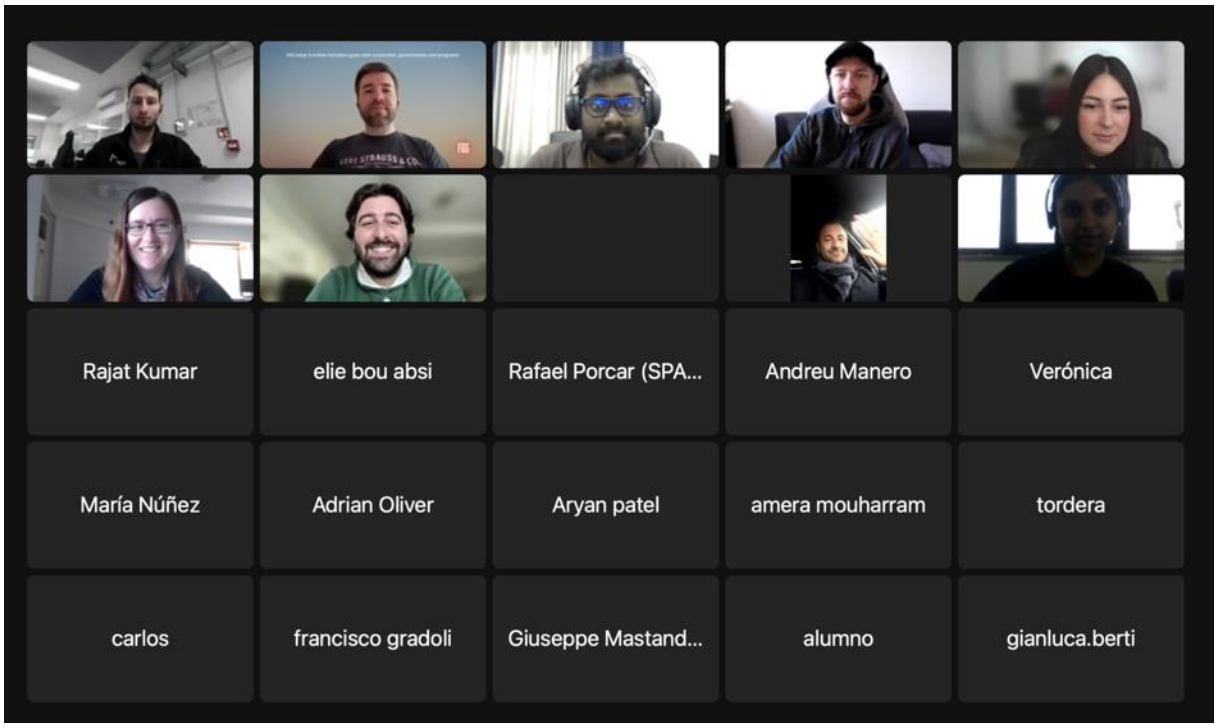


Figure 54. iPRODUCE Hackathon Day 1 Zoom Introduction Session (2)

As Figure 55 shows, throughout the day both the local and online participants were engaging very well through the Zoom link by asking questions, requesting support and presenting any issues live which allowed for cMDFs, the technical team and F6S to answer these promptly, and also share with other teams who were online that may have had a similar request.

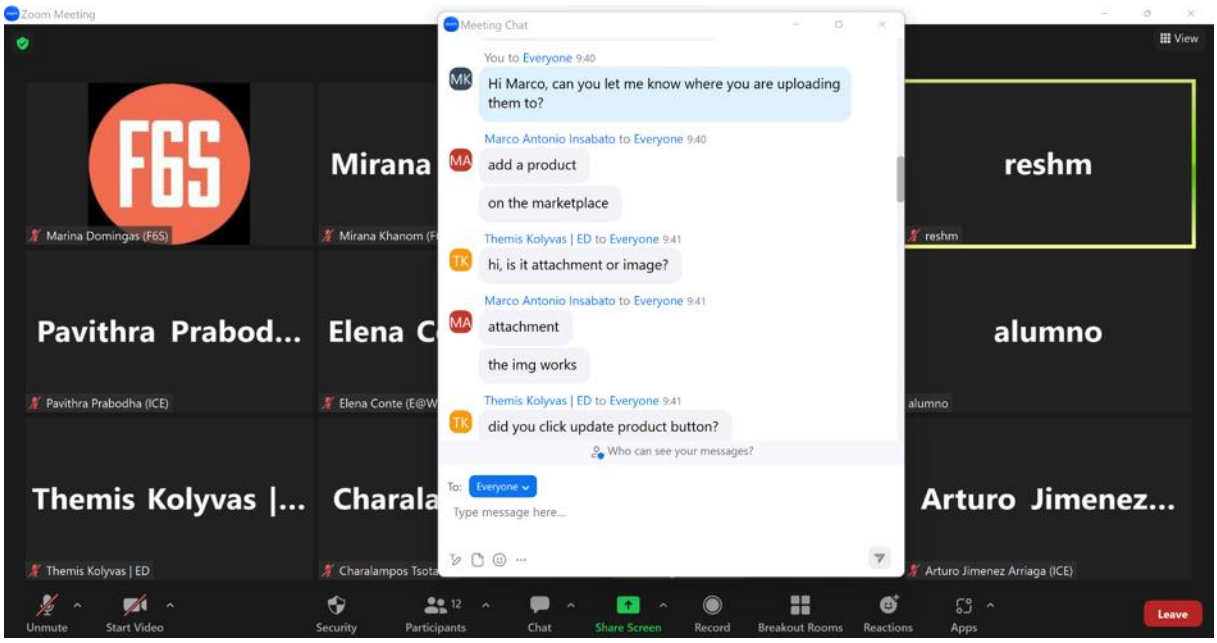


Figure 55. iPRODUCE Hackathon Online Engagement with Technical team

The second day of the Hackathon started with a welcome introduction for participants joining from the French, German, Greek cMDFs, including a speech from the Project coordinator (Manuel Sanchez) and

the F6S Project Manager (Mirana Khanom) followed by a presentation by F6S Communication Manager (Marina Domingas) covering the Hackathon rules, concept, agenda, tools, available resources, forms to complete prizes and the support available.

Figure 56 depicts this session in the morning with all participants and cMDFs joining locally as well as our project partners and online participants.

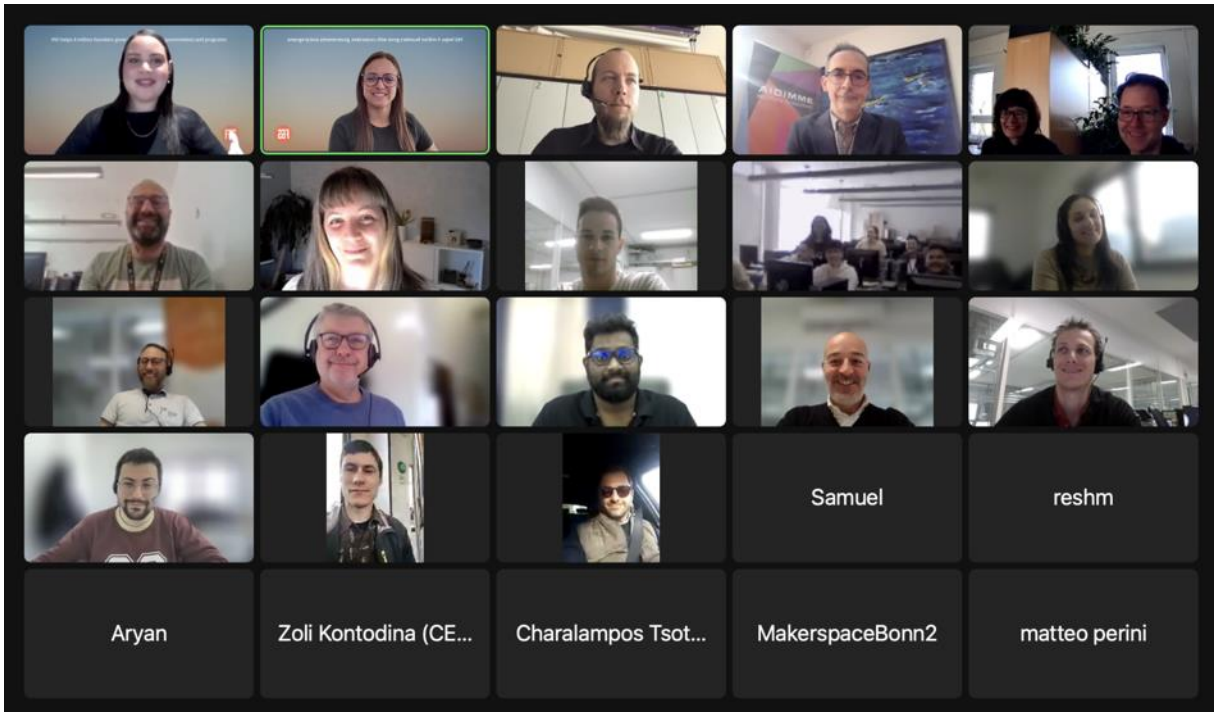


Figure 56. iPRODUCE Hackathon Day 2 Zoom Introduction Session

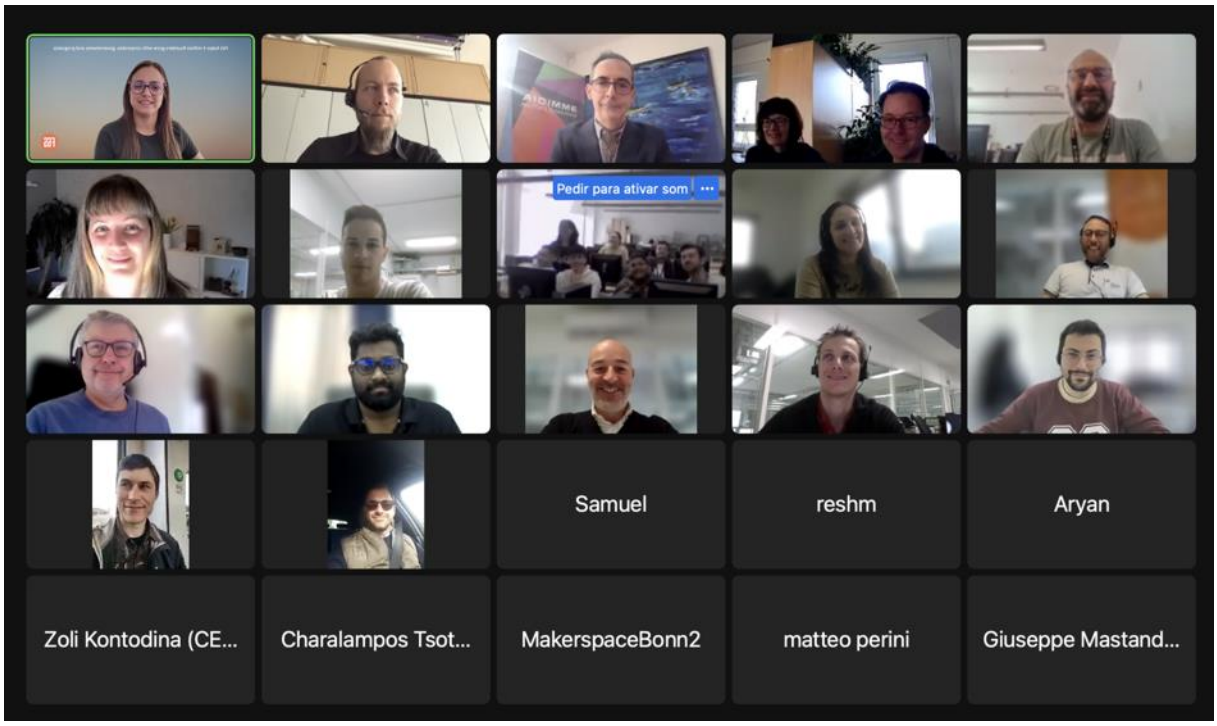


Figure 57. iPRODUCE Hackathon Day 2 Zoom Introduction Session (2)

Following this, the Hackathon had a Keynote speaker, Dr. Vanessa Julia Carpenter, PhD who presented and talked about illutron, GeekPhysical, Copenhagen Grotesque Burlesque, IdemoLab and Kintsugi Design, places that are using prototyping which are part of the maker movement. Vanessa shared her relatable extensive experience and knowledge in creating impactful and meaningful interactions with technology, including over 40 examples in a rapid-fire format with considerations for how to design for meaningful interactions with technology in a quick way using the classic IDEO prescription of “Right, Rapid, Rough.”

Figure 58. iPRODUCE Hackathon Speaker Promotional Material

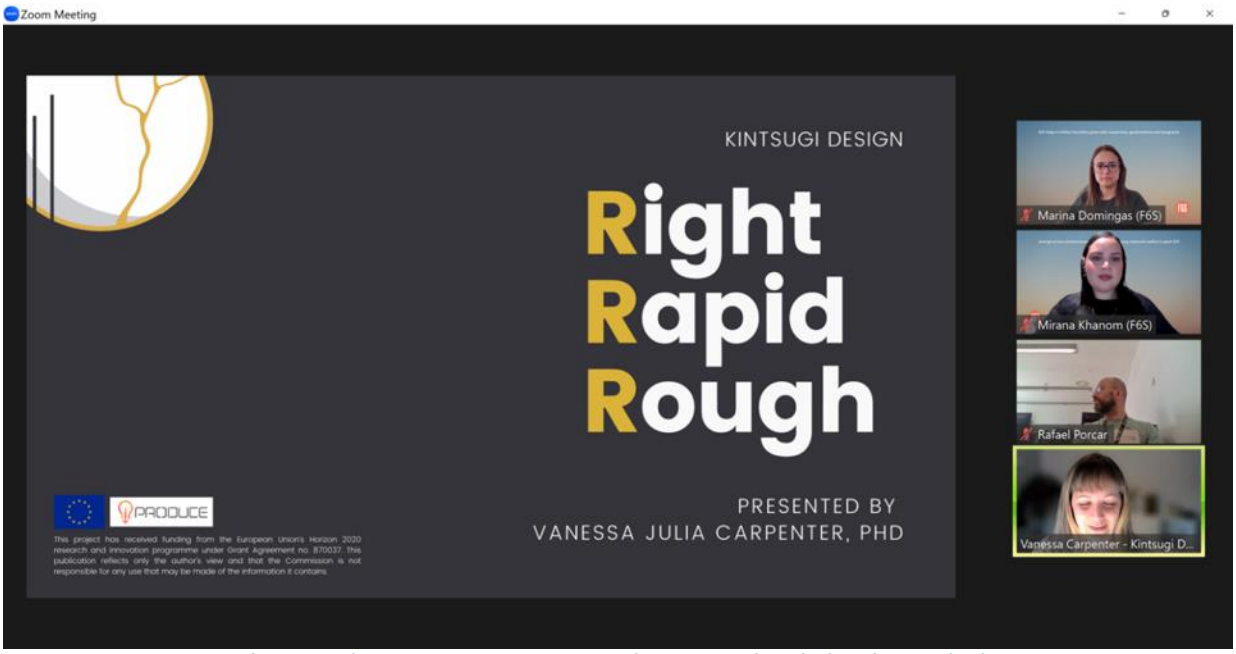


Figure 59. iPRODUCE Keynote Speaker presenting during the Hackathon

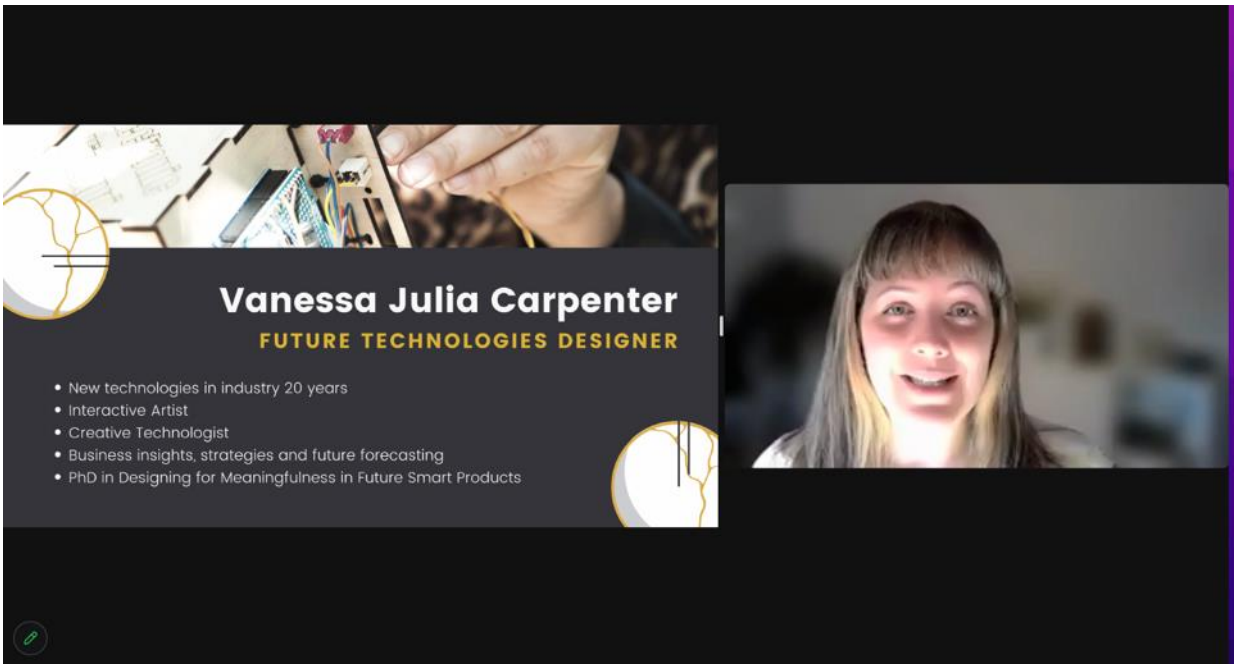


Figure 60. iPRODUCE Keynote Speaker presenting during the Hackathon (2)

Subsequently, the hackathon activities commenced for the French, German and Greek cMDFs, and continued for the online teams that started the day before. For the local Italian and Spanish teams, activities continued up to 14:30 (CEST) with the hackathon closing at the end of the day.

Pictures taken during the hackathon activities at the local cMDFs can be found in Annex A.

Once the hackathon activities had finished for all the local cMDFs and online participants, the pitching sessions started. Each team was required to present their product to the judging panel at the local cMDFs and was done using any means that the team preferred, e.g. short video, presentation, showing things directly on the OpIS. The presentation of products was weighted at 25%, with only 2-3 minutes

to pitch, so teams were asked to ensure they were well prepared, creative, and efficient. A non-negotiable time limit was set up so that all teams had equal opportunity.

As and when each pitch was being delivered, the judging panel concurrently were scoring through a pre-defined submission form. Pitches covered the solutions introduced, any problems encountered, the tools leveraged and any lessons learned. Results of the scores were sent automatically to the F6S team who reviewed and compiled the scores who sent details of each of the winners ahead of the award ceremonies.

This approach was taken to ensure greater independence in scoring and avoid introducing biases into the process. This process enabled the organising team to have full control, be time efficient and transparent. The number of bugs/improvements reported by teams was also added to the team's final scores at this stage.

Hackathon teams were scored by the judging panels using the scoring form (Figure 61. iPRODUCE Hackathon - Scoring Form) and by following the five different awarding criteria:

- **Criteria 1 (Weighting - 15%) - Innovativeness and creativity of results/ Wow Factor**

  We celebrate innovativeness and creativity! Has the team/ individual come up with an idea for a project that sounds exciting and challenging to tackle (Especially in a 3 day period)? Perfect.

- **Criteria 2 (Weighting - 30%) - OpIS Tools Leveraged**

  Has the project been able to use multiple tools and to what extent? Mark the tools that the participants were able to successfully use. The tools points are:

  - Marketplace - 1 point

  - Matchmaking - 1 point

  - IPR Authoring Tool - 2 points

  - Agile Data Analytics and Visualisation Suite - 2 points

  - AR/VR Toolkit - 3 points

  - Mobile Application – 2 points

- **Criteria 3 (Weighting - 15%) - Transferability of results**

  Has the project been able to demonstrate transferable results which can be used in the future or in the market?

- **Criteria 4 (Weighting - 25%) - Presentation of results/ Informative Demo**

  The team/ individual will have 2/3 minutes to present their results/ product live or via their product profile and cogently and concisely tell us about any problems encountered, the solutions introduced, the tools leveraged, and the lessons learned. Has this criterion been fulfilled?

- **Criteria 5 (Weighting - 15%) - Completeness of results/ Execution**

  To what extent did the team/ individual successfully execute upon the project concept over the course of the 3-day event?

Tie-breaker criteria:

Tiebreaker criterion was also included in the instance of two teams tied with their final scores. The winner out of these two teams was selected with consideration taken for the team who scored highly in the evaluation criteria in the following order:

1. OpIS Tools used in developing the solution
2. Presentation of results/ Informative Demo
3. Innovativeness and creativity of results/ Wow Factor
4. Transferability of results
5. Completeness of results/ Execution
6. Highest number of bugs/improvements reported

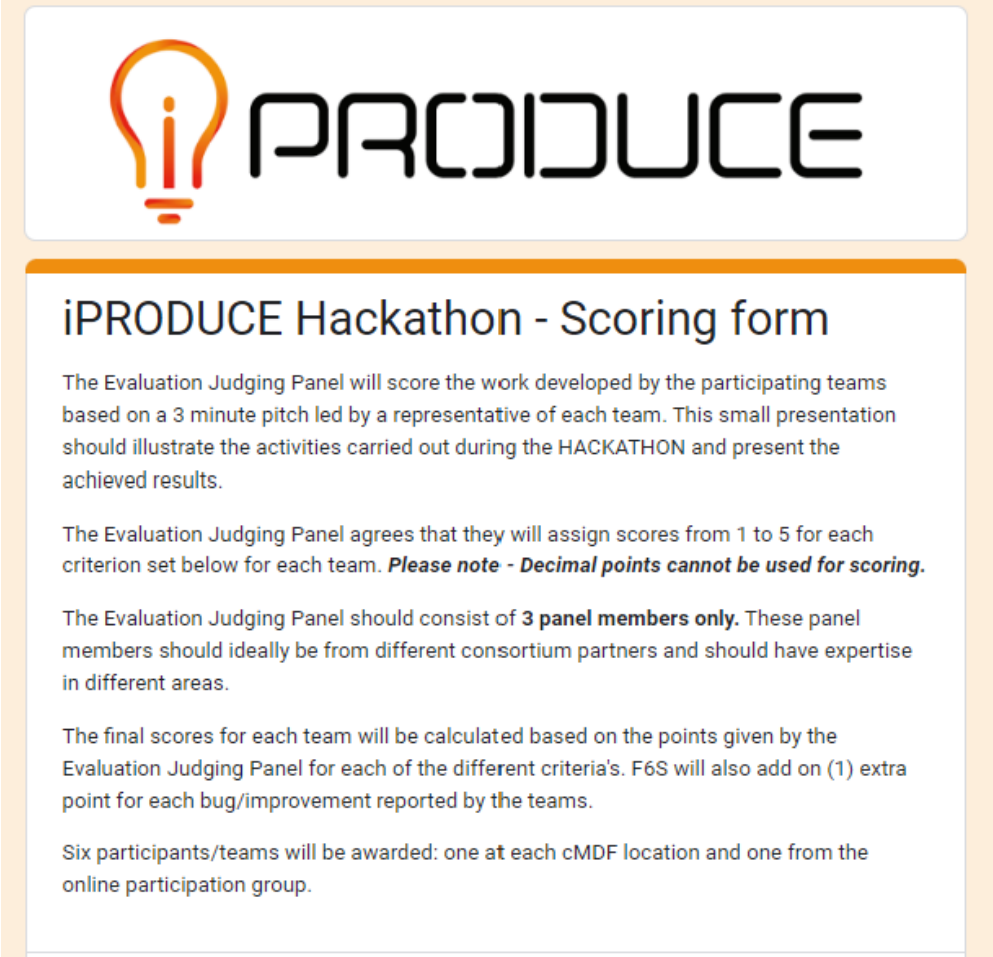


Figure 61. iPRODUCE Hackathon - Scoring Form

As part of the wrap up process, all participants/teams were required to submit a product profile via a dedicated form, which contained information about the developed product, experience and perspective of the Hackathon and feedback of what has and hasn't worked well.

Within this form, participants were able to attach supporting documents such as images or videos demonstrating what they had produced.

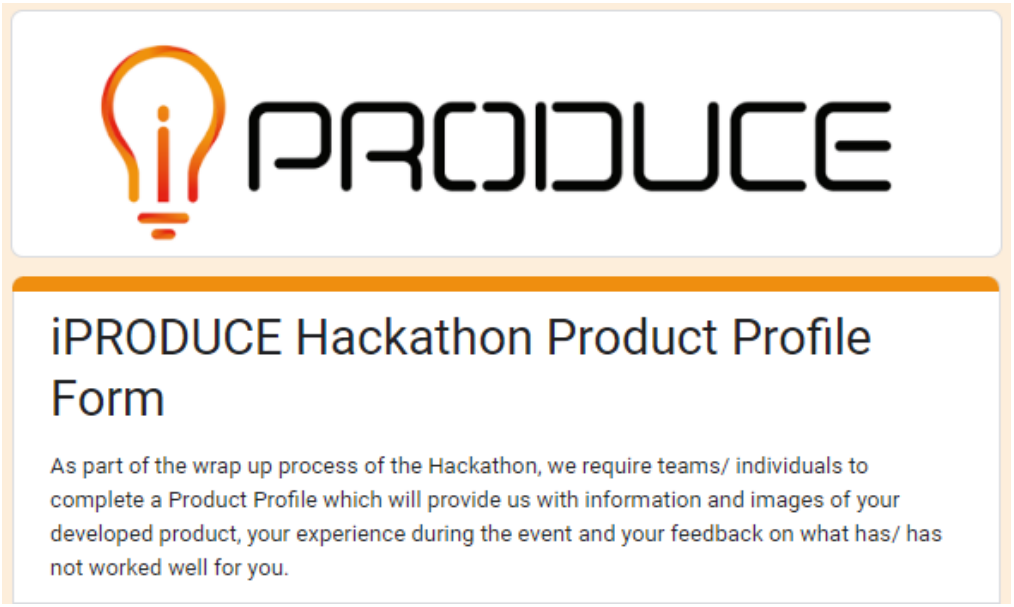


Figure 62. iPRODUCE Hackathon Product Profile Form

It was decided that one winner per cMDF (5) and online participant (1) would be awarded with the prizes lined up for the Hackathon, with a total of 6 winners.

The Hackathon competition was designed to offer the awarded participants with support in the form of technical assistance, mentoring, and visibility at each of the local cMDFs as well as for the online participants. The 'Hackathon Support Team' which included staff from F6S, the technical developers and cMDFs were also on standby whilst the Hackathon activities were taking place to support any questions/ issues that arose. The online Zoom meeting was running during Hackathon activities, for participants to network and share any questions they had, with these being answered live.

We also set up an online messaging platform called 'Telegram', which enabled participants to join the 'iPRODUCE Hackathon group' to interact and network with each other despite where they were participating from. This proved to be a valuable tool as it provided a level of interaction and gave everyone the same opportunities.

In the framework of this competition, the following prizes were awarded to the winners:

- Featured in a high-visibility magazine article called the 'Manufacturing Engineering Magazine' that will be focused on the winning products and their work during the Hackathon. These would also be featured in the newsletter, which goes out to 40,000 enrolled members.
- Showcased the winning products in videos across the iPRODUCE network and social media channels

The Manufacturing Engineering Magazine, would also include a sole article just on the iPRODUCE project covering what the project is all about and achievements.

Figure 63. iPRODUCE article on Manufacturing Engineering Magazine

Merchandise and lunch was also provided at some of the physical cMDF locations. Merchandise was also sent to the online winner.

Figure 64. iPRODUCE Hackathon Spanish cMDF Merchandise

Figure 65. iPRODUCE Hackathon Online Participation Merchandise

4.2 Promotion activities

The Hackathon was promoted through various channels such as the project website (Figure 66), F6S event page (Figure 67), Eventbrite (Figure 68), LinkedIn event (Figure 69), and Twitter (Figure 70) and project partners.

The event promotion was one of the most important aspects of this competition, to ensure awareness amongst the project's target audience was created and generated enough interest to attract as many attendees as possible for the Hackathon.

All promotion efforts demonstrated what the event was about and what we it was offering, with clear messages and content to make this more appealing to the target audience. Adequate timing for the promotion was ensured, with a direct strategy in place to successfully implement the Hackathon goals.

A dedicated paid LinkedIn social media campaign was carried out for the Hackathon which proved to be effective. It resulted in increased awareness of the hackathon and the iPRODUCE project highlighting important event details, driving more visits to the project website, increase in engagement on social media content through likes, comments, shares and reposts.

Figure 66. iPRODUCE Hackathon screenshot of website

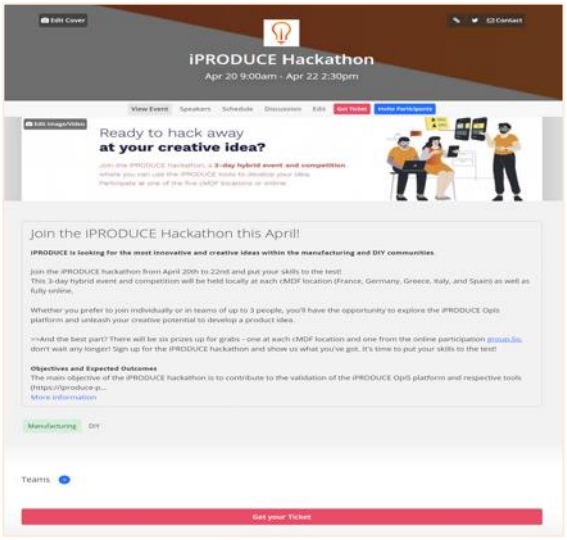


Figure 67. iPRODUCE Hackathon screenshot of F6S Event page

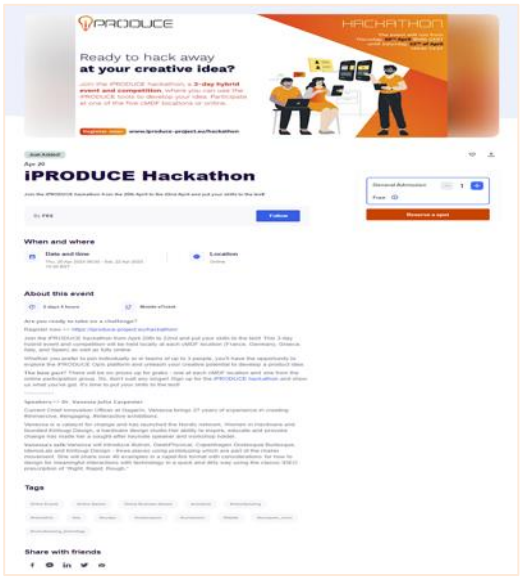


Figure 68. iPRODUCE Hackathon screenshot of Eventbrite page

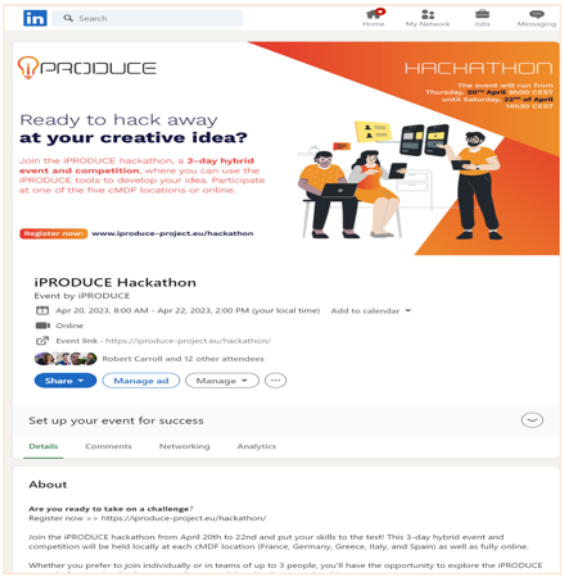


Figure 69. iPRODUCE Hackathon screenshot of LinkedIn Event page

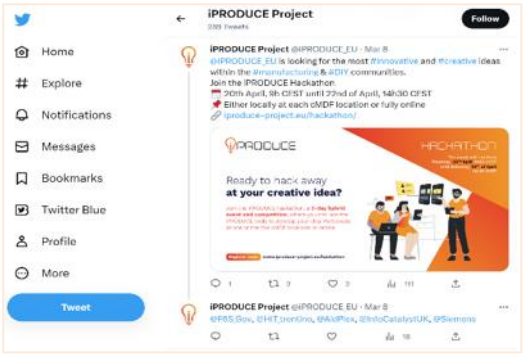


Figure 70. iPRODUCE Hackathon screenshot of Twitter promotion

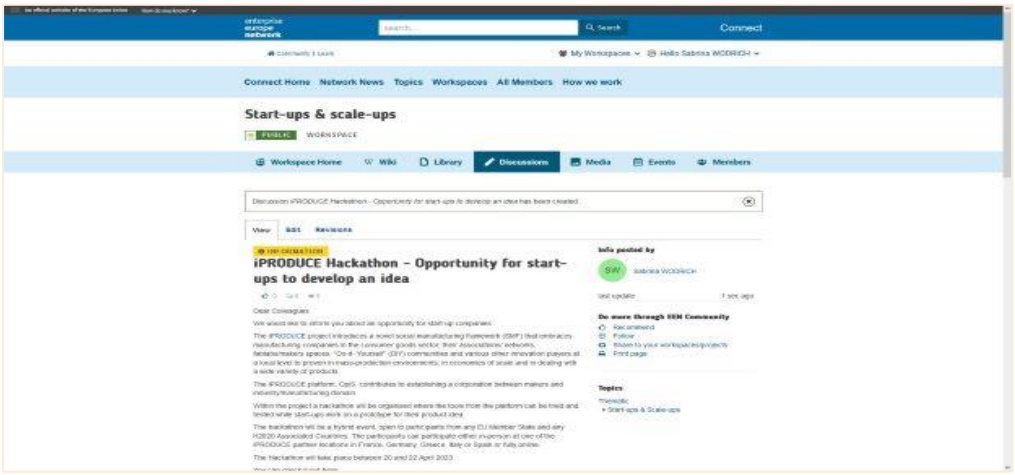


Figure 71. iPRODUCE Hackathon screenshot of message to Enterprise Europe Network

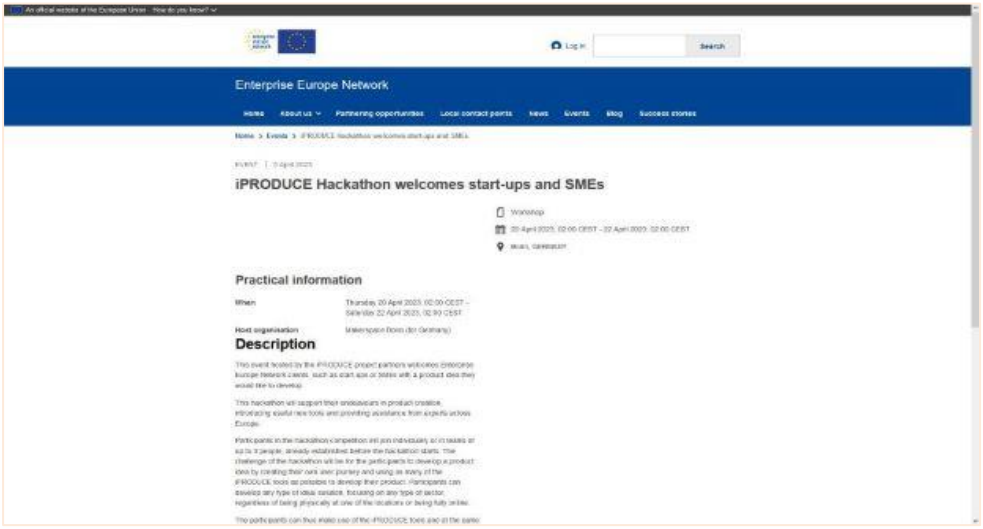


Figure 72. iPRODUCE Hackathon screenshot of promotion via Enterprise Europe Network

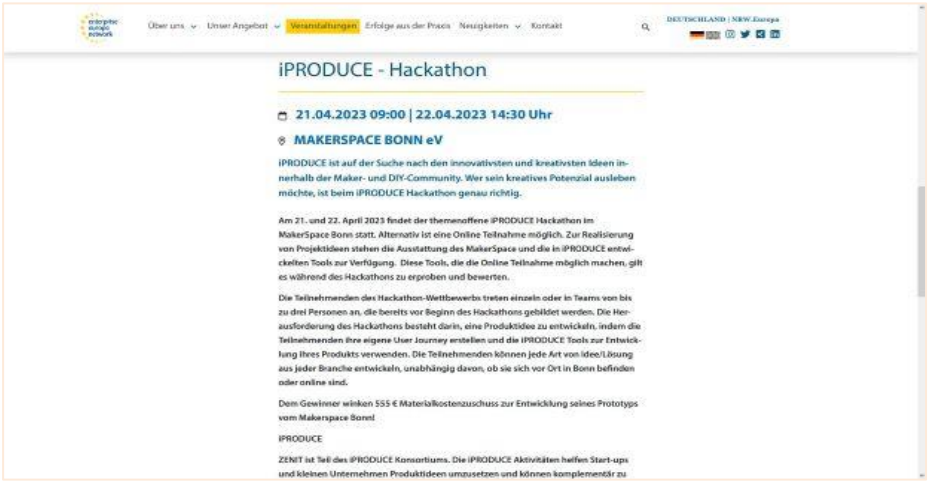


Figure 73. iPRODUCE Hackathon screenshot of ZENIT / NRW Europa website for German Hackathon

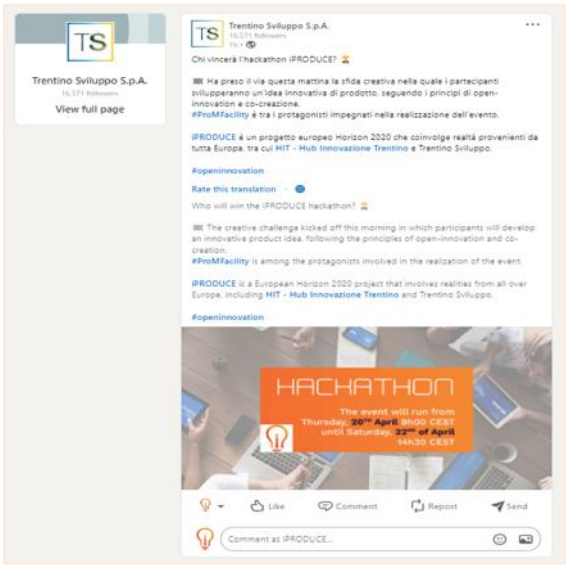


Figure 74. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (1)

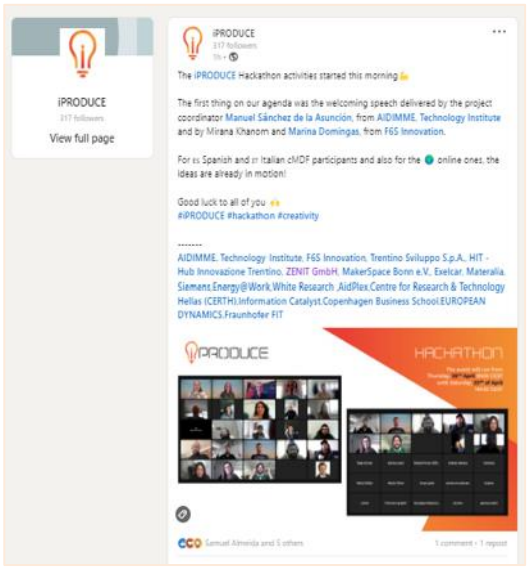


Figure 75. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (2)

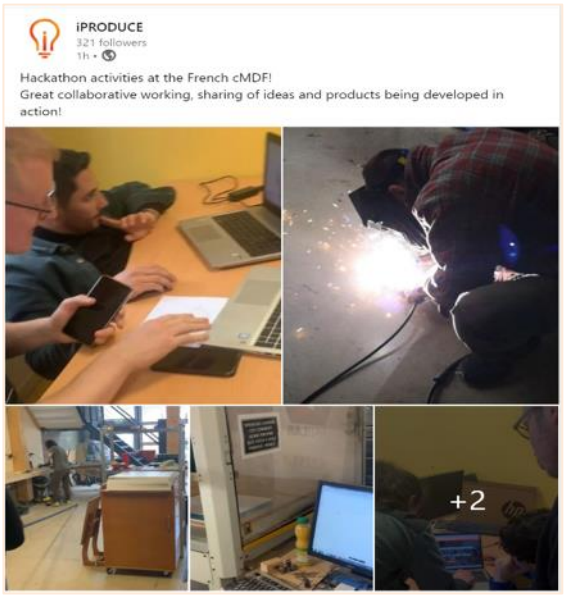


Figure 76. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (3)

Figure 77. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (4)

Figure 78. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (5)

Figure 79. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (6)

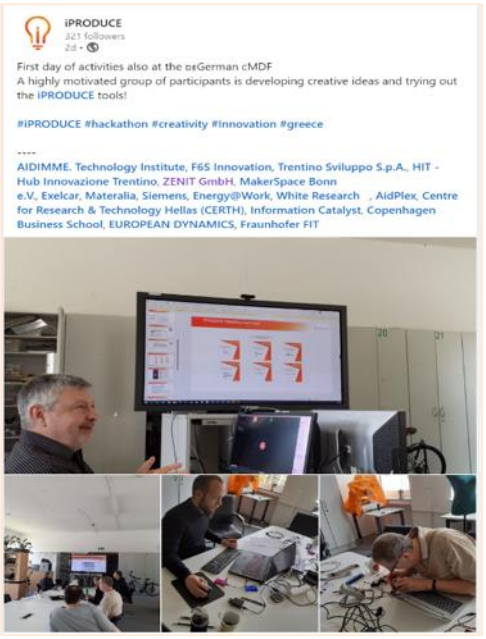


Figure 80. iPRODUCE screenshot of LinkedIn post of Hackathon in progress (7)

4.3 Results

The awarding was based on the quality of the idea/ product developed (conceptualised), the number of OpIS tools that were used to develop it, and extra bonus points were awarded based on bug reporting and improvements identified. Each team could receive an extra 2% per each bug / improvement reported, with up to a maximum of 10%.

iPRODUCE Hackathon
Bug/Improvements Reporting Form

Identifying bugs or potential improvements in the software you used during the hackathon will increase your final scoring.

We consider a bug to be something where you have encountered an unexpected problem in the software or the use of the tools (something that should work but it doesn't).

We consider an improvement to be something that functions correctly, but you have a suggestion that could work better.

For each bug that is identified or a suggested improvement, your team will receive 2% extra (up to a maximum of 10%) which will be added to your team overall score and provided to the Evaluation judging panel.

For points related to bugs/ improvements, the judges must be able to read your responses in the form quickly to understand the issue encountered and your suggested improvement. So please ensure that your responses are clear and understandable. You also have the option to attach a picture, in case it helps you explain the problem.

Figure 81. iPRODUCE Hackathon Bug/ Improvements Reporting Form

Table 9 breaks down the number and names of the teams who pitched their ideas to the panel of judges.

As with any event, a drop-off rate is always anticipated. There were some teams who were 'no-shows' from the start of the event and at the end of day one of activities, suggesting a lack of availability to participate and possibly the event not being what they envisioned it to be.

Also, some participants who initially registered to participate alone or in a team of up to of 3 decided to merge with other participants to form a group in order to be able to work more collaboratively and effectively to produce a final product to pitch to the judges.

Table 9. iPRODUCE Hackathon teams who participated in the pitching session

cMDF	Number and names of teams participating in the pitching session to judges
France	2 - la green TEAm and FabLabTeam
Germany	2 - Urban Gardening, Philipp Lategahn
Greece	5 - Electronics Group, Chalkidona, Monstera's Assistant, Thanasis Mpogatinis and Bird

cMDF	Number and names of teams participating in the pitching session to judges
	Feeder
Italy	4 - Tremendous Team, Reshma Penjerla, RioProM and CropCoders
Spain	3 - Los primos, black&white and The doubts
Online	2 - Balder & Bragi and KLON3D

F6S provided each cMDF partner with the details of the winning team and compiled details of the online winner ahead of the award ceremonies. F6S informed the online winner directly. Details of each of the winners are listed below.

Each of the winners were featured in the 'Manufacturing Engineering Magazine' as mentioned above in the Value proposition section. Images of these articles can be seen against each winning team along with their video which was shared through the iPRODUCE social media channels and the project website.

4.3.1 France

The six registered participants formed two teams of three people.

The first team "green TEAm" worked on creating a piece of furniture with some cardboard material, using the Pack&Strat Technology. This team paid particular attention on using the OpIS tools and reporting improvements.

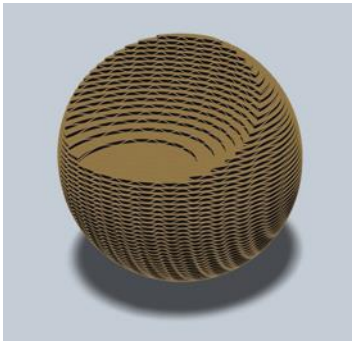


Figure 82. iPRODUCE Hackathon 'green TEAm' Final Product

Figure 83. iPRODUCE Hackathon 'green TEAm' Final Product (2)

On the other hand, the winning team "Fablab Team" developed a bicycle trailer that could be attached and adapted to any traditional bike. They worked simultaneously on both the Fablab and iPRODUCE tools creating a good product development flow. They used many iPRODUCE tools , reported some bugs, and had the most ambitious and idea driven product, and therefore were voted as winners. It should be noted that their product was 85% completed, so as a complementary prize, their product development will be fully supported by Fablab-Vosges and Excelcar.

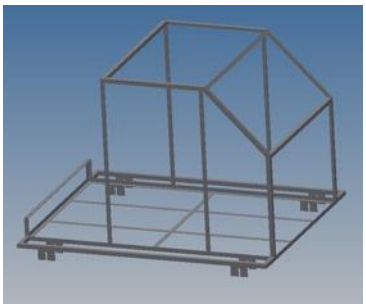


Figure 84. Winner of iPRODUCE Hackathon at French cMDF - Fablab Team

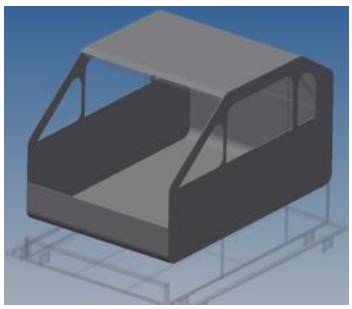
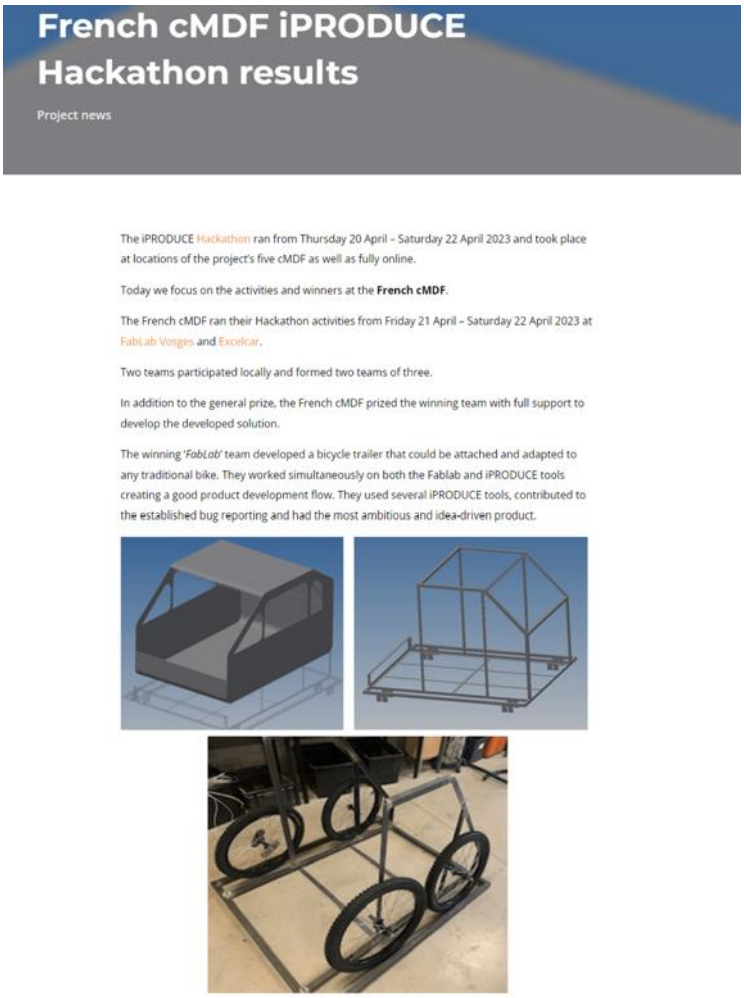


Figure 85. Winner of iPRODUCE Hackathon at French cMDF - Fablab Team (2)

Figure 86. Winner of iPRODUCE Hackathon at French cMDF - Fablab Team (3)



French cMDF iPRODUCE Hackathon results

Project news

The iPRODUCE Hackathon ran from Thursday 20 April – Saturday 22 April 2023 and took place at locations of the project's five cMDF as well as fully online.

Today we focus on the activities and winners at the **French cMDF**.

The French cMDF ran their Hackathon activities from Friday 21 April – Saturday 22 April 2023 at FabLab Vosges and Excelcar.

Two teams participated locally and formed two teams of three.

In addition to the general prize, the French cMDF prized the winning team with full support to develop the developed solution.

The winning '*FabLab*' team developed a bicycle trailer that could be attached and adapted to any traditional bike. They worked simultaneously on both the Fablab and iPRODUCE tools creating a good product development flow. They used several iPRODUCE tools, contributed to the established bug reporting and had the most ambitious and idea-driven product.

Figure 87. French cMDF Hackathon Winner News Piece on iPRODUCE website

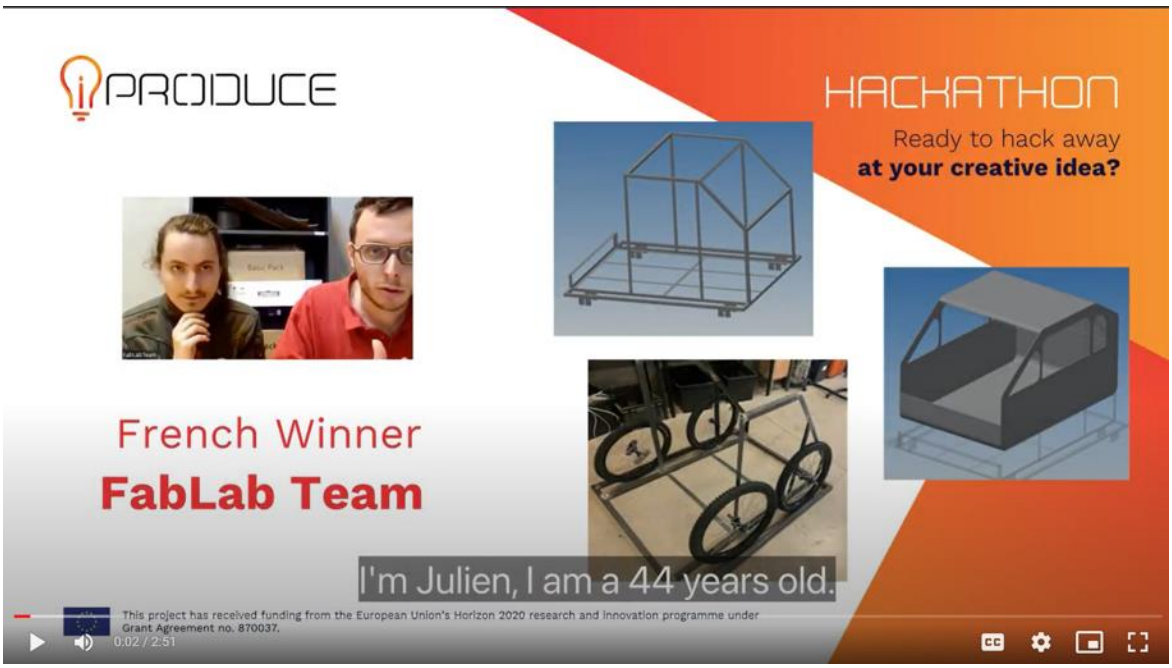


Figure 88. French cMDF Hackathon Winning Video

Figure 89. French cMDF Hackathon Winning Magazine Article

4.3.2 Germany

At the German cMDF, two teams participate locally. Initially, there were six registered teams, but three teams joined forces into one team called ‘Urban Gardening’. A second person - Phillip Lategahn - participated individually.

The Urban Gardening team designed an autonomous, solar powered, sensored self-watering high bed. This autonomous solar powered high bed allows for monitoring, watering and provides updates on status messages. By having these resources in place, it creates more efficiency and better growing and blooming of greens whether this is on a balcony or in a green space.

The sensor allows to measure the humidity of soil, gain results and turn the waterpump on if the soil is too dry. With this revolutionary technology, moisture levels can be monitored in the soil and water any greenery when it needs it the most, cultivating thriving gardens in cities, and breathing new life into barren lands making a real difference to the economy.

Phillip Lategahn developed a DIY RFID audiobook toy that is an innovative and interactive way to engage children in reading and storytelling. This toy allows children to record their own voices reading

their favourite books and then associate each recording with a unique RFID tag. When the RFID tag is scanned with the toy, the corresponding audio track will play, bringing the story to life. Not only does this toy encourage reading and language development, but it also enhances children's creativity and technological skills as they learn about RFID technology and how it works. With the DIY RFID audiobook toy, children can create a personalised and immersive reading experience that they'll love.

Despite Urban Gardening being initially declared the winner of the Hackathon, they declined the offered prizes, leading to the subsequent awarding of the prizes to Philipp Lategahn.

Figure 90. Winner of iPRODUCE Hackathon at German cMDF – Philipp Lategahn - Award Ceremony

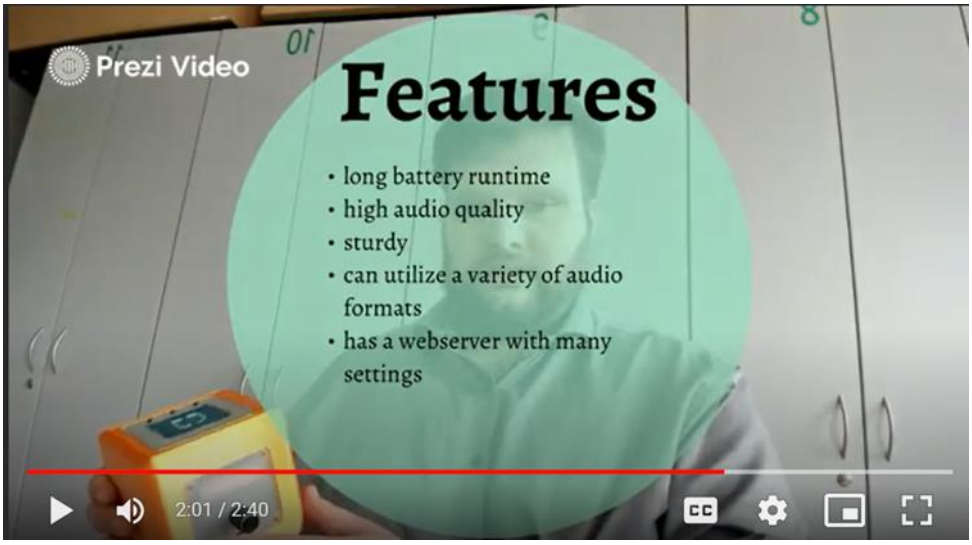


Figure 91. Winner of iPRODUCE Hackathon at German cMDF – Philipp Lategahn - Final Product

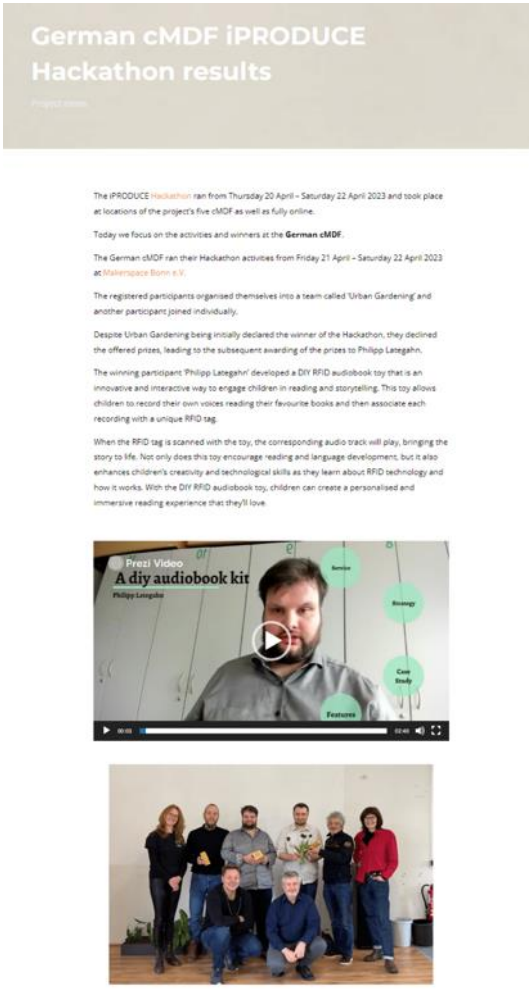


Figure 92. German cMDF Hackathon Winner News Piece on iPRODUCE website

Figure 93. German cMDF Hackathon Winning Video

Figure 94. German cMDF Hackathon Winning Magazine Article

4.3.3 Greece

The Greek cMDF hackathon activities were held at OK!Thess premises on 21 and 22 April 2023. Five teams develop and showcased their innovative ideas during the event, by utilising the OpIS platform tools.

The first team, “Electronics Group", composed of three members, presented an idea for a water bottle bike holder (Figure 95). The holder was designed to securely attach to a bike frame and hold a water bottle while riding. Their idea was based on a design from Thingiverse and the team used all the available tools of iPRODUCE platform (i.e., Marketplace, Matchmaking, IPR Authoring Tool, AR/VR Toolkit, Agile Data Analytics & Visualization Suite, and Mobile App) and reported a bug and some improvements.

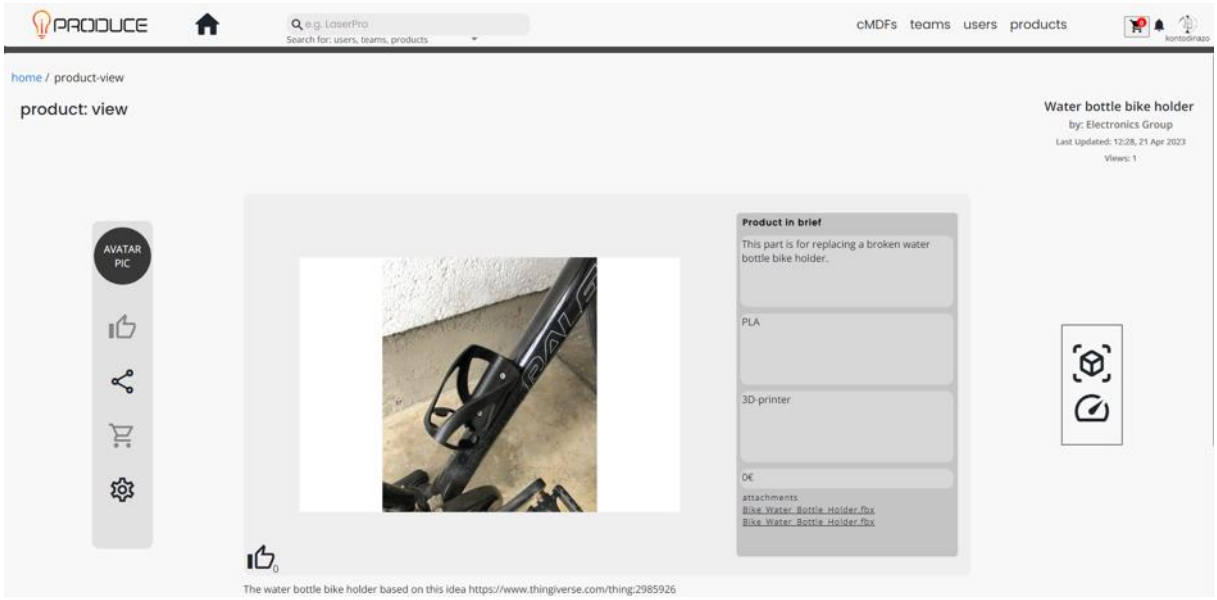


Figure 95. iPRODUCE platform, product created by the “Electronics Group” team

The second team, “Chalkidona”, composed of two members, developed a 3D printed smart luminous artefact (Figure 96), based on a design emerging from the winning idea of the 2nd Open Competition of the iPRODUCE project. For this specific project idea, 17 students of the 6th grade of the Elementary School of Koufalia of the Region of Thessaloniki in Greece created a map with the borders of the six European countries of iPRODUCE cMDFs, including: Denmark, France, Germany, Greece, Italy and Spain. The final product is a controllable table lamp for children, with customised 3D printed figure and electronics housing. This team utilised the Marketplace in order to create the users profile, and the Matchmaking tool in order to find suitable users to create a team and finally create and upload the product.

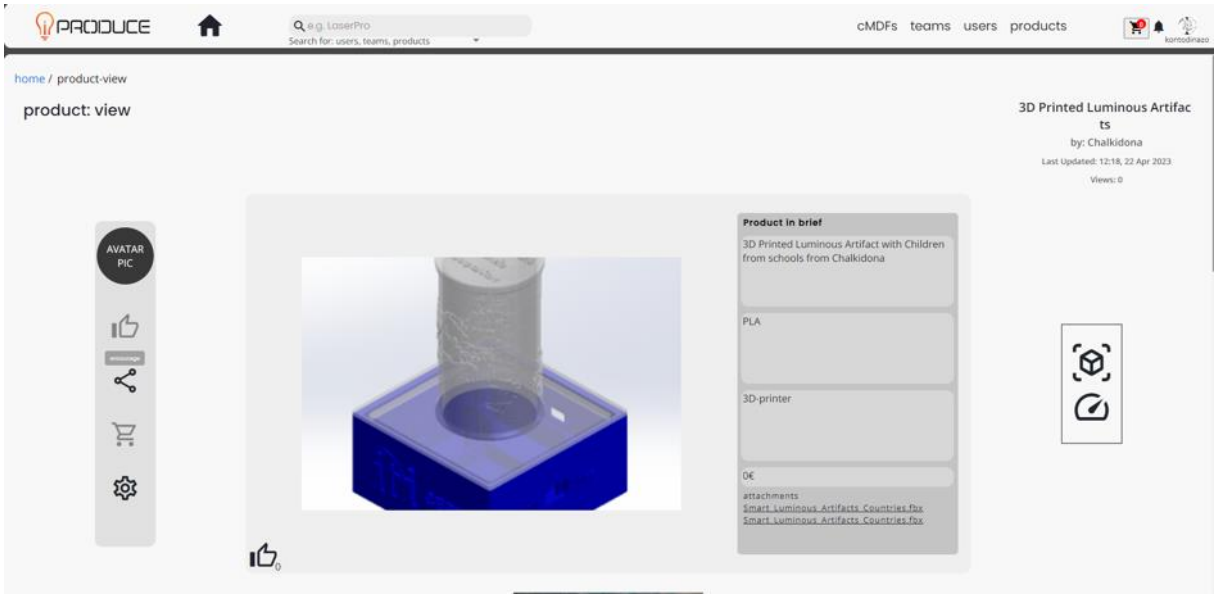


Figure 96. iPRODUCE platform, product created by the Chalkidona team

The third team, “Monstera’s Assistant”, presented an innovative moss pole designed to support plants, such as a monstera, and enhance their aesthetic appeal (Figure 97). This eco-friendly solution can be used to support plants and make them look more attractive. The moss pole also provides a natural humid environment, which promotes their growth and health, making it an ideal solution for plant lovers. The participant successfully utilised all the available tools of the OpIS platform to develop and test her idea, based on a 3D model design from Thingiverse. During the testing phase, the participant used the Marketplace, the Matchmaking, the IPR Authoring Tool, the AR/VR Toolkit, the Agile Data Analytics & Visualization Suite, and the Mobile App.

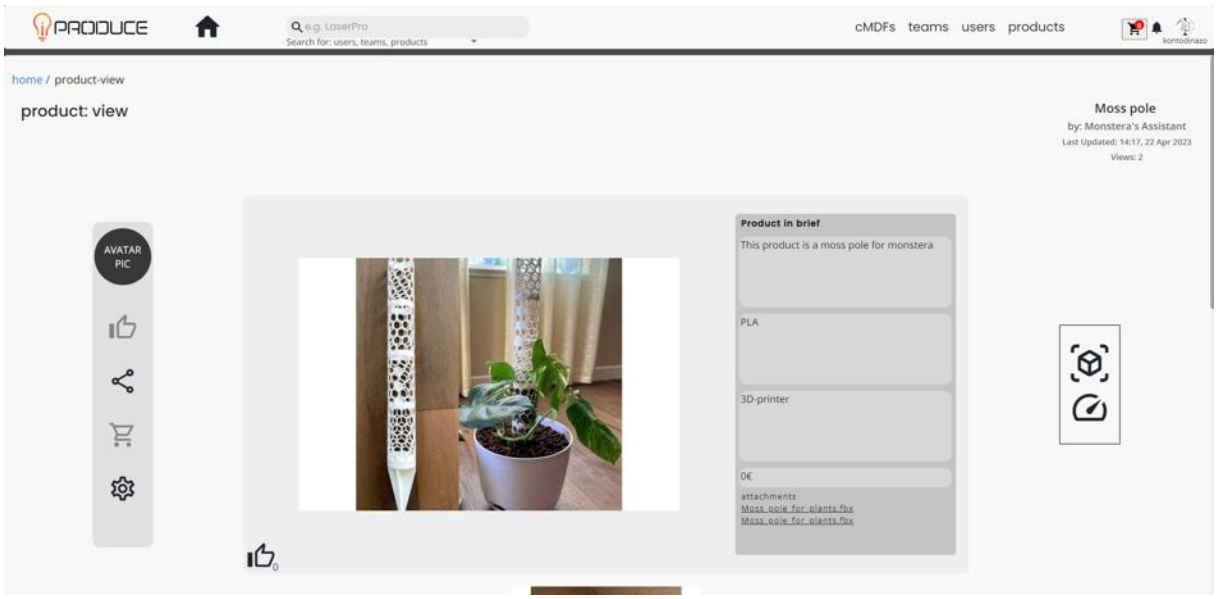


Figure 97. iPRODUCE platform, product created by the Monstera’s Assistant team

The fourth team developed the “Standing Desk Accessory”, a standing desk accessory that is designed to help users maintain a comfortable and ergonomic posture while working (Figure 98). The product, which is based on a design from Thingiverse, can be 3D printed, and includes a monitor stand, a document holder and a phone holder, all of which can be adjusted to suit individual preferences. The

participants used the OpIS platform and its available tools, including the Marketplace and the Matchmaking tool to develop and test their product.

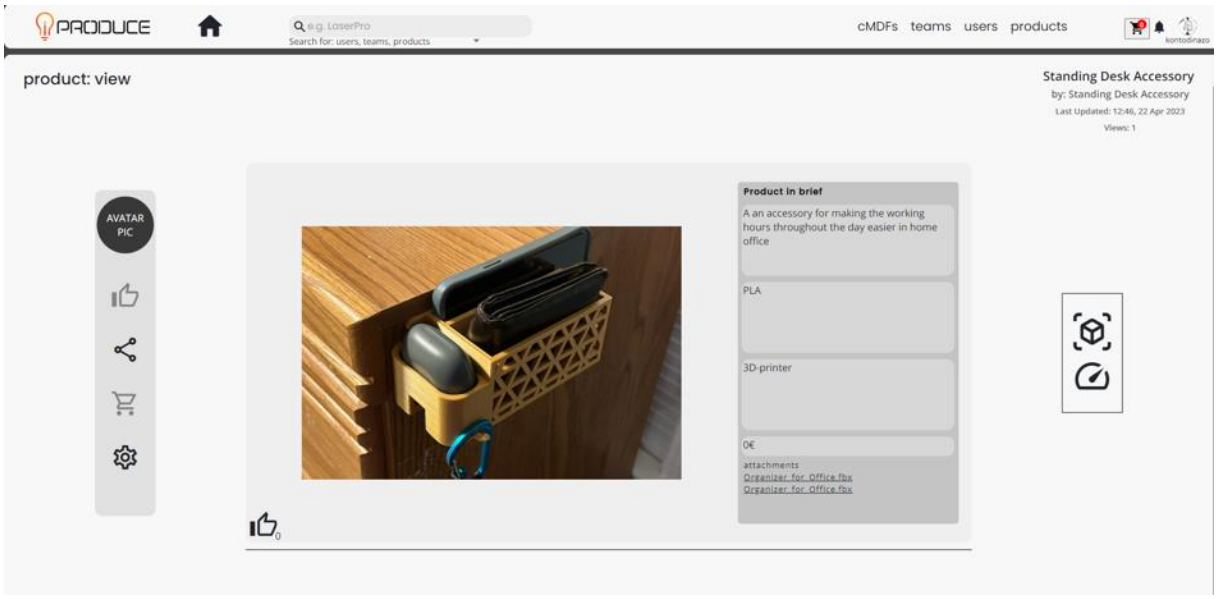


Figure 98. iPRODUCE platform, product created by the Standing Desk Accessory team

The fifth team developed “Bird Feeder”, an innovative bird feeder design that can be easily 3D printed (Figure 99). The product is designed to hang on a tree or hook and is equipped with multiple perches to accommodate different types of birds. The feeder can also be filled with different types of seed to attract a variety of bird species. The participant used a design from Thingiverse as inspiration and worked with the OpIS platform, namely the Marketplace and Matchmaking, to refine his idea.

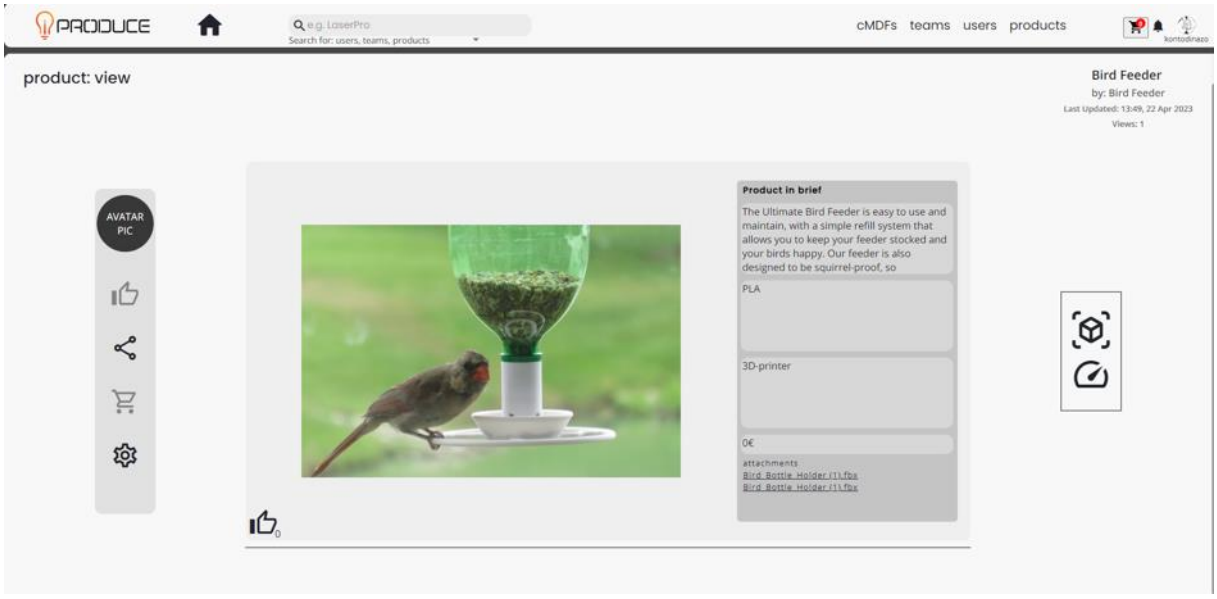


Figure 99. iPRODUCE platform, product created by the Bird Feeder team

The winning team of the Greek cMDF was the Monstera’s Assistant, developed by Afroditi Panidou, who scored the highest overall percentage for her innovative idea of a moss pole to stabilise plants. The participant was awarded with free 3D printing services and training at Aidplex and CERTH’s premises.

Figure 100. Winner of iPRODUCE Hackathon at Greek cMDF - Monstera's Assistant

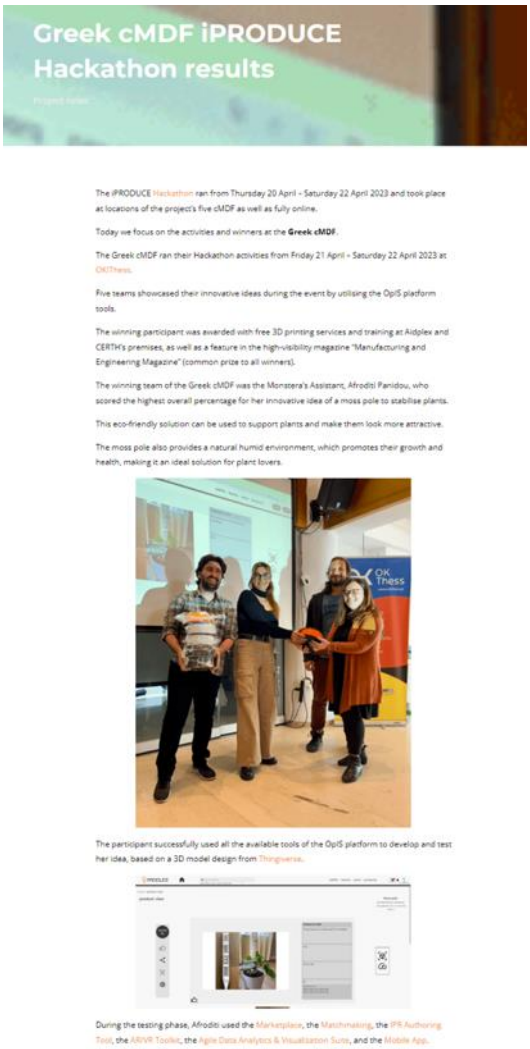


Figure 101. Greek cMDF Hackathon Winner News Piece on iPRODUCE website

Figure 102. Greek cMDF Hackathon Winner Video (prize) on iPRODUCE website

Figure 103. Greek cMDF Hackathon Winning Magazine Article

4.3.4 Italy

The Italian cMDF organised the hackathon in three different locations, FabLab UniTN (Trento - TN), Energy @ Work (Monopoli - BA) and ProM Facility (Rovereto - TN). The first one is a fablab situated in a University, whose main goal is educational, a place devoted to open, free experimentation, where students can develop their own ideas, follow their passions, and learn in a creative way – without worrying about credits and grades. The other two premises are non-profit SMEs where technologies and competences are offered to customers to foster innovation of local industrial ecosystems.

A total of 11 groups registered to participate In the Hackathon at the Italian cMDF facilities. However, only four teams completed the two days' experience and decided to pitch their ideas. Despite the limited number of groups that ended up pitching, it was still a fruitful experience from the point of view of new features being presented, general improvements discussed, and bug reporting provided.

Participants didn't join the activities with a specific product or idea in mind. Therefore, the cMDF proposed to work on some ideas, in particular a smart irrigation system for household flowerpots, that was used as a use-case in previous cMDF's events.

The four groups pitching were: Tremendous team, Reshma Penjerla, RioProM and Crop Coders.

The first two participated at the Energy @ Work location individually, but in the development of their design ideas and testing of the platform, they decided to create a group using the marketplace, sign an IPR contract and to develop the "IoT irrigation system" jointly. They were able to use all the tools at their disposal except the AR/VR tool, since they didn't have 3D design skills. In the end, they pitched separately, each one focusing on a specific topic to differentiate their presentation.

Figure 104. iPRODUCE platform, product created by the Reshma Penjerla

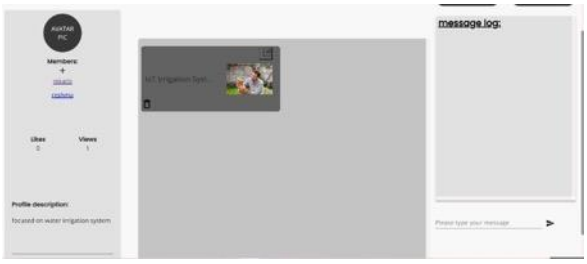


Figure 105. iPRODUCE platform, group created by Tremendous Team and Reshma Penjerla

The RioProM group participated at the ProM Facility venue, where they designed a floating barge for a water pump, intended to prevent failures with small DIY electronics equipment usually used by makers. They were able to use the Marketplace, Matchmaking and IPR tools. The team was also able to design

a 3D model in the process, but had difficulties convert it for the AR/VR tool, which was not working even with the support of the cMDF.

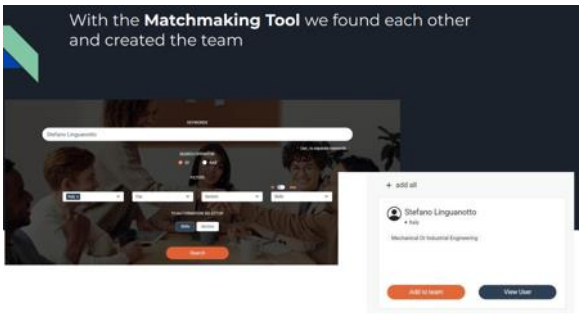


Figure 106. Presentation of RioProM group showing iPRODUCE tools used

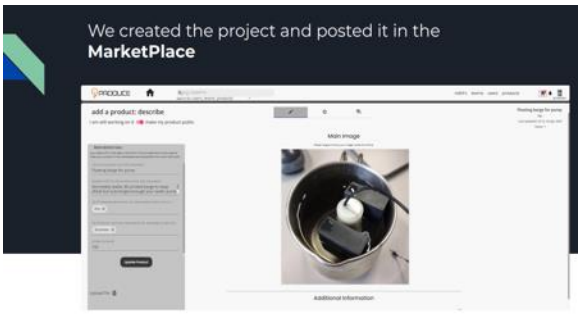


Figure 107. Presentation of RioProM group showing iPRODUCE tools used (2)

The CropCoders group participated at the Fablab UniTN and designed and realised a live demo of an IoT enabled watering system for flower pots called “CropAssistant”. On the first day of the challenge the team designed and realised a live demo using a ESP32 microcontroller, sensors and actuators, and a couple of computers to implement the IoT infrastructure. By means of Tasmota and Home Assistant SW toolkits, they were able to stream online sensors’ data and automate the process of watering the flowerpots when soil’s humidity level was lower than a threshold. On the second day of the hackathon, they focused on the utilisation of the iPRODUCE tools and reporting bugs and problems. Although they were not able to test all the tools, they were selected as winners because of the maturity of their idea with respect to the other presentations.

Figure 108. Presentation of the CropCoders team showing product and iPRODUCE platform usage

Figure 109. Presentation of the CropCoders team showing product and iPRODUCE platform usage (2)

Figure 110. Presentation of the CropCoders team showing product and iPRODUCE platform usage (3)

Figure 111. Presentation of the CropCoders team showing product and iPRODUCE platform usage (4)

Given the physical distribution of the hackathon's premises (and some logistic issues) the Italian cMDF decided to have only one jury to evaluate the products by means of a local (Italian) video call to virtually connect the three events running in parallel. Each group in turn presented their ideas and finally the winning team was awarded virtually.

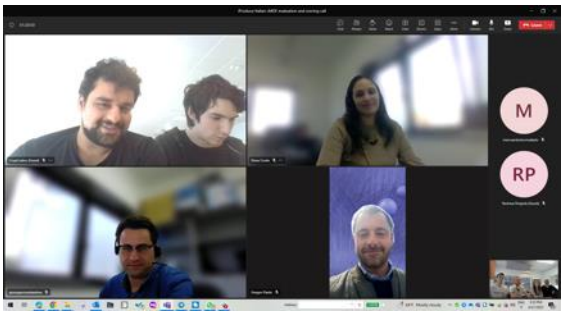


Figure 112. Italian cMDF video call shots during groups' pitching

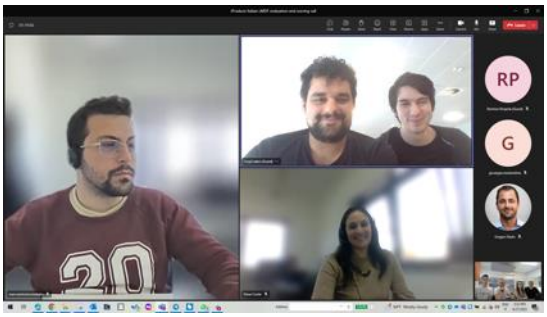


Figure 113. Italian cMDF video call shots during groups' pitching (2)

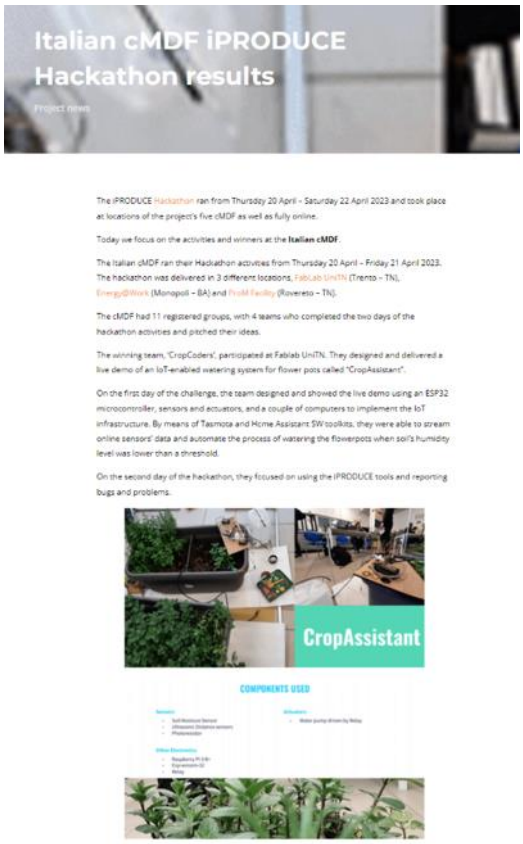


Figure 114. Italian cMDF Hackathon Winner News Piece on iPRODUCE website

Figure 115. Italian cMDF Hackathon Winner Video (prize) on iPRODUCE website

Figure 116. Italian cMDF Hackathon Winning Magazine Article

4.3.5 Spain

The Spanish cMDF hackathon activities were held at the premises of CIPFP Catarroja on 20 and 21 April 2023. Three teams showcased and produced their collaborative designs a using the OpIS tools.

The competition began with an overview of the Spanish use cases to show the possibilities and the work done by the Spanish cMDF. In general, there was a good acceptance and interest from the participants' side. They were not able to solely use the OpIS tools without the help of the Spanish cMDF team, who was available to help them with their use, projecting and showing how to use each tool. In the Marketplace, everyone was able to create a profile, then create a team using the Matchmaking tool, but in general the participants felt some confusion using them. Users did not know how to save the profile and were looking for a save button. The Oceano Naranja team presented the product´s specifications to co-create and co-design a product (a shelf) and the participants could modify it, add/delete whatever they want, and create a totally new and original product. It was made with a base 3D model to save time in the design of the rest of the structure based on the specifications explained. The Spanish cMDF explained the Design Brief to be followed by the participants:

Figure 117. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF

Figure 118. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (2)

Figure 119. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (3)

Figure 120. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (4)

Figure 121. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (5)

Figure 122. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (6)

Figure 123. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (7)

Figure 124. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (8)

Figure 125. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (9)

Figure 126. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (10)

Figure 127. iPRODUCE Hackathon Design Brief Presentation by Spanish cMDF (11)

After providing the instructions, all participants started using Fusion 360 software for the co-design phase. After 2 hours, all participants simultaneously modified the 3D file and exported it to FBX using Blender.

The product that was created was then uploaded in the Marketplace with an IPR contract generated. Some problems were raised with the IPR contract and the AR/VR toolkit. The creation of the survey was also somewhat confusing for the users but they could follow the explanations on the projection with the beamer. Some users did not understand the survey on the mobile app and therefore were not able to see the result on the Agile Data Analytics (ADA) tool. However, in general, most of the users succeeded to see the surveys and the answers in the ADA.

On the second day, activities continued with the Bug reporting activities. AIDIMME was involved in the reporting process to see if they could help solve any issues identified. Each team went to the workshop for machining their prototype in the CNC machine. Afterwards, each team made a pitch to the judging panel regarding their product (creation, inspiration, …) and how the tools were used... Finally, all teams filled the Product Profile Form, and the award ceremony was organised.

Teams

Los primos

This team consisted of 3 members. They created a project named “Watanteria” that is shelving with three levels with the idea to be easy to transport and have laterals where users can use like handles. A glass panel could also be added. The team used all the iPRODUCE tools.

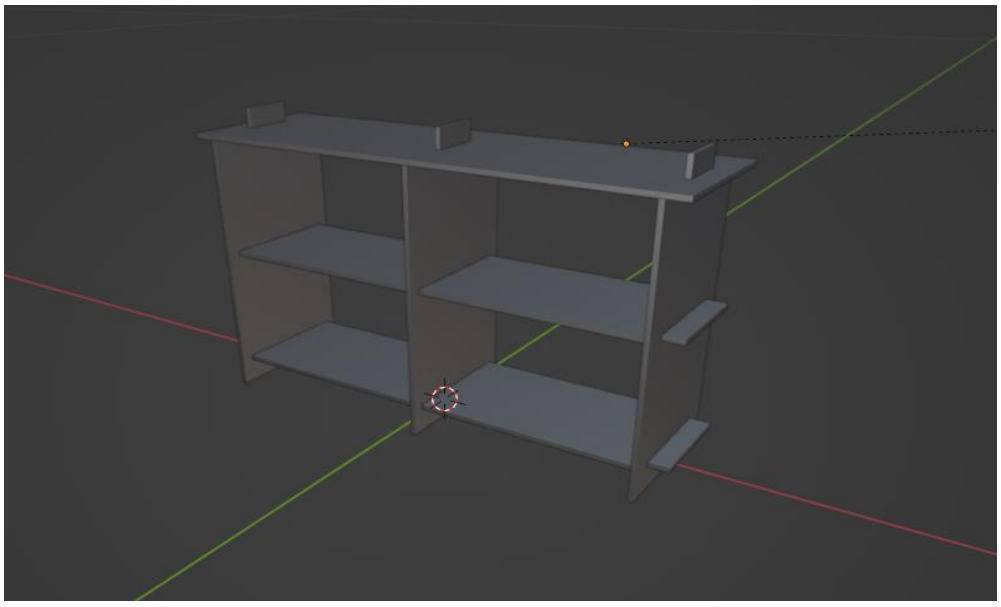


Figure 128. 3D model called "Watanteria"

Figure 129. Producing their product in the workshop

Figure 130. Presentation of the project

Black&White

The Black&White team consisted of 3 members. Their product's name is "Lechuguita" which means small lettuce and the design is inspired by this vegetable and the form of the plant leaves. The design is also inspired by the current tendency of mirrors. They created this prototype on a smaller scale so it could fit on a desk. They have included a disruptive shelf and they have not used any type of fitting (ironwork). The team created the 3D model in AutoCAD and uploaded the model to Marketplace and used all the iPRODUCE tools.

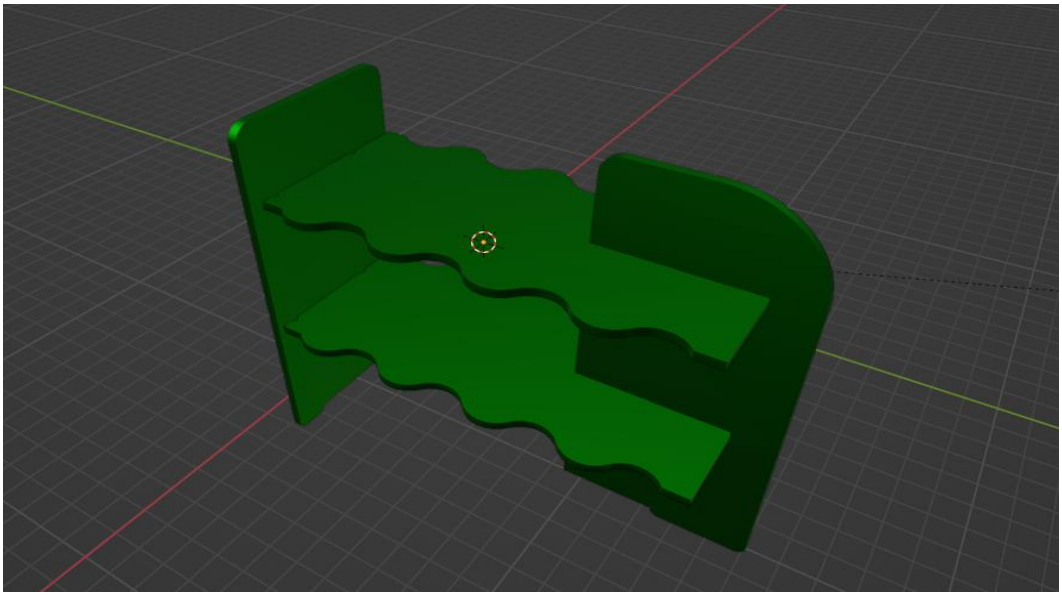


Figure 131. 3D model Lechuguita

Figure 132. Producing their product in the workshop

Figure 133. Presentation of the final product

Figure 134. Presentation of the final product (2)

The Doubts

The Doubts team developed a project with the same name and the design is based on the model presented as a basis to everyone. The team has played with the depth of the design, and they made the sides in the shape of a pyramid. They have used tenon and box assembly to avoid using fitting (ironwork). The laterals are adjustable and can make the shelving taller. The solution is considered adequate for shoe storage.

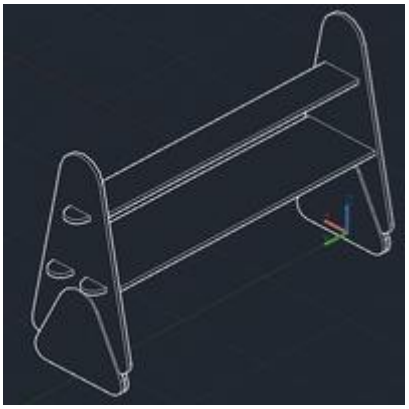


Figure 135. 3D model of The Doubts

Figure 136. 3D model of The Doubts (2)

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Figure 137. Usage of the iPRODUCE tools - AR/VR by The Doubts

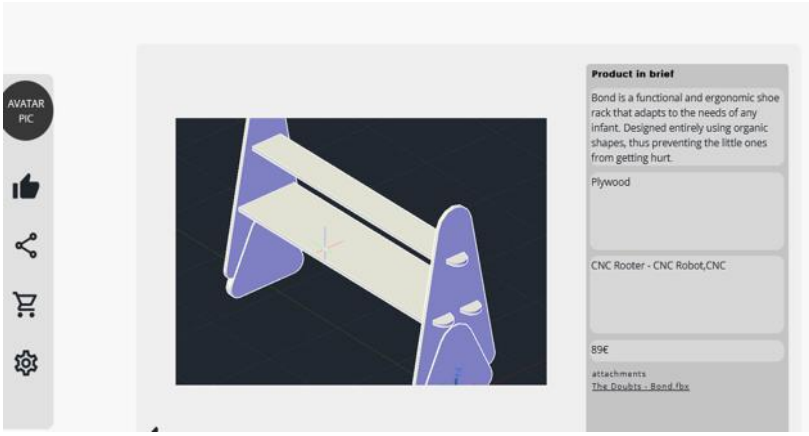


Figure 138. Usage of the iPRODUCE tools – Marketplace by The Doubts

Figure 139. The Doubts team working on their product

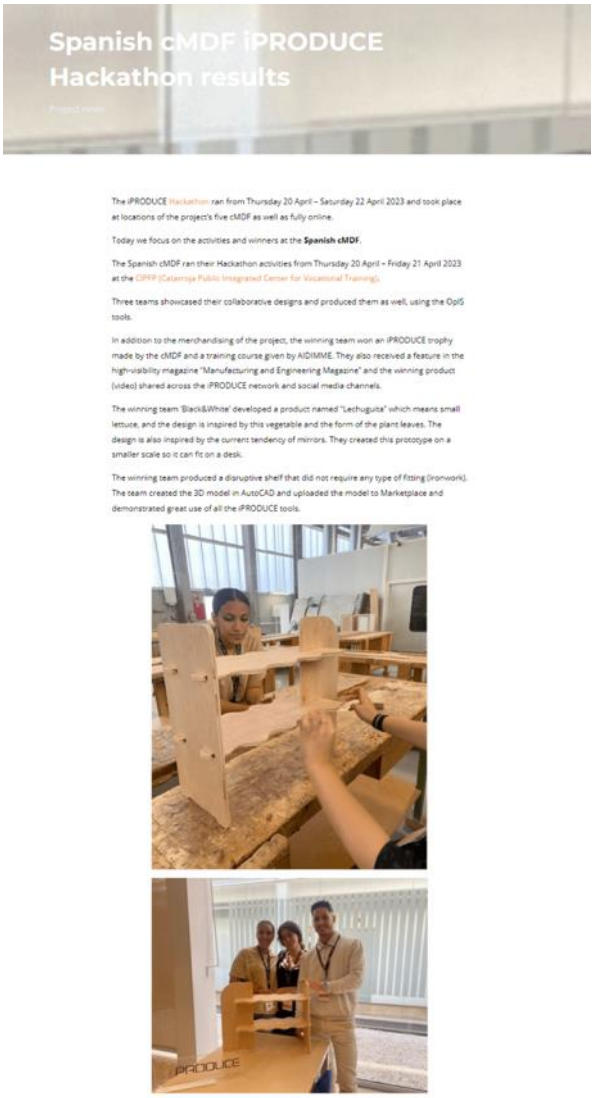
Figure 140. Presentation of The Doubts project

After having evaluated the participating teams, the result was a draw between the teams Black&White and The Doubts, with the bug reporting coming in at tied scores as well. Having resorted to the tie-breaker criteria, it was identified that team Black&White was the winner of the Hackathon at the Spanish cMDF.

Figure 141. Winner of iPRODUCE Hackathon at Spanish cMDF - Black&White

Figure 142. Award Ceremony - Winner of iPRODUCE Hackathon at Spanish cMDF - Black&White

In addition to the merchandising of the project, the winning team won an iPRODUCE trophy made by the cMDF and a training course given by AIDIMME. In the image above you can see Manuel Sánchez awarding the prizes to the team.



Spanish cMDF iPRODUCE Hackathon results

The iPRODUCE Hackathon ran from Thursday 20 April – Saturday 22 April 2023 and took place at locations of the project's five cMDF as well as fully online.

Today we focus on the activities and winners at the **Spanish cMDF**.

The Spanish cMDF ran their Hackathon activities from Thursday 20 April – Friday 21 April 2023 at the CIPFP (Catarroja Public Integrated Center for Vocational Training).

Three teams showcased their collaborative designs and produced them as well, using the OpIS tools.

In addition to the merchandising of the project, the winning team won an iPRODUCE trophy made by the cMDF and a training course given by AIDIMME. They also received a feature in the high-visibility magazine "Manufacturing and Engineering Magazine" and the winning product (video) shared across the iPRODUCE network and social media channels.

The winning team 'Black&White' developed a product named "Lechuguita" which means small lettuce, and the design is inspired by this vegetable and the form of the plant leaves. The design is also inspired by the current tendency of mirrors. They created this prototype on a smaller scale so it can fit on a desk.

The winning team produced a disruptive shelf that did not require any type of fitting (ironwork). The team created the 3D model in AutoCAD and uploaded the model to Marketplace and demonstrated great use of all the iPRODUCE tools.

Figure 143. Spanish cMDF Hackathon Winner News Piece on iPRODUCE website

Figure 144. Spanish cMDF Hackathon Winning Video

Figure 145. Spanish cMDF Hackathon Winning Magazine Article

4.3.6 Online

With two online teams in the final to pitch to the judges, it was a very close call between the two teams with good concepts and products being produced as a final result.

Team Balder & Bragi developed a mood lamp designed to create the perfect atmosphere in any room of the house. It can be connected to a smartphone to create personalised lighting moods and can react to sound to enhance the desired atmosphere. The lamp is made in an eco-friendly way while being easy to use. It was described as being ideal for parties, romantic dinners or just relaxing at home, and can help create quality time with family and friends. The product did not demonstrate great evidence of using the iPRODUCE platform and the tools and was therefore scored as the runner up in this competition.

Figure 146. Balder & Bragi Developed Product - Mood Lamp

Figure 147. Balder & Bragi Developed Product - Mood Lamp (2)

The winning team KLON3D scored the highest by presenting a 3D visualisation of their product which is a 3D scan photobooth, where individuals can take a self instant 3D scan of a person or animal. As 80 pictures are taken in an instant, it is not required to hold a position for minutes and you can also scan people with medical conditions, children and animals. This product can be used for medical and entertainment applications and can be seen from the images below.

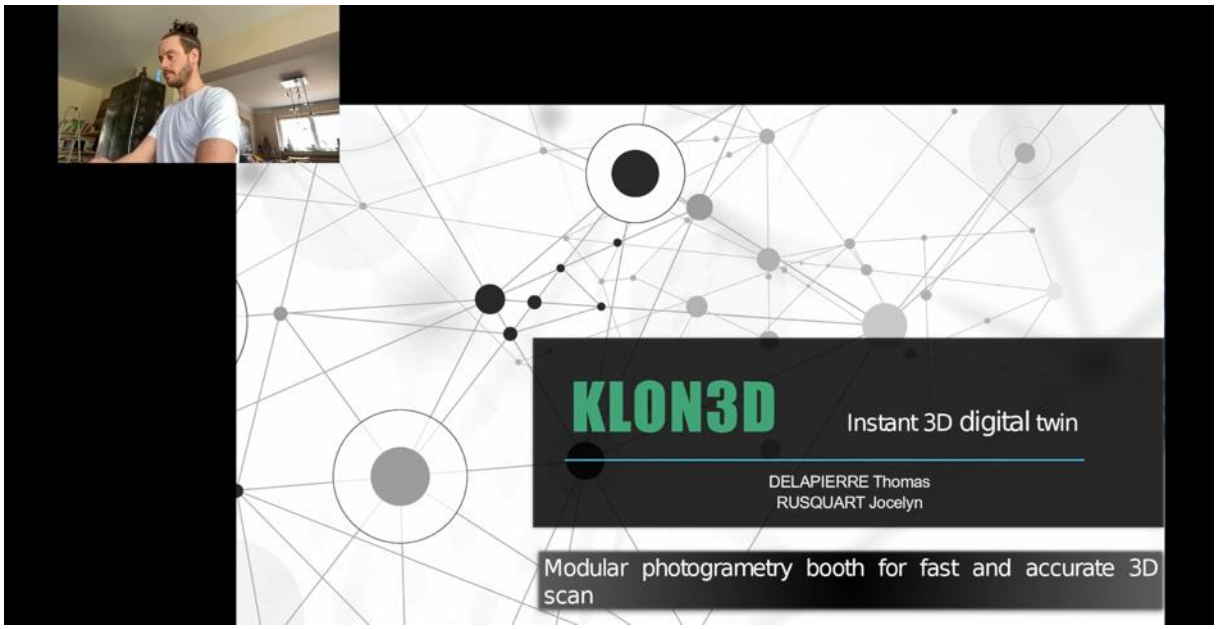


Figure 148. Winner of iPRODUCE Hackathon Online Participation - KLON3D

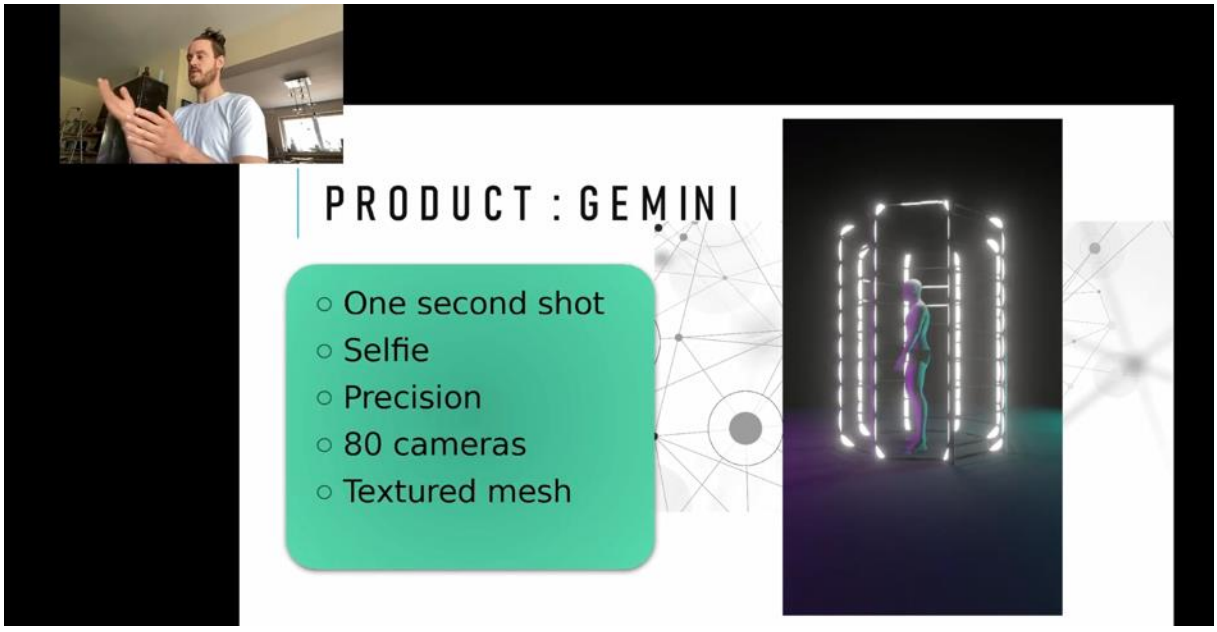


Figure 149. Winner of iPRODUCE Hackathon Online Participation - KLON3D - Developed Product

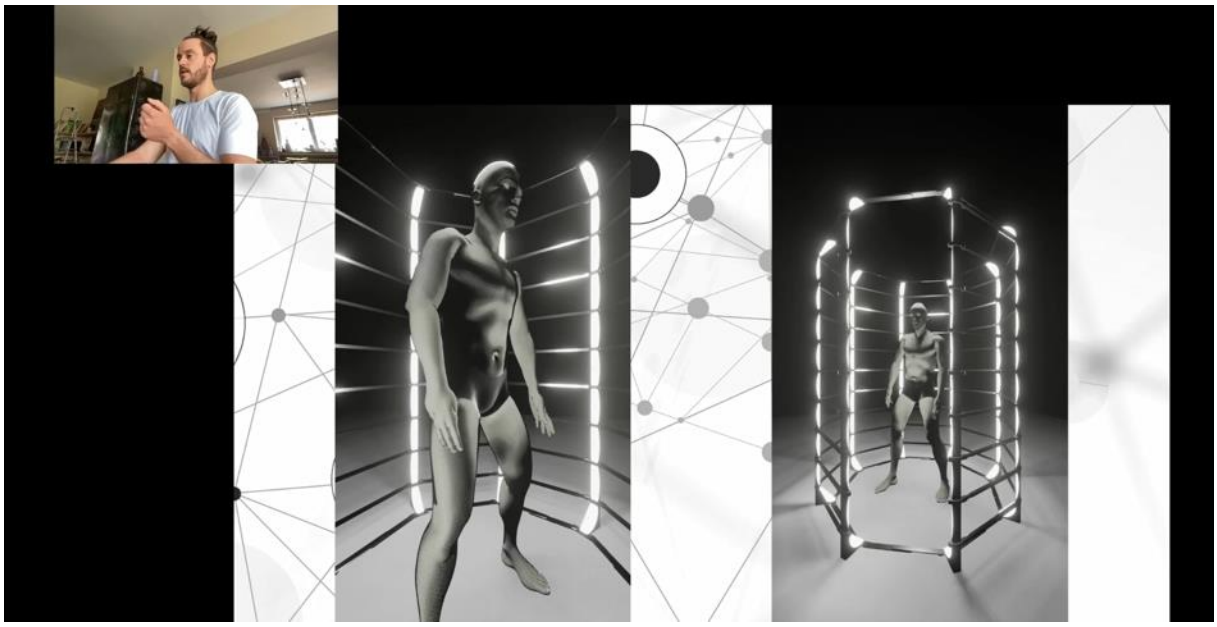


Figure 150. Winner of iPRODUCE Hackathon Online Participation - KLON3D - Developed Product (2)

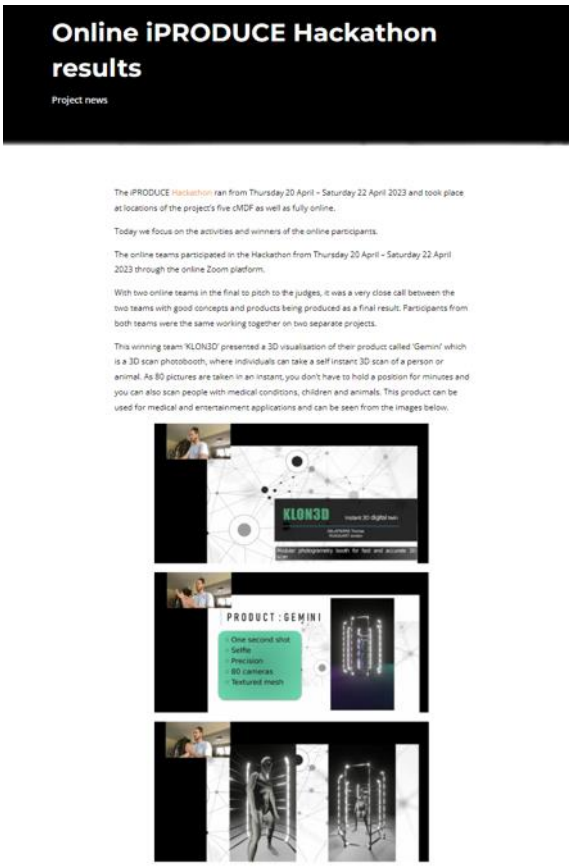


Figure 151. Online Hackathon Winner News Piece on iPRODUCE website

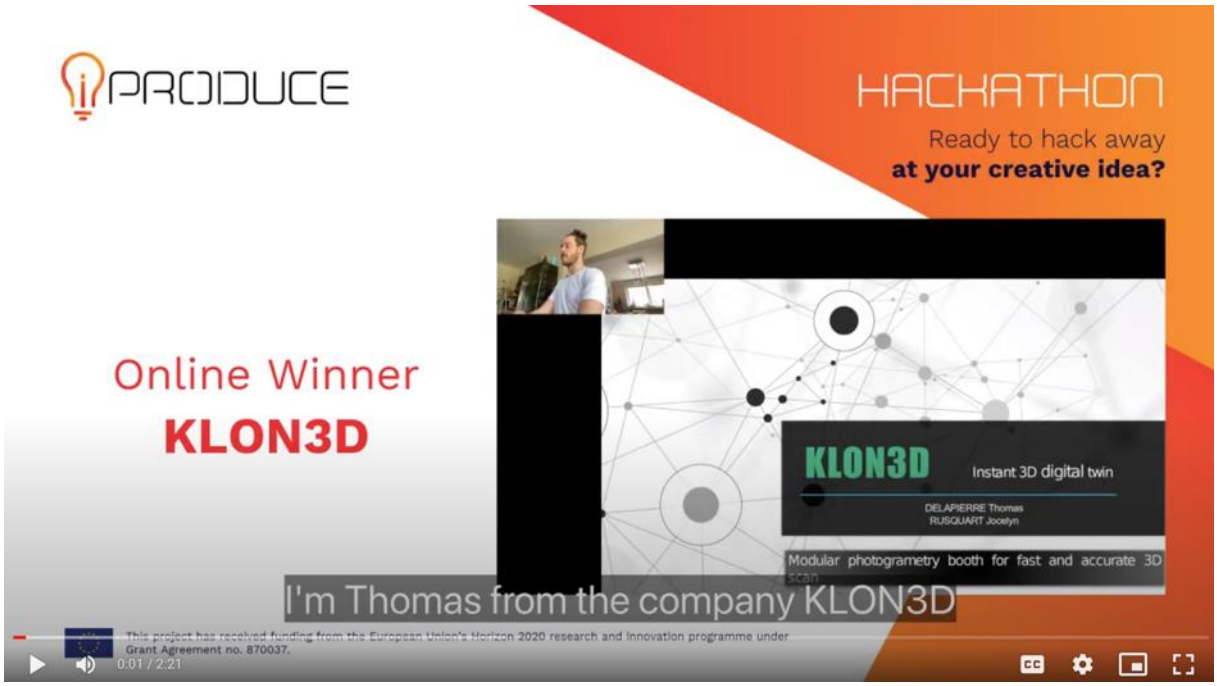


Figure 152. Online Hackathon Winner Video (prize) on iPRODUCE website

Figure 153. Online Hackathon Winning Magazine Article

4.4 Analysis and further considerations

Considering the participation in the hackathon and the activities carried out, several analyses can be made from the perspectives of each cMDF, presented in the sections that follow.

4.4.1 France

During the Hackathon, it was possible to validate many uncertainties related to the effectiveness and usefulness of the iPRODUCE OpIS Platform tools.

Most, if not all the participants, expressed their opinion about the six tools around which the Hackathon was launched and that they were supposed to test, evaluate, and use for their product development.

One thing that stood out is that the having all those tools in one place, the concept of Social Manufacturing that the platform is promoting by creating a network of makers, manufacturers, designers, Fablabs and others, and the collaboration that was highlighted by the exchange of skills, techniques and know-how thanks to the marketplace, was fully supported and appreciated.

The Marketplace, the Matchmaking tool and the Mobile App were the best evaluated OpIS tools. They are considered intuitive, clear, bug-free, and well-developed in a user-friendly perspective and point of view.

However, the Generative Design platform (not used in the hackathon but used by participants on other occasions) as well as the AR/VR tool, even with their great potential, have a less comprehensive interface in terms of functionalities; the order of steps to use the tool (which should be understood just by the buttons name) wasn't clear enough for a user/maker to navigate comfortably inside the tool.

Still regarding the Generative Design Platform, both STL and OBJ files were tested by both teams but were not able to automatically generate the basic parameters to customise their products in terms of certain dimensions (zero parameter was generated), which is the ultimate purpose of the tool.

The initial prizes of the Hackathon and incentives weren't sufficient to get a higher number of participants. Even though they played a role in getting people's attention to participate, it wasn't enough to mobilise them to come on-site to participate. It was necessary to activate the local network of Fablab members and makers and offer full support of the future development for the winner's product in order to get them to participate.

4.4.2 Germany

For the less business driven Makerspace, the OpIS tools proved a bit difficult to use. This resulted in more time spent in explaining how to use them rather than working towards developing and improving prototypes. Thus, participants expressed their difficulties in using the tools and that some were not yet sufficiently mature for the purposes of the Hackathon.

In general, the idea of the OpIS tools are good, but it was considered that it may not be at the right stages to introduce to the market.

Moreover, without the local prize incentive, it would have been difficult to find participants to participate locally.

4.4.3 Greece

During the Greek Hackathon activities, participants had the opportunity to utilise the OpIS platform tools and evaluate their ideas. Overall, the event was a great success, highlighting the entrepreneurial spirit and innovative capabilities of the Greek cMDF and of the local community of makers, manufacturers and consumers. The event demonstrated the potential of the OpIS platform tools and provided a platform for participants to exchange their ideas and collaborate with each other. The winning team, Monstera's Assistant, showed the potential of eco-friendly solutions in promoting plant growth and health, while adding aesthetic value to indoor and outdoor spaces. The event was a valuable experience for all participants and showcased the potential of the maker culture to drive innovation and create new opportunities for local communities.

Regarding the OpIS platform, the participants appreciated the variety of tools and functionalities that the platform provides. They were particularly intrigued by the Marketplace, which allows users to easily find and connect with other users and co-create customised products. Additionally, the AR/V tool received high praise from participants for its ability to create a virtual environment for users to explore and interact with their designs.

However, the participants still required proper guidance to navigate through the various tools and processes, and the involvement of the representatives of the Greek cMDF and the technical support team played a crucial role in facilitating the user journey. More particularly, the Hackathon demonstrated the effectiveness and usefulness of several of its tools, with the Marketplace, the Matchmaking, the IPR Authoring Tool and the AR/VR Toolkit proving to be particularly successful. However, there were some areas where the process of utilising the OpIS platform tools could be improved, such as streamlining the user journey and enhancing the competitiveness and the clarity in tool utilisation.

4.4.4 Italy

In general terms, the Hackathon was a nice experience that helped the Italian cMDF understand limits and direction of improvements for the platform and more in general on how to shape these kinds of events when they last more than one day.

Regarding participants, a good number were university students. However, these always have many projects and tasks to fulfil for regular courses. Therefore, for future events, one should take into consideration a period of the year when they are more relaxed to achieve a larger participation.

Regarding the time-frame of the activities, two or more days events are difficult to manage without a dedicated budget and suitable locations. The cMDF did its best relying on their resources and network of contacts but next time a longer planning and the possibility of sponsorship should be considered.

Regarding users' skills, makers focusing on electronic projects rarely have skills to realise 3D designs. Feedback was received that the Marketplace and other tools in the framework (in particular AR/VR tool) are best suited for furniture or gadgets, not really for electronics/mechatronics ideas (no raspberry or arduino for instance are present in the "materials" available in the Marketplace).

Documentation and supporting material are vital in this kind of context because most of the participants were not able to run the tools autonomously. Even the Marketplace was difficult to use without support in the case of survey creation.

To conclude, summarising the feedback received by participants, the idea behind the project and framework is very interesting and promising but there's room for large improvements before commercial utilisation.

4.4.5 Spain

The problems encountered, new functionalities, and improvements reported during the Hackathon have been very useful, so they support the development of an enhanced user experience and friendliness usage of the iPRODUCE tools. The feedback from all the participants has been positive. However, they widely reported that the tools are still difficult to use and not sufficiently agile. Aspects such as the possibility of discovering new business opportunities and being discovered based on one's own skills have been highly praised by the users. Consequently, the tools have been widely regarded as particularly valuable for fulfilling those objectives. It should be noted that it is complicated for users to exploit the tools when they are not familiar with them. For this reason, the release of user guides becomes very important to gain knowledge about the potential of the tools, to avoid the users getting lost during their use.

4.4.6 Summary

From an event organisation perspective, several lessons learned can be mentioned. First, a positive key lesson learned from the Hackathon was branding and communication. This can initially be seen in the way the hackathon was named, designed and disseminated which resulted in a positive attendance. F6S and cMDF partners contributed to the local and online marketing of the event. Change in the branding could have changed how the event was perceived and received. The lesson learned is about setting the right tone from the start which will reach the right audience and also appeal to a more creative and younger audience.

Another important lesson learned was the value of pitching. Teams at the hackathons were given 2/3 minutes for which they had to pitch their project. What this forces a team to do is to focus their ideas and their target audience. This challenge was proposed to the Hackathon participants which is not easy and for those who usually fill a 10–15-minute time slot comfortably it is a valuable challenge to focus ideas for an audience and themselves.

One of the most rewarding experiences of the Hackathon was the diversity between partners and how this impacted the Hackathon in numerous ways. The first and most obvious is the way partners work and their level of involvement and commitment to the Hackathon. Collaborative working and engagement from cMDF partners during the early planning stages of the hackathon, around processes, awareness and involvement reduced lots of stress and allowed for the event to run smoothly.

What can be taken away from the Hackathon is that by providing participants with information about the OpIS platform and the tools which were also clearly accessible, has improved the speed at which users access materials with clearly marked download links and explicitly clear information made available. There has also been a high level of engagement with the participants with valuable feedback provided from cMDF partners and the technical team.

As has been seen from the feedback provided by the participants, the OpIS tools used in the Hackathon are considered to be valuable and have interesting possibilities, but still require some further improvements (as the bug reporting process showed). Moreover, they are not equally fit for all sectors, and different people will be more or less at ease and capable of using them independently. An optimal use of the tools will require more mature solutions supported by quality documentation.

One final general remark about organising hackathons and events in the future is to make the attendees feel welcome and appreciated. This can be done in various ways, all of which should be considered including, providing on-hand support, good food, drinks, coffee, water, and working facilities. By having a clear agenda and timetable from the very start and conveying this agenda to everyone during the promotion phase, and most importantly sticking to it, has helped participants to take time away from their work/ personal lives to be a part of this event.

Within this deliverable, F6S has shown how the project has targeted a specific desired outcome, tackled this challenge and executed a successful hackathon. There should not be a one-size-fits-all approach, but clear objectives need to be in place to achieve the desired results. Overall, there should not be too much presumption of objectives, as hackathons must retain their creativity and give participants the opportunity to have fun.

5 Value of the competitions for the iPRODUCE project

These competitions boosted stakeholders to open their doors to inspiration, collaboration, and idea-sharing to efficiently shape better, smarter solutions. It also helped with kickstarting, promoting, testing and incentivising innovators to commit their efforts to new problems, which has therefore strengthened the ecosystem.

The engagement of external stakeholders in the three competitions organised (particularly Open Competition #2 and the Hackathon) was valuable as the project was able to solicit ideas and evaluate the tools externally around specific themes to a particular challenge. The different competitions varied in their structure and whom they reached, the types of ideas/ solutions they solicited and how the winning competitors were rewarded and engaged with.

The iPRODUCE competitions were designed to offer awarded participants with support in the form of technical assistance and visibility. The iPRODUCE team supported winners in maturing and refining their proposed ideas through dedicated co-design and co-development sessions. Furthermore, partners made available materials, tools, equipment and infrastructure to support the materialisation of their proposed solutions.

Technical assistance was also provided to help participants turn their ideas into tangible solutions and products with awarded winners were given the visibility of their products.

These iPRODUCE competitions have contributed to the validation of the iPRODUCE value proposition, particularly the OpIS platform and respective tools.

6 Final considerations

Through delivering these highly valuable open competitions in line with the project activities, it was possible to expose the iPRODUCE project to a wide range of stakeholders, encouraging internal and external innovation, tapping into local innovators who were able to implement ideas, solutions, and business models to address specific challenges. These stakeholders were represented from different sectors, with dynamic local actors, and within key industries.

All competitions took the form of a specific challenge and offered prizes that were well-thought-out which created meaningful impact. Dedicated time from each of the partners involved in the competitions were devoted up front in the planning stages to clarify what was hoped to achieve and how. This proved to be tremendously important with all the competitions in the design phase mitigating any challenges ahead and during the delivery phase.

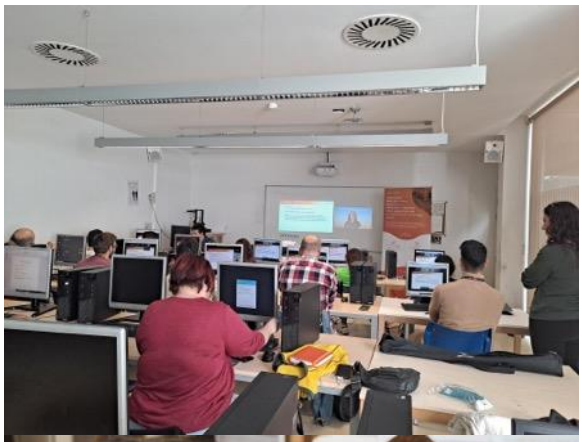
Participants were able to address various challenges from different angles and aspects which encouraged a range of approaches and solutions. cMDF partners were also able to offer flexible support to address the needs of nascent and more mature innovators. Prize winners were able to demonstrate their effectiveness through enticing people to use their solutions to scale and accelerate impact.

Overall, more than 200 individuals participated in the three iPRODUCE open competitions, people that became more aware of the iPRODUCE value proposition and the potential of social manufacturing and open innovation.

To conclude, it is considered that the competitions proved to be successful by engaging external inspiration, ideas and problem solvers for the different challenges and have unlocked a growth potential impact, which has brought in new ideas into the ecosystem.

Annex 1 – Images of the Hackathon activities

Images from the Spanish cMDF Hackathon activities





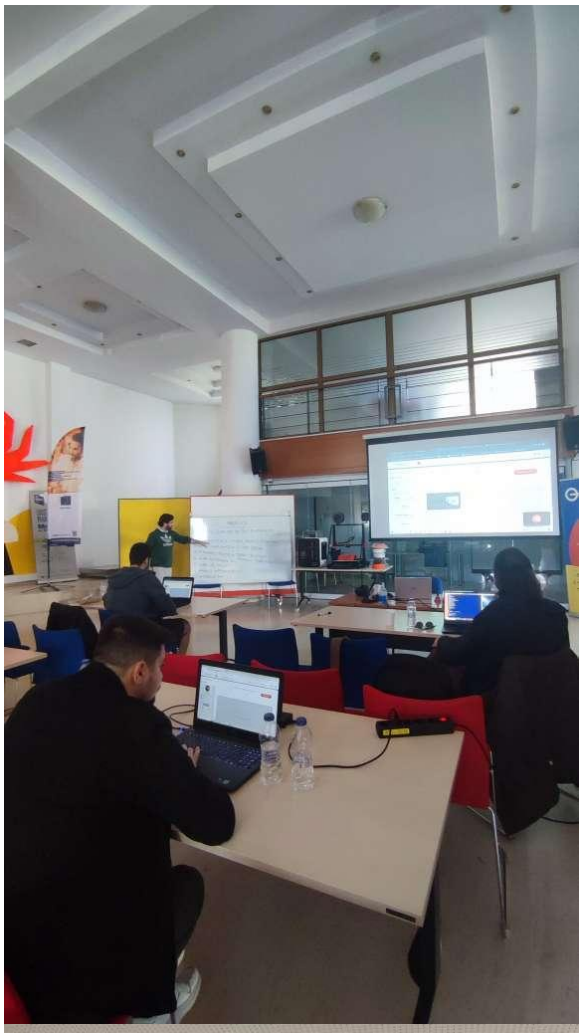
Images from the Italian cMDF Hackathon activities

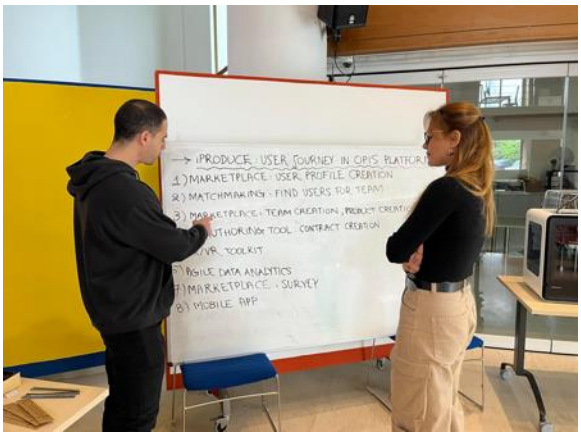




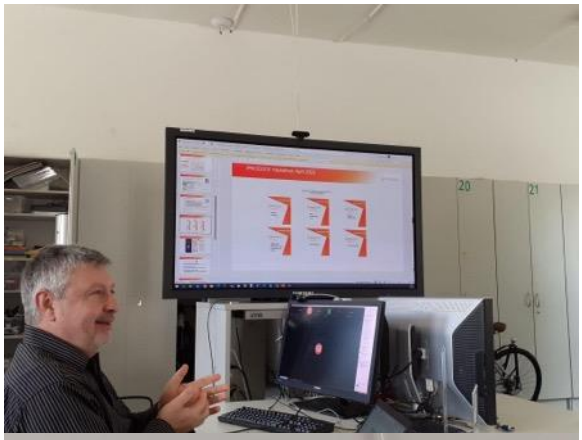

Images from the Greek cMDF Hackathon activities

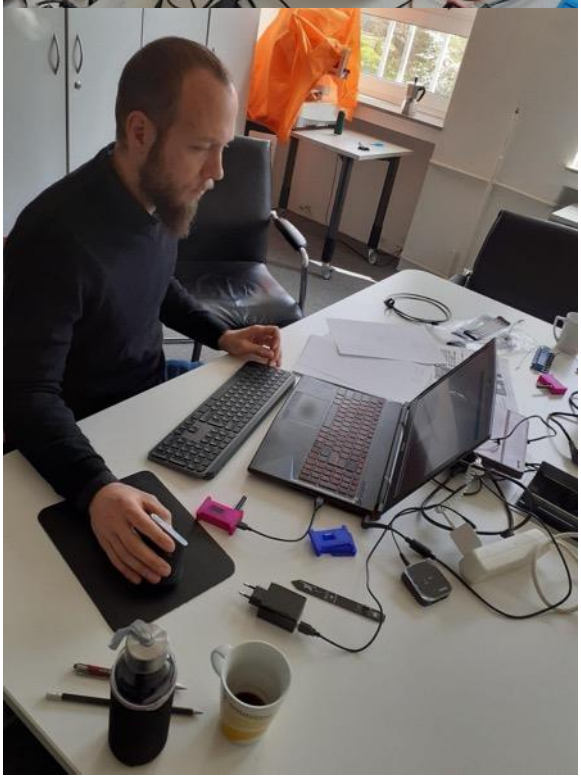

iPRODUCE
USER JOURNEY IN OPIS PLATFORM
1→MARKETPLACE→USER PROFILE CREATION
2→MATCHMAKING→FIND USERS
3→MARKETPLACE→TEAM CREATION
4→AR AUTHORING TOOL→PRODUCT CREATION
5→AR/VR TOOLKIT
6→AGILE DATA ANALYTICS
7→MOBILE APP

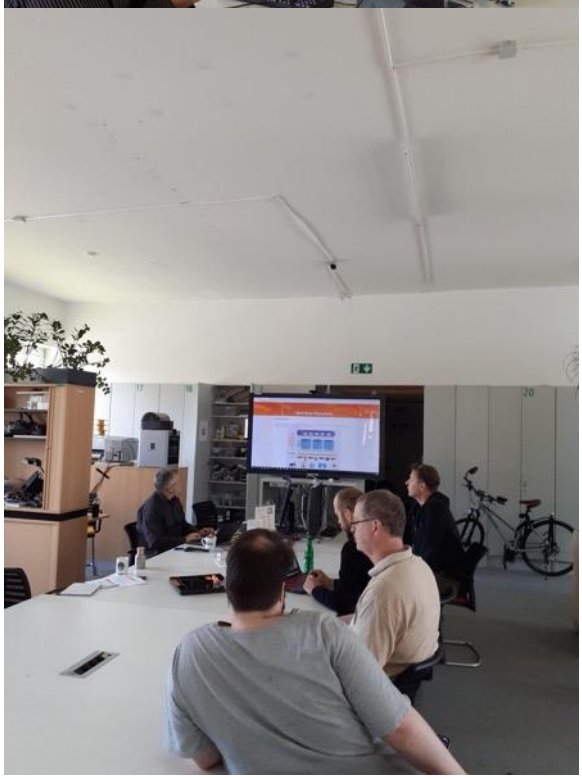




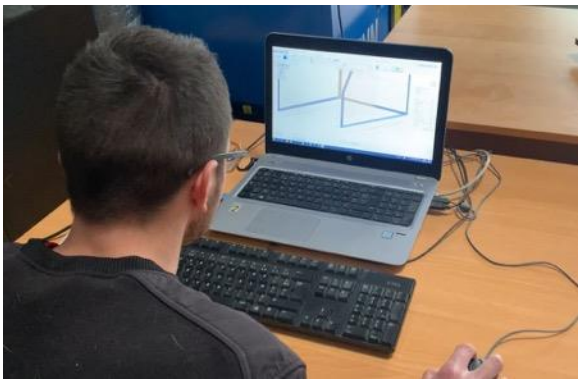
Images from the German cMDF Hackathon activities

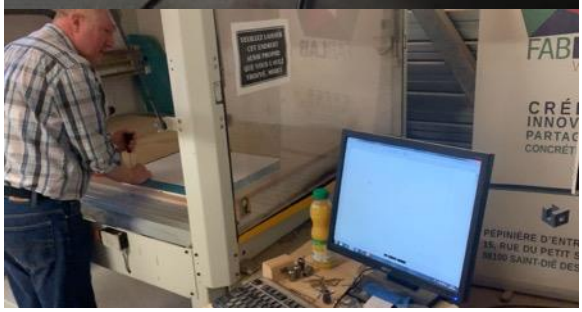






Images from the French cMDF Hackathon activities





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