D2.2 Stakeholder Requirements for UDI in the Consumer Goods Products 2

White Research (WR)

June 2021

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 870037.

DELIVERABLE INFORMATION	
Author(s)/ Organisation(s)	Artemis Psaltoglou (WR), Dimitrios Chapizanis (WR), Ioannis Kostopoulos (WR), Kostas Bougiouklis (WR)
Document type	Report
Document code	D2.2
Document name	D2.2Stakeholder Requirements for UDI in the Consumer Goods Products 2
Status	EU
Work Package / Task	WP2, T2.1
Delivery Date (DoA)	June 2021
Actual Delivery Date	29 June 2021
Abstract	This report complements D2.1 and presents the main findings of the iPRODUCE Task2.1 2nd round, EU-level, survey that captured EU citizens', makers' and manufacturers' perceptions, needs around social manufacturing, insights about makerspaces' acceptance as well as main drivers and barriers of their development. The report is structured as follows: *Section 1* provides a short description of the context that motivated the project and introduces the main research questions that guided this study. *Section 2* presents an up-to-date literature review regarding the main drivers, barriers, and challenges of makerspaces and current state-of-the-art in the field of social manufacturing. *Section 3* includes all information related to the survey design and implementation methodology. In *Section 4*, we present descriptive findings closely related to individual perceptions and levels of acceptance. This section also includes the main findings from the statistical analysis of the 2nd round dataset using an Ordinary Least Squares (OLS) model. *Section 5* provides theoretical recommendations, based on the identified behavioural and intentional insights that were captured in T2.1, highlighting potentially desirable features with regard to the design of the iPRODUCE platform for social manufacturing. Finally, summary of key findings, conclusions and further discussion are presented in *Section 6.*

DELIVERABLE HISTORY			
Date	**Version**	**Author/ Contributor/ Reviewer**	**Summary of main changes**
16/06/2021	V0.1	WR	Version circulated for internal reviewing
29/06/2021	V1.0	WR	Version sent to coordinator

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

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

Executive Summary

Exploring the current state-of-the-art of the collaborative production and makerspaces across Europe is essential for providing and developing an effective framework towards empowering the uptake of collaborative manufacturing ecosystems in the consumer goods sector. Lack of awareness and low social acceptance levels can greatly affect the course of these projects and can emerge as significant barriers for user-driven innovation (UDI). Especially in the case of collaborative production projects that require a complex multi-actor involvement, social acceptance can pose a serious threat to the successful implementation and sustainability of the project.

The aim of this updated report is to **gain EU-wide insights into the main drivers boosting social acceptance of makerspaces and collaborative production projects, and to identify possible barriers and gaps limiting wider adoption of these initiatives**. After a 1st round pilot-level survey, findings of which were thoroughly reported in D2.1, this document (D2.2) presents the outcomes of the 2nd round, EU-level, survey. The wider-scale survey analysis comes to **complement and enhance the previously identified needs**, focusing now mostly on potential differences arising among the project's main stakeholder groups across Europe.

Building on the data collected, descriptive statistics and advanced inferential analytics were applied to explore relations, patterns, and potential groupings, producing meaningful intelligence that can feed the subsequent tasks of the project. **The key findings of the survey analysis, including the understanding and classification of stakeholders' perceptions and needs, reveal the main drivers and barriers as well as their support needs upon which iPRODUCE can better target and fine-tune the project's foreseen actions** (i.e., establishment of cMDFs[1], collaborative tools, user innovation tools, incentives, etc.). The report is structured as follows:

Section 1 provides a short description of the context that motivated the project and introduces the main research questions that guided this study.

Section 2 presents an up-to-date literature review regarding the main drivers, barriers, and challenges of makerspaces, in order to present the current state-of-the-art in the field of social manufacturing.

Section 3 includes all information related to the 2nd round (EU-level) survey design and implementation.

Section 4 is the most extensive section of the report and is structured to reflect the **outcomes** of survey analysis. We first present descriptive findings closely related to individual perceptions and levels of acceptance around social manufacturing. This section further includes the main statistical analysis of the 2nd round dataset by including the outcomes of the Ordinary Least Squares (OLS) models that were built to further explore drivers, barriers and digital features related to the makerspaces, Fablabs and online platforms.

Section 5 provides insights on potentially desirable features of the iPRODUCE platform for social manufacturing.

Section 6 updates the 1st round (pilot-level) survey preliminary insights, presenting a summary of the EU-level analysis' key findings, conclusions, and further discussion.

[1] Collaborative Manufacturing Demonstration Facilities (cMDFs): Local cMDF are at the heart of iPRODUCE and are expected to become the main stimulating drivers to launch, promote and realise the envisaged collaborative engineering and co-creation activities, while they will capitalise on novel consumer engagement approaches.

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1. Introduction

Over the last decade, an underlying cultural trend has been gaining attention and traction: collaborative production, social manufacturing, and the maker movement. The prosumer trend, the rapid expansion of makerspaces, the increased availability and affordability of digital fabrication tools such as 3D printers and laser cutters and the advance in digital collaborative technologies have led to the creation of a rapidly increasing number of Do-It-Yourself (DIY)[2] communities. Across the world, the maker movement is introduced as a driver for the new "industrial revolution". Collaborative production, however, like most newly emerging fields, still has many challenges to overcome before reaching its full potential.

The European Commission (EC) acknowledges that common collaborative production challenges include (i) the scaling up of manufacturing to a sufficiently large scale, (ii) the lack of viable business models and (iii) the tension between democratised manufacturing and existing market regulations (EC, 2015). The latter is also connected to issues of safety and quality of community manufactured goods. On top of these macro-level barriers, a series of subtler interconnected issues exist. Maker communities struggle between the sharing approach and the entrepreneurial one, often causing resistance to scaling efforts. Most importantly, in some cases, opinions around makerspaces can significantly limit local support and participation.

The makers' community is calling for increased networking and network experience, sharing and adoption of best practices and a more holistic, culturally expansive, and community-centric role for makerspaces (ASEE, 2016). The EC invites policy makers to support collaborative production by encouraging shared physical and digital manufacturing infrastructure and networks. EC further calls for regulation that encourages and mainstreams democratised manufacturing (EC, 2015).

Scholars argue that in order to be able to tackle current barriers and inform effective policy and application around collaborative production, planners need to **first understand the stakeholders involved in the making communities; the general public, the makers as well as manufactures/industrial actors** (Komninos et al., 2019; Wolf-Powers et al, 2017; Angelidou and Psaltoglou, 2017). What is currently missing is a deeper understanding of the attitudes and needs as well as of the most predominant norms, stereotypes, and views with regard to social manufacturing. **There is a dire need to shed light not only on the demographics of makers and people who can potentially be makers but also examine their beliefs, incentives and goals so that better engagement strategies can be designed and established. This is the very scope of the iPRODUCE T2.1.**

The task's actions aim at enabling a better understanding of the consumers, makers and industrial stakeholders in (i) the project's 6 pilot countries (1st round survey – D2.1) and (ii) across the EU (2nd round survey – D2.2), along with their preferences, level of understanding and behavioural aspects with respect to the collaborative manufacturing and the maker movement. The employed, two-phases, survey approach aims at identifying whether factors that have been associated with or assumed as important in driving relevant beliefs are indeed important in shaping key aspects of the stakeholders' intentions to act.

This updated report (D2.2) complements D2.1 and captures the 2nd round market research activities of T2.1. Through a detailed analysis of the EU – level survey, D2.2 aims to **shed light on the iPRODUCE stakeholders' perceptions and potentially pinpoint meaningful heterogeneities among them.**

[2] Do-It-Yourself (DIY) is the method of building, modifying, or repairing things without the direct aid of experts or professionals.

2. Theoretical Background

The following section provides a state-of-art in the field of social manufacturing, presenting the up-to-date findings stemming from an extended review of published research articles on the main drivers, barriers, and challenges around makerspaces. This chapter, initially introduced in D2.1, reflects the latest updates found in literature.

It is common knowledge that the world is changing; population experiences a continuous increase, alongside lifestyles and trends that are constantly shifting. Within this context, technological advances and novel tools are transforming manufacturing production processes into more open, smarter, personalised production models where user innovation plays a significantly major role. In particular, modern technology allows makers to design and engineer their creations enabling mass-customisation on a large scale, while lowering the learning curve through community, such as social networks, video publishing sites, and online forums (Kwon and Lee, 2017).

Over the last decade, the maker economy has been attracting attention while an immense growth of communities engaged in DIY activities has been observed (Rosa et al., 2018, 2017). On this basis, much research has been done on the topic of maker movement and social manufacturing, highlighting cultures and approaches. However, **there is still a lack of studies on the motivational factors behind the community participation and the "making behaviour" of makers. Aiming to shed light on this under-researched area, iPRODUCE is set out to study how the social manufacturing phenomenon is unfolding in the current manufacturing scene.**

2.1. Social Manufacturing, Maker Movement, Makerspaces, Makers

2.1.1. What Is Social Manufacturing and Maker Movement?

The term "*social manufacturing"* is characterised with high level of utilising the power of communities in order to design and produce physical goods. It captures the phenomenon of shared participation between firms and/or individuals in the manufacturing process. However, there is no established definition of how exactly this sharing can take place (Hamalainen and Karjalainen, 2017). According to Jiang (2019), social manufacturing "*covers product life cycle activities that deal with organisational and interactive mechanisms under the context of socio-technical systems in the fields of industrial and production engineering*". It is an emerging technical and business paradigm of collaborative production, associated with the maker and DIY movement, that allows prosumers to build and co-create personalised products and individualised services with their partners through integrating inter-organisational manufacturing service processes (Jiang, Leng and Ding, 2016).

Similarly, the term "*maker movement"* is still a subject of discussion. Several scholars (Rosa et al., 2018, 2017; Bean et al., 2015; Wittemyer et al., 2014) have attempted to provide a definition of this trend, as an evolving branch of the DIY movement. It is often described as an innovative form of manufacturing production that combines cutting-edge technologies, such as 3D printing and laser cutting, with arts and crafts activities. It is a cultural trend that promotes learning, innovation as well as design thinking and places value on an individual's ability to be a creator as well as a consumer. In this context, "making" is characterised as the process of activities - such as designing, building, modifying, and/or repurposing material objects - oriented towards making a ''product'' that can be used, interacted with, or demonstrated (Martin, 2015).

2.1.2. Where is making taking place?

The physical representation of the maker movement would be the *makerspaces*. Makerspaces are community-based initiatives, hosted in open spaces, that empower people to access technologies and cultivate skills for design and fabrication. Individuals are enabled to make things for themselves or with others in self-directed projects. Makerspaces are introducing design, prototyping and innovation to wider, non-professional participation (Davies, 2017). Participants in these spaces learn by doing and exchange knowledge and skills with one another.

A makerspace is usually equipped with small-scale versions of highly versatile, digitally-enabled design and fabrication tools, originally developed for rapid prototyping in industry, as well as providing more traditional hand tools associated with various crafts (Smith, 2017). Some makerspaces are self-defined as "hackerspaces", linked to a tradition of workshops that goes back to hacker communities in the 1990s (Maxigas, 2012). A more formalised network of initiatives adopts the label "Fablabs" - Fabrication laboratories (Gershenfeld, 2005). Other initiatives and workshops define themselves as makerspaces and remain member-based, though non-profit, and - like hackerspaces and many Fablabs - have "open day" events and a community-orientation. While differences are observed between existing makerspaces, there are also strong similarities. As Smith states (2017), all these makerspaces "*at heart share a common commitment to tools for people*" In this report "*makerspace*" is used as an umbrella term, covering all these common-nature initiatives and workshops.

The aim of these initiatives is to provide makers and their communities the infrastructures and technical equipment required to turn their ideas into actions and, eventually, products. Makerspaces serve as places of social engagement that strengthen the values of community and cooperation. They provide the opportunity for citizens to share views, express their creativity, freely experiment, and develop new skills in a collaborative structure. These spaces function as multidisciplinary learning environments that stimulate new ideas and concepts for products, accelerating invention and design cycles (Rosa et al., 2017).

While the diffusion of such spaces is impressive[3], it is far from being geographically homogeneous (Bean et al., 2015). Data collected from previous EU studies (Rosa et al., 2018) indicate that a higher number of makerspaces can be found in western European countries and among them, France, Germany and Italy are accounting for more than half of the makerspaces in EU. This could imply that there is a connection between the level of a community's economic development and the uptake of the maker movement. Nevertheless, nowadays makerspaces are present in all major EU cities, illustrating a significant spatial allocation of the maker movement across the EU; all major capital cities have at least one makerspace. It appears that makerspaces indeed flourish in large urban environments since the latter offer significant benefits, such as access to customers, early adopters, more socially conscious and environmentally aware citizens, etc (Schrock et al., 2016).

2.1.2.1. Digitisation of Makerspaces

The provisioning of digital technologies further supports social manufacturing, enhancing the opportunities and experience of co-creation and product life-cycle management. Leveraging digital features, embedded in the makerspaces' tools, opens the possibility for wider collaboration and communication between groups at a distance, by sharing and coordinating globally across tailor-made digital platforms or even social media platforms. For example, social media sites set the ground for discussing manufacturing practices whereas guiding steps and detailed design instructions are shared online over platforms like *Instructables*. Sharing the same tools and networking digitally means that, in principle, a prototype designed in one makerspace can be made, adapted and improved in any other makerspace anywhere (Smith, 2017). In this context, online dedicated fora and uploaded videos constitute an important source of advice, instruction, and discussion in gaining design and making capabilities through a non-formal learning experience (Wood, Rust, & Horne, 2009). Individuals may attend their local makerspace and learn with participants at other makerspaces globally, through online courses and shared projects.

[3] The *fabfoundation.org* website lists more than 1750 Fablabs in more than 100 countries.

Makerspaces' digital tools, therefore, further boost collaborative production. Participants in makersapces collaborate freely in the conceptualisation, design and production of an inspiring variety of objects, "*from environmental monitoring equipment, to furniture; from human prosthetics to sports equipment; from bicycles to eco-houses; from wind turbines to beehives; and all sort of things in between"* (Kohtala, 2016; Smith, 2017). While a large share of participants is involved in the process for the personal fulfilment of making things, there is an increasing number of members that use makerspaces to pursue entrepreneurial activities, educational projects, and socially oriented innovation. By collaborating in such activities and documenting them openly - building upon the latest ICT (Information and Communications Technology) advances, such as cloud computing and big data technologies - a platform infrastructure for knowledge and skills is emerging which, in turn, enables the establishment of collaborative manufacturing networks (Firmansyah and Amer, 2013; Varela *et al.*, 2018).

2.1.3. Who are the makers?

Apart from the physical spaces, an essential element of the maker movement is, of course, the people who take part in it; the makers. Literature defines makers as individuals who create a range of products, from crafts and home improvements to self-service facilities, leveraging information technology (Collier & Wayment, 2018; Kwon and Lee, 2017). Notwithstanding the variety of existing terminology, makers are people who share a common passion around handcrafts, craftsmanship. grassroot innovations, and DIY projects.

The current knowledge about makers derives mostly from qualitative studies, according to which, makers range from hobbyists to traditional artisans to more advanced software developers, and could include craftsmen, designers, artists, musicians, cooks, students, welders, scientists, engineers and software developers (Kwon and Lee, 2017; Wittemyer, 2014). In this sense, "*we are all makers*" as Dougherty, the founder of MAKE Community[4] states, implying that everyone can, or at least has the potential to, engage in making activities (Masters, 2018).

2.1.3.1. Demographics of the makers

Over the last decade, scholars have observed a variety of demographic characteristics related to makers (Wittemyer, 2014; Make and Intel, 2012). Studies reveal that makerspaces appear to be a male-dominated landscape, with women representing only a 20% share of the total makerspaces participating population. Female makers are usually engaged in making via arts and crafts such as sewing while males are more attracted to physical sciences and engineering-related projects. The median age of female participants is 28 years old, while the median age of adult male makers is 34. With regard to employment, researchers highlight that over eight in ten (83%) makers are employed and nearly one-third of them have job titles or job descriptions in technical areas (Hartmann and Mietzner, 2017).

Research further confirms that makers constitute a well-educated group, with 97% of the Makerspaces' participants having attended or graduated from college. A share of 80% has undertaken post-graduate education and more than 40% of the makers' population holds post-graduate degrees. Some of the most common degrees amongst makers include engineering, as well as computer and information science. Interestingly, it appears that male "makers" are mainly engaged in science and engineering, while women "makers" are mainly engaged in arts. Furthermore, participants of makerspaces report a high median household income and most of them are married.

The information presented above offers valuable insights around the maker's profile and calls for further inquiry. Making seems to be heavily dominated by men and especially those that are educated and wealthy. Among else, the low representation of women in the maker movement, the makers' young age, and their educational profile raise a series of questions that need to be further investigated:

[4] *https://make.co/*

- What are the specific participation challenges for women?
- Does the elderly find it difficult to take part in making activities? Why?
- Are people who do not have tertiary education involved in the maker movement? If not, why?
- Why do unemployed and economically disadvantaged people have lower participation rates?
- What type of training would empower vulnerable groups, such as uneducated, unemployed and people of low economic status, to be involved?
- How important is engineering, IT and technical knowledge and skills for participating in the maker movement?

Current studies analyse and compare various aspects that characterise participants of the maker movement. Nevertheless, only a few of them investigate whether specific social groups are underrepresented within makers' communities (Seo, 2019). Despite the movement's claims of universality, there is consistent reproduction of exclusion cases (Whelan, 2018). As reported in literature, most of the members of makerspaces are "*technically interested and well educated and, therefore, represent a particular fraction of society*" (Waldman-Brown et al., 2016). This indicates that, **while inclusiveness of making comes across as one of the key characteristics of the maker movement, whether the movement is inclusive for everyone, still remains in question**.

2.2. Drivers, Barriers, Attitudes and Challenges around Social Manufacturing

Apart from shedding light into the demographics of makers, there is a dire need to acquire a deeper understanding of the beliefs, perceptions, incentives and barriers of makers and people who could potentially be makers.

2.2.1. Drivers influencing engagement in making

Even though the maker movement is constantly growing, studies on the motivational factors that affect community participation in the making activities are still lacking (Kwon and Lee, 2017). Nevertheless, current research offers some indications for aspects that can support the uptake of this social phenomenon. For instance, makers' prior DIY experience in terms of skills, as well as materials knowledge, positively influences their decision to participate in such projects. Moreover, the benefits derived from STEM (Science, Technology, Engineering, and Mathematics) education in terms of abilities and skills are one of the main factors that make makerspaces appealing, especially to children and youth (Hartmann and Mietzner, 2017). Literature indicates that the maker movement and STEM education are closely related, and makers are interested in how the STEM fields can help them expand their knowledge through making (Sang and Simpson, 2019). Also, together with an expressed interest in learning, the will to experiment is among the top motivations (Menichinelli et al., 2017).

Scholars also point out that motivations also include economic benefits and economic savings (Collier and Wayment, 2017; Wolf and McQuitty, 2011). The lack of available or affordable high-quality products, together with the need for more customised – tailored to personal needs - items, also motivates people. In addition, the growing anti-consumption ideology and sustainable lifestyle patterns seem to be among the key drivers for the engagement in makers communities. Along these lines, the use of recycled and reclaimed materials in the produced work and crafts significantly motivates people (Collier and Wayment, 2017). The existence of available urban spaces is also an important factor since it helps makers to build the knowledge and, especially, the relationships that will further enable them to be involved in making activities (Wolf-Powers, 2016). However, even though having a common co-working area where makers can share tools is important, what also motivates participation is the community spirit and the co-existence of a variety of different mindsets. As such, the opportunity to be in touch with people of different competencies and exchange knowledge, experiences and skills

seems to be a significant driver towards community participation and collaborative co-creation.

Most makers indicate as important factors the desire to create, the craftsman identity (i.e., a type of social labelling), the feeling of creating something from start to finish, as well as the enjoyment of socialising and participating in a DIY community. The need for uniqueness and differentiation from other people, as well as the sense of empowerment, open-sharing and learning, creativity, accomplishment, self-improvement, fun and enjoyment that making activities offer, are also considered to be core motivational factors (Collier and Wayment, 2017; Wolf and McQuitty, 2011).

Overall, the motivation for participating in maker initiatives is mostly related to personal and generic objectives such as (i) learning about making, (ii) using making for education and (iii) developing personal projects. Other motivations such as developing collaborative solutions, improving business through making or improving policymaking, appear to be subordinate (MAKE-IT project, 2017).

2.2.2. Challenges in participating in the maker movement

General public individuals or existing makers, however, often have many challenges to overcome before they engage in makerspaces and making activities. Several authors indicate a variety of barriers that affect people's decision to participate in the maker movement. According to relevant studies, makers can be discouraged by the lack of income stemming from these initiatives, the insufficient available information, the lack of mentorship as well as the limited access to tools and materials (Bean et al., 2015; Wittemyer et al., 2014). Besides that, the fear of failure and criticism together with the fear of the unknown are supposed to be among the top challenges.

Moreover, the lack of technical skills seems to be a barrier since *"creating an object from scratch using a digital drawing means is not necessarily a straightforward process".* As such, this process makes it difficult for anyone to walk into a makerspace and start creating immediately (Waldman-Brown et al., 2015). This is in line with another literature source which suggests that the competence of people to execute the necessary tasks will significantly affect their motivation and willingness to join; when a person is willing to actively join the maker movement, he or she should also feel indeed able to join (MAKE-IT, 2017). Some of the potential participants are also concerned about more general contextual aspects, since they perceive makerspaces to be too loud, dusty, and disorganised workspaces. It should also be noted that documented barriers also include the potential absence of clearly defined goals from the making process, as well as the limited awareness of what makerspaces are and what benefits they can provide (Lewis, 2015).

Apart from these general factors identified in literature, previous research has reported additional specific challenges faced by underrepresented social groups. Even though maker initiatives take place mostly at a local or regional scale, they often lack an approach for being more inclusive towards various types of makers (MAKE-IT, 2017). The maker movement gathers rather homogeneous audiences while it appears difficult to attract low socioeconomic or minority groups.

In relation to gender, potentially existing gender gaps (*as also reported in Section 3.1.3.1 – Demographics of the makers*) might arise mostly due to existing norms related to gender imbalances, stereotypes, and biases (Maric, 2018; Bean et al., 2015; Lewis, 2015; Wittemyer et al., 2014). Overall, it seems that makerspaces are a male-dominated environment in which women face difficulties in finding a role. Thus, makerspaces appear to be an environment where female makers participation requires a higher amount of engagement effort. Researchers observe that women underrepresentation within the maker movement is also related to the overriding feeling and/or misconception that women are less interested in technical activities and related careers closely related to STEM (Bean et al., 2015). Further to the above obstacles, female makers struggle to find free time to join makerspaces due to family obligations and lack of child-care (Maric, 2018; Bean et al., 2015).

Gender disparities are not the only issue affecting individuals' involvement in the maker movement. Scholars also report the challenges that people with disabilities face regarding their participation in making activities (Seo, 2019; Stamos et al., 2019). It is highlighted that accessibility problems drive the underrepresentation of this social group which has been generally marginalised in the maker movement. Common issues that people with disabilities, and especially blind makers, could face are

inaccessible and undocumented instructions for maker toolkits, less tangible design of the making board, and lack of multi-sensory modules.

Finally, as also previously mentioned (*Section 2.1.3.1*), participation challenges are also faced by the elderly, people of lower educational level, people with a lack of technical (STEM) skills, unemployed, and people of lower economic status. Researchers further indicate that underrepresented racial and ethnic minorities seem to be less engaged in making activities. However, the reasons for this exclusion have not yet been addressed.

2.2.3. Attitudes towards the maker movement

Regardless of the various barriers towards individuals' inclusion in making activities, the share of people involved in the maker movement has been increased over the last decade (Kwon and Lee, 2017). Makers' insights and perspectives, however, range. Recent reports demonstrate that participation in makerspaces is mostly seen as a free-time activity that offers resourcefulness and empowerment (Rosa et al., 2018; Make and Intel, 2012). As such, makers gather in such places to spend time together with other people, share experiences, knowledge, and passion, and cultivate their hobbies. Furthermore, even though many of the participants see some opportunities for entrepreneurial development within makerspaces, there are only a few cases whereby employment and its related benefits consist real concerns or aspirations for the members of the maker communities.

It is observed that, among makers, there is limited knowledge on how their developed maker projects can create meaningful impact (MAKE-IT project, 2017). Finally, it also seems that there is a considerable share of makers with an aspiration to remain small-scale, holding no desire to grow or sell their businesses, since they connect fast growth with overtaking personal skills, resources, and values. They believe that growth will influence their attachment to a place, as well as their willingness to make a difference in local economies (Wolf-Powers et al., 2016).

Overall, providing skills training, access to digital tools as well as technical support, seem to be the main goals for individuals involved in a makerspace. On the other hand, research indicates that new employment opportunities, supporting of new creative tech start-ups or promotion of the maker technology are not perceived as the main purpose of the making initiatives (Rosa et al., 2018).

3. EU-level Survey Methodological Approach

3.1. Sample

Aiming to update the 1st round survey preliminary insights (reported in D2.1) and in order to achieve the respective iPRODUCE KPI of incorporating at least 3,000 responses (in total) under the T2.1 analysis[5], the 2nd round survey - outcomes of which are reported herein - targeted the broader EU area.

The 1st round survey (March – August 2020) sample was based on 862 responses from the general public, makers, and manufacturers in the 6 iPRODUCE Pilot countries (Denmark, France, Germany, Greece, Italy, and Spain). The survey, translated into local languages, was disseminated online by pilot partners through the, GDPR–compliant, EU survey platform, evaluating stakeholders' perceptions around social manufacturing.

The 2nd round survey, analysed herein, gathered 2,864 responses in total from **27 countries across Europe.** Data cleansing was then conducted routing out speed responses, straightlining[6] (when a respondent consistently choose similar answer options, such as always first or last option etc.) as well as fake or manipulated answers. The validated captured quota eventually included **2,789 responses**. Data collection took place from **March to May 2021** through several waves, in order to monitor responses and ensure the structure and quality of the data. In particular, **the survey was administered in English in EU Survey and was then linked to the crowdsourcing platform Clickworker.**

Instead of resource-intensive methods such as computer-assisted-telephone-interviews (CATI) that would render data collection unduly expensive, to fill-in the quotas, crowdsourcing was selected as the most suitable option to generate a large number of responses in a time- and cost-effective manner. Crowdsourcing platforms, such as Clickworker[7], allow the recruitment of an independent global workforce for the objective of working on a specifically defined task or set of tasks and provide quick and easy access to data from a large number of participants spanning different geographies, age, sex, educational and professional background, interests etc. Moreover, despite primary concerns over the equivalence of online data collection in comparison to traditional methods, evidence suggests that there are no significant differences between the two methods. Administering and collecting such a vast number of responses through field research would have been prohibiting either due to logistical considerations such as time and monetary resources or participants' availability.

3.2. Questionnaire Structure

Survey's questions, identified through the literature review process and after being peer-reviewed by consortium partners, were clustered in 7 main sections, each of which corresponds to dedicated research question(s). With the exception of incorporating an additional set of questions under the "Digital Platform for Social Manufacturing" section, the EU-level, 2nd round, survey follows an identical structure as the one employed in the pilot-level, 1st round, survey (documented in D2.1). Each section and its rationale are presented briefly below:

1. **Introduction to the topic**. This introductory, warm-up section, inquires participants about their knowledge on terms related to the maker movement.
2. **Perceptions**. This section inquires participants about their thoughts on makerspaces.
3. **Barriers**. The purpose of this section seeks to understand the main barriers hindering participation in makerspaces.
4. **Drivers**. This section complements the barriers section by exploring why people would

[5] iPRODUCE KPI-38: Manufacturers, makers and consumers in the needs analysis: >3000
[6] straightliners were identified through a trap question that was incorporated on the survey
[7] Clickworker Crowdsourcing platform *https://www.clickworker.com/clickworker-job/*

participate in a makerspace. In this section, a set of different questions were prepared to separately address (a) makers/consumers and (b) manufacturers.

5. **Digital Platform for Social Manufacturing.** This section collects feedback on the most popular and fit-for-purpose features that a digital platform for social manufacturing, aiming to connect makers, manufacturing SMEs and consumers, should have.

6. **Willingness to join, openness and values**. This section inquires participants about their willingness to be involved or join in social manufacturing activities.

7. **General information.** This section includes basic demographic information such as sex, age, country, place, or residence (e.g., urban or rural area), educational background, occupational status, and others.

All demographic information was collected in compliance with the general data protection regulation (GDPR) of the European Union and was used solely for research and statistical reasons. No natural person can be identified through their demographic information. In addition, to take part in the survey, all research subjects had to agree to the terms and conditions set out to a dedicated consent form that was included in the online survey session. Finally, the management of datasets including such information adheres to the project's data management plan.

The survey is presented in *Annex I*, whereas references to specific questions within the report are cited as "QXX_Y", where "XX_Y" corresponds to the respective question's number.

4. EU-level Survey Analysis

4.1. Descriptive Analysis

4.1.1. Demographics and main variables

This section presents the main findings regarding the descriptive characteristics of the sample and the responses that were collected throughout the 2nd round of the large-scale survey covering all European countries. Starting from the sample's spatial distribution, the total number of responses per country (Q29_1) are given in *Table 1*. As we can see, the Western and Southern Europe have a significantly higher number of responses than Northern and Central Europe. The difference in participation may be due to higher levels of familiarization and active involvement of more technologically developed countries to digital tools, such as crowdsourcing platforms. On the other hand, Northern Europe had the lowest representation in the survey by number of responses. This can be explained by the fact that the northern cluster contained less countries with much fewer population living in this area than the rest of Europe. In the table below an analytical break down of the number of responses collected per country is presented. *Figure 1* presents the corresponding map depicting the country clusters for our sample.

Table 1. Sample distribution by country

	Country	Responses	Percentage
Central Eastern Europe	Bulgaria	47	1.69%
	Croatia	28	1.00%
	Czech Republic	64	2.29%
	Hungary	60	2.15%
	Poland	206	7.39%
	Romania	161	5.77%
	Slovak Republic	37	1.33%
	Slovenia	15	0.54%
	Central Eastern Europe Total	**618**	**22.16%**
Northern Europe	Denmark (*)	23	0.82%
	Estonia	23	0.82%
	Finland	33	1.18%
	Latvia	28	1.00%
	Lithuania	17	0.61%
	Sweden	51	1.83%
	Northern Europe Total	**175**	**6.27%**
Southern Europe	Cyprus	12	0.43%
	Greece (*)	65	2.33%
	Italy (*)	444	15.92%
	Malta	7	0.25%
	Portugal	64	2.29%
	Spain (*)	211	7.57%
	Southern Europe Total	**803**	**28.79%**
Western Europe	Austria	73	2.62%
	Belgium	74	2.65%
	France (*)	402	14.41%
	Germany (*)	483	17.32%
	Ireland	39	1.40%
	Netherlands	122	4.37%
	Western Europe Total	**1,193**	**42.78%**
Total		**2,789**	**100,00%**

* Pilot countries
Source: Authors' calculations

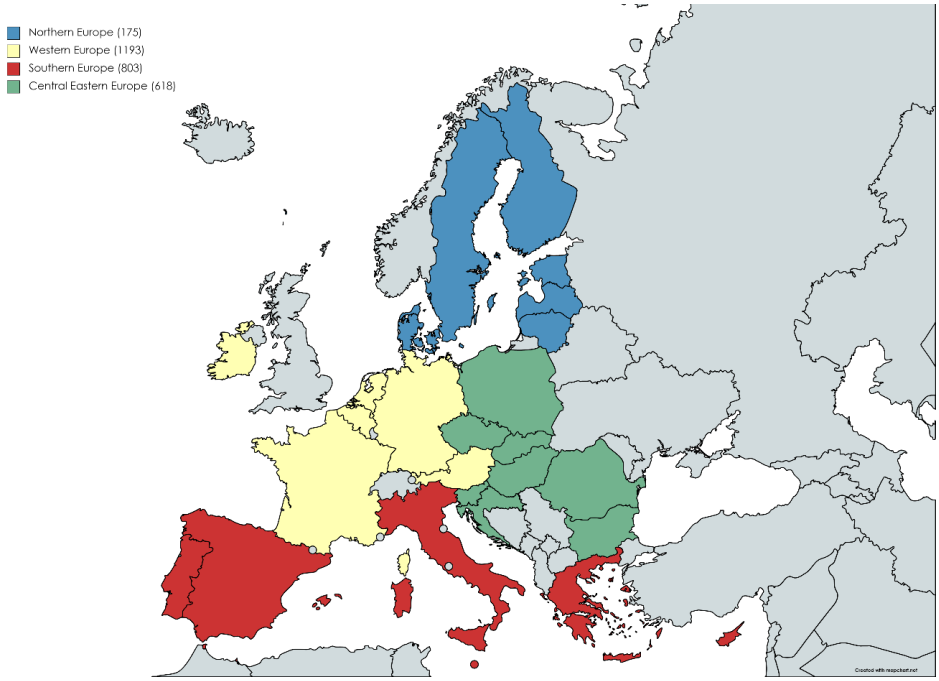


Figure 1. Distribution of the collected responses at European level

Moving one step further, *Table 2* presents the breakdown of responses based on demographic characteristics. We can see that our sample is balanced in terms of gender (51.03% males – 46.43% females) and it follows an almost normal distribution considering age and educational level. As expected, persons between 25-39 years old are highly present in the survey sample (46.34%), together with individuals with tertiary education (66.70% - including all three tertiary education levels).

Table 2. Sample distribution by individual characteristics (gender, age, education, activity status)

Gender	**Count**	**Percentage**
Male	1,473	52.81%
Female	1,316	47.19%
Total	**2,789**	100.00%
Age	**Count**	**Percentage**
< 20	243	8.71%
20-29	1,095	39.26%
30-39	792	28.40%
40-49	425	15.24%
50-59	187	6.70%
60+	47	1.69%
Total	**2,789**	100.00%
Education	**Count**	**Percentage**
Less than a High School Diploma	153	5.49%
High School Diploma	964	34.56%
Bachelor's Degree	955	34.24%
Master's Degree	674	24.17%
Doctorate	43	1.54%
Total	**2,789**	100.00%

Activity Status	Count	Percentage
Employed	1,211	43.42%
Self-employed/entrepreneur	398	14.27%
Unemployed	337	12.08%
Student	710	25.46%
Household activity	71	2.55%
Retired	26	0.93%
Other	36	1.29%
Total	**2,789**	100.00%

Source: Authors' calculations

Table 3 presents the sample distribution in relation to the three typologies including urban, semi-urban and rural areas (Q34). As we can see, most of the participants (44.85%) are located in densely populated areas (urban), whilst people living in rural areas cover 14.84% of total participants. In the case of countries located in Central Eastern Europe we can see that the share of urban residents increases up to 52.10%, whilst the same share is 39.43% in Northern Europe.

Table 3. Sample distribution (%) by typology

	Country	Thinly populated area (rural)	Intermediate area (semi-urban)	Densely populated area (urban)
Central Eastern Europe	Bulgaria	4.26%	27.66%	68,09%
	Croatia	14.29%	35.71%	50,00%
	Czech Republic	15.63%	29.69%	54,69%
	Hungary	18.33%	33.33%	48,33%
	Poland	13.59%	35.92%	50,49%
	Romania	11.80%	30.43%	57,76%
	Slovak Republic	29.73%	35.14%	35,14%
	Slovenia	33.33%	53.33%	13,33%
	CE-EU Total	**14.56%**	**33.33%**	**52,10%**
Northern Europe	Denmark	17.39%	43.48%	39,13%
	Estonia	17.39%	30.43%	52,17%
	Finland	12.12%	51.52%	36,36%
	Latvia	17.86%	57.14%	25,00%
	Lithuania	5.88%	47.06%	47,06%
	Sweden	9.80%	49.02%	41,18%
	N-EU Total	**13.14%**	**47.43%**	**39,43%**
Southern Europe	Cyprus	16.67%	50.00%	33,33%
	Greece (*)	13.85%	23.08%	63,08%
	Italy	18.20%	40.90%	40,90%
	Malta	0.00%	42.86%	57,14%
	Portugal	4.69%	26.56%	68,75%
	Spain (*)	6.64%	45.50%	47,87%
	S-EU Total	**13.56%**	**39.68%**	**46,77%**
Western Europe	Austria	24.66%	28.77%	46,58%
	Belgium (*)	12.16%	54.05%	33,78%
	France	18.20%	38.15%	43,64%
	Germany	15.32%	47.00%	37,68%
	Ireland	15.38%	48.72%	35,90%
	Netherlands (*)	9.84%	45.90%	44,26%
	W-EU Total	**16.11%**	**43.29%**	**40,60%**
Total		**14.84%**	**40.30%**	**44.85%**

*Note: Semi-Urban areas include persons living in suburbs and towns.
Source: Authors' calculations

When decomposing our sample based on the different stakeholder groups that participated in our survey (*Figure 2*), we can see that most responses come from general public (consumers), covering 82.43% of our total sample. In the case of the other two stakeholder categories, makers and maker communities cover 8.28% of our sample whereas participants referring to manufacturing SMEs and industry reflect a share of 9.29%, as depicted below.

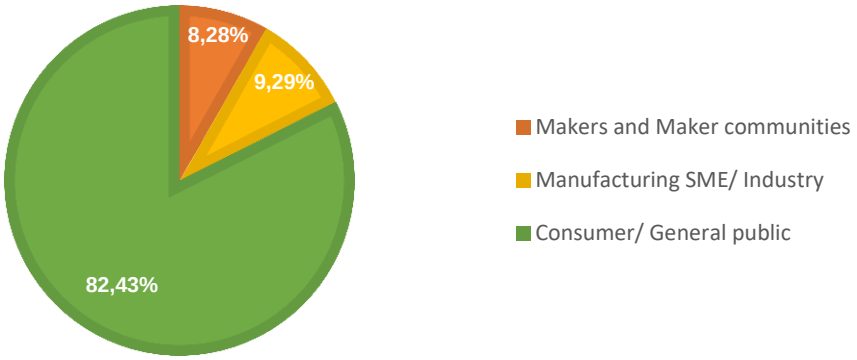


Figure 2. Stakeholder groups per pilot country

4.1.2. Familiarity with terms around social manufacturing

Regarding the familiarity of survey participants with the terms "*DIY manufacturing*", "*makerspace*", "*Fablab*", "*manufacturing facility*", "*co-creation*", and "*social manufacturing*" (Q1_1 – Q1_6), results indicate that many respondents are acquainted with some of the provided terminology, as shown in *Figure 3*. The most well-known term is "*DIY manufacturing*", as a significant share of our sample (45.43%) appears to be very familiar with it. The terms "*manufacturing facility*" and "*co-creation*" seem to be less known among participants, as decreased shares of good familiarity (13.52% and 17.53% respectively) are observed. A 11.58% share of our sample is very familiar with "*social manufacturing*", whereas the terms "*makerspace*" and "*Fablab*" score the lowest familiarity levels amongst survey participants (9.32% and 6.74% respectively). In fact, a significant share of them is even not at all familiar with these terms (29.87% and 46.47% respectively).

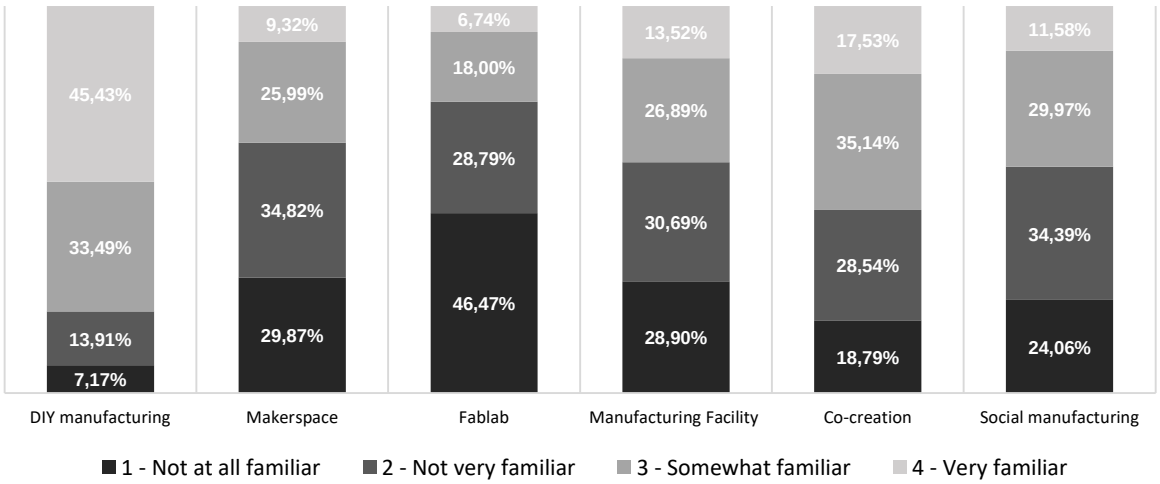


Figure 3. Levels of familiarity with terms related to the maker movement

Focusing on those respondents that are relatively familiar with the concept of social manufacturing, we further asked them to specify the type of relationship they have experienced with a makerspace or a Fablab (Q3_2). As depicted in *Figure 4,* the most common answer by survey participants refers to the fact that they have heard of the concept of either makerspaces or Fablabs (52.76%). Having a friend/acquaintance who is a maker or has participated in a maker activity constitutes an additional aspect (22.24%), followed by having participated in a making activity (15.55%) or used a makerspace/Fablab to develop a project (7.56%).

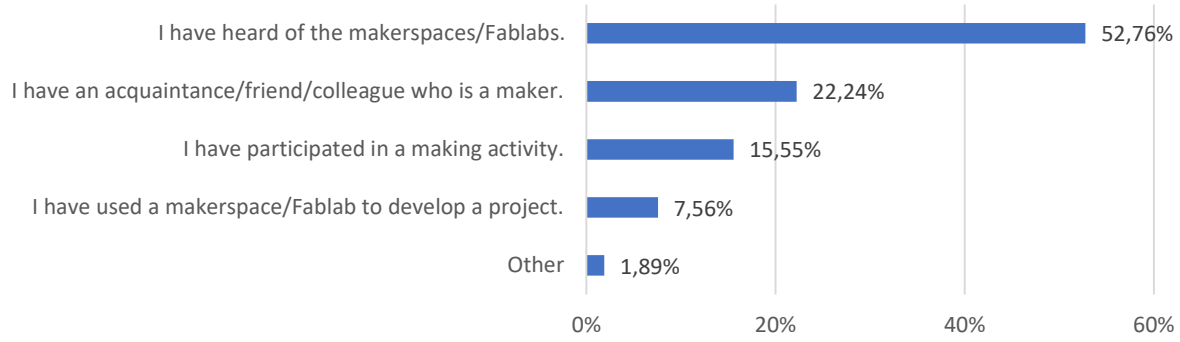


Figure 4. Type of existing relationship with a makerspace or Fablab

A more detailed presentation of these results is given in *Table 4*, illustrating the mean familiarity by individual characteristics' breakdown. As we can see, there are several differences between the six terms under investigation. As expected, mean familiarity reaches a peak in all cases when referring to "*DIY manufacturing*", whereas the lowest scores are observed in the case of the "*Fablab*" term, as it seems that the term "*Fablab*" is not popular in any of the identified demographic groups.

There are no significant gender gaps in the under-investigation terms, as mean familiarity levels are similar between males and females. At the same time, the 50-59 year old group is less acquainted with all terms based on mean familiarity comparisons to younger or older age groups. Similarly, it seems that the level of familiarity does not significantly vary between the various educational groups. However, it is interesting to notice that only in the case of the term "*social manufacturing*" we can see that there is a significant gap between the highest familiarity level related to persons with high school diploma (2.34) and persons possessing a PhD degree (1.84).

With regard to occupational status, it is clear that participants in retirement are in general less familiar with all terms. We should, however, note that the overall sampling in this category was low and therefore these insights are not statistically representative. In the case of the terms "*DIY manufacturing*" and "*co-creation*", there seems to be a common understanding between the different employment categories. In almost all cases, employed and self-employed persons are the ones that have higher levels of familiarity with the examined terms.

Table 4. Mean familiarity of key terms by spatial and individual characteristics

	DIY manufacturing	makerspace	Fablab	manufacturing facility	co-creation	social manufacturing
Gender						
Male	3.10	2.17	1.90	2.30	2.46	2.30
Female	3.25	2.12	1.79	2.19	2.57	2.28
Age						
< 20 years	3.17	2.05	1.80	2.22	2.55	2.45
20-29 years	3.23	2.15	1.91	2.33	2.68	2.38
30-39 years	3.12	2.20	1.85	2.21	2.44	2.26
40-49 years	3.16	2.15	1.76	2.23	2.39	2.16
50-59 years	3.06	2.01	1.71	2.05	2.17	2.05
60 + years	3.13	2.19	1.98	2.13	2.28	2.13

	DIY manufacturing	makerspace	Fablab	manufacturing facility	co-creation	social manufacturing
Education						
Less than a High School Diploma	3.05	2.00	1.72	2.27	2.34	2.27
High School Diploma	3.20	2.09	1.80	2.24	2.47	2.34
Bachelor's Degree	3.19	2.21	1.86	2.25	2.58	2.30
Master's Degree	3.15	2.18	1.93	2.27	2.54	2.24
Doctorate	2.91	2.12	1.93	2.09	2.16	1.84
Occupation status						
Employed	3.12	2.24	1.89	2.31	2.48	2.28
Self-employed / entrepreneur	3.26	2.14	1.84	2.20	2.48	2.27
Unemployed	3.17	2.04	1.72	2.23	2.47	2.20
Student	3.24	2.06	1.87	2.23	2.64	2.36
Household activity	3.15	2.30	1.85	2.01	2.41	2.42
Retired	3.00	1.92	1.69	2.00	2.23	2.23
Other	2.94	1.83	1.67	2.06	2.53	2.06

Source: Authors' calculations

4.1.3. Previous experience in a collaborative project

Participants were also asked (Q6) to indicate whether they have had previous experience in a collaborative project, involving makers and manufacturing SMEs. Results indicate that only a small share (10.47%) of the respondents has had previous experience with the maker movement (*Figure 5*). In order to get a better understating regarding the variation of this share between different demographic groups, we chose to decompose the previous experience variable into its main demographic groups.

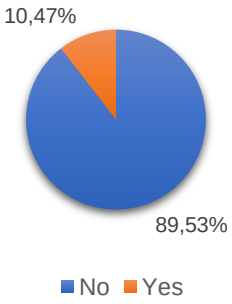


Figure 5. Previous experience in a collaborative project

Table 5 presents the main findings regarding previous experience decomposition between different socio-demographic groups. It appears that the share of male participants with previous experience in a collaborative project is slightly higher (12.63%) than the respective share of female respondents (8.05%). With regard to age groups, persons between 20-29 and 30-39 years old indicate the highest shares of experience (11.78% and 11.99% respectively). In terms of educational level, people primary and secondary education appear to be less experienced (9.80% and 8.20% respectively) around collaborative/making projects, compared to the shares of the rest of the educational level groups. It is interesting to notice that people holding a PhD have 23.26% previous experience in a collaborative project which is more than two times higher compared to primary and secondary education participants. Our sample analysis further indicates that more than 5.64% of people being unemployed have indeed acquired a relevant experience around hands-on working on collaborative projects. More specifically, employed people appear to be more experienced (13.46%) with the maker movement, alongside self-employed persons (10.30%), compared to the relevant shares of the rest of the occupational categories (e.g., students, retired).

Table 5. Previous experience shares (%) by individual characteristics

	No	Yes	Total
Gender			
Male	87.37%	12.63%	100.00%
Female	91.95%	8.05%	100.00%
Age			
< 20 years	90.12%	9.88%	100.00%
20-29 years	88.22%	11.78%	100.00%
30-39 years	88.01%	11.99%	100.00%
40-49 years	91.53%	8.47%	100.00%
50-59 years	97.33%	2.67%	100.00%
60 + years	93.62%	6.38%	100.00%
Education			
Less than a High School Diploma	90.20%	9.80%	100.00%
High School Diploma	91.80%	8.20%	100.00%
Bachelor's Degree	89.21%	10.79%	100.00%
Master's Degree	87.39%	12.61%	100.00%
Doctorate	76.74%	23.26%	100.00%
Occupational Status			
Employed	86.54%	13.46%	100.00%
Self-employed / entrepreneur	89.70%	10.30%	100.00%
Unemployed	94.36%	5.64%	100.00%
Student	91.27%	8.73%	100.00%
Household activity	90.14%	9.86%	100.00%
Retired	100.00%	0.00%	100.00%
Other	100.00%	0.00%	100.00%

Source: Authors' calculations

Our analysis further investigated the relationship between educational level (Q30) and previous experience with maker movement (Q6). *Figure 6* presents the distribution of the previous experience shares between the different educational levels, investigated in order to compare our findings with the similar outcomes of the 1st round of the survey. It becomes evident that in the case of the EU-level survey we have a change in the pattern between the educational level and the previous experience around making/collaborative projects, as higher tertiary education (Doctorate degree) seems to be a dominant force related to higher shares of previous experience this time.

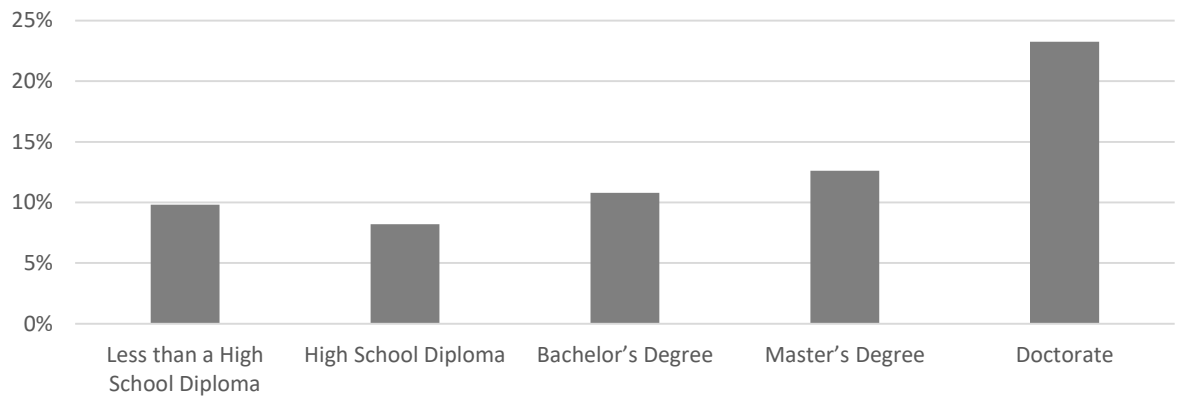


Figure 6. Shares (%) of previous experience with the maker movement by educational level

4.1.4. Perceptions towards participation in makerspaces

In order to get a better understanding on the perceptions of the different stakeholder groups regarding their participation in makerspaces (Q12), *Table 6* provides the main results from our 2nd round survey. As we can see, makers and consumers are the two groups of stakeholders that indicate an increased enthusiasm towards the benefits of makerspaces and Fablabs and the positive impact that they may bring to local community. More specifically, we can see that 23.38% of makers and 28.75% of consumers strongly disagree with the fact that participation in makerspaces and Fablabs does not provide any benefits (Q12_1). At the same time these groups showed increased levels of strong agreement with the statement that participation in makerspaces and Fablabs *will* have a positive impact on their local area - 23.38% and 22.36% for makers and consumers respectively (Q12_4). Industry actors show a more conservative attitude towards these two elements (17.76% strongly disagree in Q12_1 – 20.85% strongly agree in Q12_4).

Regarding the other two items included in this question, makers show a higher hobbyist attitude towards makerspaces and Fablabs, as expected (7.36% strongly agree with this statement), whereas at the same time, makers and consumers are those who also indicate increased strong agreement with the understanding of makerspaces as places that may open new professional opportunities (28.14% and 26.92% respectively). In general, we can see that there is an increased attitude towards makerspaces as places for collaborative production and professional opportunities, compared to places for hobby. Again, persons from manufacturing SMEs and industry indicate, in both cases, a more conservative approach towards these initiatives.

Table 6. Results regarding perceptions for participating in makerspaces – stakeholder groups

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Grand total
Q12_1 - Participation in makerspaces and Fablabs does not provide any benefits						
Total Sample	**27.29%**	**30.84%**	**27.54%**	**10.90%**	**3.44%**	**100.00%**
Makers and Maker communities	23.38%	30.74%	22.51%	18.18%	5.19%	100.00%
Manufacturing SME/ Industry	17.76%	27.41%	32.05%	17.37%	5.41%	100.00%
Consumer/ General public	28.75%	31.23%	27.53%	9.44%	3.04%	100.00%
Q12_2 - Participation in makerspaces and Fablabs is something that should be considered as a hobby						
Total Sample	**6.78%**	**19.83%**	**43.46%**	**23.45%**	**6.49%**	**100.00%**
Makers and Maker communities	9.09%	15.58%	39.83%	28.14%	7.36%	100.00%
Manufacturing SME/ Industry	3.86%	20.46%	40.15%	28.57%	6.95%	100.00%
Consumer/ General public	6.87%	20.18%	44.19%	22.40%	6.35%	100.00%
Q12_3 - Participation in makerspaces and Fablabs opens up new professional opportunities						
Total Sample	**1.40%**	**4.41%**	**20.26%**	**47.47%**	**26.46%**	**100.00%**
Makers and Maker communities	1.73%	5.19%	19.05%	45.89%	28.14%	100.00%
Manufacturing SME/ Industry	1.54%	12.36%	26.64%	38.61%	20.85%	100.00%
Consumer/ General public	1.35%	3.44%	19.66%	48.63%	26.92%	100.00%
Q12_4 - Participation in makerspaces and Fablabs will have a positive impact on my local area						
Total Sample	**2.12%**	**6.45%**	**29.83%**	**39.69%**	**21.91%**	**100.00%**
Makers and Maker communities	3.03%	4.76%	25.97%	42.86%	23.38%	100.00%
Manufacturing SME/ Industry	3.47%	13.51%	34.75%	31.66%	16.60%	100.00%
Consumer/ General public	1.87%	5.83%	29.67%	40.28%	22.36%	100.00%

Source: Authors' calculations

4.1.5. Preferred types of activities and respondents' fields of experience

In order to better understand the main type of activities that would attract the respondents' interest, through their potential participation in a makerspace or a Fablab, we analysed the answers received from question Q4_1: "*What type of activities would you be interested in, in relation to makerspaces and Fablabs?*". As showcased in *Table 7*, the most popular activities for the total sample and consumers related to makerspaces include photography and cinematography (16.20%) and handcraft

activities (14.11%). In the case of makers and maker communities, photography and cinematography remain on top (15.52%), followed by digital fabrication tools (laser cutting, CNC milling and 3D printing) (12.77%). Finally, when it comes to participants coming from manufacturing SMEs and industry, activities related to more professionally oriented perspectives are on the top of the preferences list, including woodworking (11.34%), information technologies (13%), software programming (10.65%) and hardware (10.65%). Agile methods (ideation, paper prototyping, design thinking), electronics prototyping, and metalworking are found in all cases at lower places in the list.

Table 7. Types of activities that survey respondents would wish to implement through their potential participation in makerspaces or Fablabs

	Total sample	Makers and Maker communities	Manufacturing SME/ Industry	Consumer/ General public
Photography, cinematography	16.20%	15.52%	13.00%	16.62%
Handcraft	14.11%	10.99%	8.99%	14.99%
Woodworking	10.99%	9.48%	11.34%	11.11%
Digital fabrication tools	10.58%	12.77%	9.82%	10.43%
Information technologies	10.07%	9.20%	13.00%	9.85%
Software programming	9.79%	9.34%	10.65%	9.75%
Agile methods	7.45%	7.83%	4.01%	7.77%
Electronics prototyping	7.20%	8.65%	9.82%	6.77%
Hardware, machining	6.68%	8.52%	10.65%	6.06%
Metalworking	6.12%	7.28%	8.44%	5.75%
Other	0.80%	0.41%	0.28%	0.90%
Total	100.00%	100.00%	100.00%	100.00%

Source: Authors' calculations

Our data also offered us the opportunity to provide some additional insights regarding a list of preferred activities that is related to makerspaces and Fablabs. To this end, we examined the participants' preferences in relation to how they would like to "*work with their hands*" during their free time (Q2). Analysed responses, depicted in *Table 8* indicate that at least 1 out of 4 participants shares a passion for fixing things using hands. Hobbies related to crafting or fixing furniture, making toys or clothes, designing, and drawing as well as playing with electronics and 3D printers were among the top preferred options in this list. Coding and producing software are at the bottom of the list for all stakeholder categories. Overall, we can see that there is a common response between the different stakeholder groups.

Table 8. Preferred free time activities - "working with hands" (Q2)

	Total sample	Makers and Maker communities	Manufacturing SME/ Industry	Consumer/ General public
Fix things around the house (e.g., car, bike)	22.87%	22.34%	22.93%	22.93%
Hobbies (e.g., building models, furniture, toys/clothes)	21.81%	21.59%	22.28%	21.79%
Design/draw/paint	17.28%	17.24%	16.10%	17.41%
Other related activity that involves working with hands	14.73%	11.54%	10.73%	15.51%
Play with electronics, 3D printers	13.11%	15.59%	17.40%	12.38%
Code (produce software)	7.43%	10.04%	8.94%	6.98%
I do not like to work with my hands	2.76%	1.65%	1.63%	3.01%
Total	100.00%	100.00%	100.00%	100.00%

Source: Authors' calculations

Aiming to further shed light on makerspaces' potential participants profiles and inclinations around collaborative manufacturing activities and processes, we further examined the survey participants' fields of expertise per stakeholder group, as recorded in Q8_1. Analysed answers, presented in *Table 9,* indicate that the sectors better aligned to the total respondents' background include the fields of electronics (14.19%), arts (12.72%), accessories (11.62%) and clothing/textiles (11.24%). This applies both for consumers and makers. Specifically, for the case of stakeholders coming from manufacturing SMEs and industry there is a differentiation in the most relevant sectors, as they include electronics (12.42%), furniture (9.11%), mechanics (10.60%) and automotive (10.10%).

Table 9. Sectors relevant to the survey participants' field of expertise (Q8_1)

	Total sample	Makers and Maker communities	Manufacturing SME/ Industry	Consumer/ General public
Electronics	14.09%	14.86%	12.42%	14.19%
Art	11.76%	10.82%	4.47%	12.72%
Accessories	11.09%	10.68%	6.95%	11.62%
Clothing, textiles	10.41%	9.24%	4.47%	11.24%
Furniture	6.73%	8.08%	9.11%	6.29%
Medicine/Health	6.49%	4.47%	5.96%	6.82%
Other	6.11%	2.45%	3.64%	6.87%
Packaging	5.45%	5.34%	8.44%	5.13%
Wearables	5.39%	5.63%	5.13%	5.39%
Mechanics	5.17%	5.77%	10.60%	4.46%
Mobility	4.83%	5.34%	6.62%	4.56%
Automotive	4.75%	4.76%	10.10%	4.14%
Prototyping	3.89%	6.64%	7.28%	3.13%
Microelectronics/ nanoelectronics	3.82%	5.92%	4.80%	3.44%
Total	100.00%	100.00%	100.00%	100.00%

Source: Authors' calculations

4.1.6. Willingness to join a makerspace

Before moving to the statistical analysis, we also chose to present, at this point, a series of descriptive results regarding the survey participants' willingness to be involved in makerspaces or Fablabs based on the different types of stakeholders. Participants' overall perception with regard to taking part in a social manufacturing project is related to Q20_1, that directly examines survey respondents' willingness to be involved in a makerspace/Fablab. As depicted in *Figure 7*, most of the participants in all stakeholder groups are willing to be involved in a makerspace or Fablab. It is interesting to notice that the **higher levels of strong agreement are found in the case of makers and maker communities** (25.54%), whereas the lowest share of strong agreement refers to participants from manufacturing SMEs and industry (15.44%).

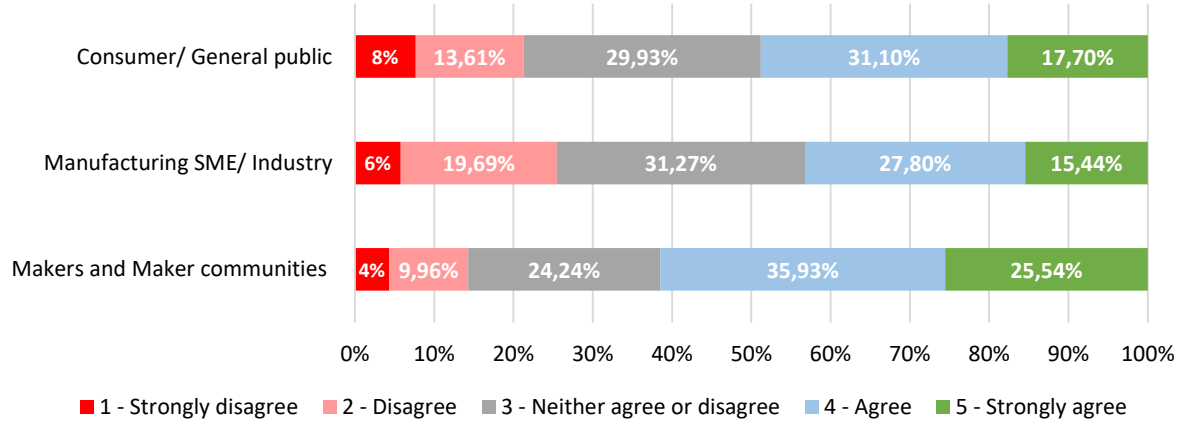


Figure 7. Willingness to be involved in a makerspace or Fablab

Table 10 presents in more detail the differences between the varying stakeholder groups' beliefs for all the different items introduced in Q20 (*Q20_1: be involved in a makerspace or Fablab, Q20_2: be involved in social manufacturing activities, Q20_3: participate in workshops and projects for digital modelling and fabrication, Q20_4.: use a digital platform to access to digital tools, receive training, share my ideas*).

When comparing the 2nd round survey total sample results with the ones derived from the 1st round survey, we can see that there are no significant differences. However, the large number of participants in this survey helped us to better calibrate the derived results for the different stakeholder groups, in which we can find some significant variations between the 1st and the 2nd round surveys. By taking a closer look in *Table 10*, we can see that being involved in a makerspace or Fablab received the lowest shares of agreement between the four items included in Q20 with a share of 49.33% (31.19% agree and 18.14% strongly agree). This share (sum of "agree" and "strongly agree" shares) increases when considering participation in social manufacturing activities (55.25%) and in workshops and projects for digital modelling and fabrication (56.58%). Moreover, participants seem to be strongly in favour towards the use of a digital platform to access to digital tools, receive training and share ideas (63.11%).

Table 10. Willingness to join a makerspace – stakeholder groups

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Grand total
Q20_1: be involved in a makerspace or Fablab						
Total Sample	**7.21%**	**13.88%**	**29.58%**	**31.19%**	**18.14%**	**100.00%**
Makers and Maker communities	4.33%	9.96%	24.24%	35.93%	25.54%	100.00%
Manufacturing SME/ Industry	5.79%	19.69%	31.27%	27.80%	15.44%	100.00%
Consumer/ General public	7.66%	13.61%	29.93%	31.10%	17.70%	100.00%
Q20_2: be involved in social manufacturing activities						
Total Sample	**5.70%**	**11.12%**	**27.93%**	**36.18%**	**19.07%**	**100.00%**
Makers and Maker communities	2.60%	9.52%	23.38%	37.23%	27.27%	100.00%
Manufacturing SME/ Industry	4.63%	13.90%	35.52%	31.27%	14.67%	100.00%
Consumer/ General public	6.13%	10.96%	27.53%	36.62%	18.75%	100.00%
Q20_3: participate in workshops and projects for digital modelling and fabrication						
Total Sample	**6.31%**	**11.40%**	**25.71%**	**33.70%**	**22.88%**	**100.00%**
Makers and Maker communities	2.60%	8.66%	22.94%	38.96%	26.84%	100.00%
Manufacturing SME/ Industry	5.41%	11.97%	35.52%	27.80%	19.31%	100.00%
Consumer/ General public	6.79%	11.61%	24.88%	33.84%	22.88%	100.00%
Q20_4.: use a digital platform to access to digital tools, receive training, share my ideas						
Total Sample	**4.98%**	**9.00%**	**22.91%**	**34.71%**	**28.40%**	**100.00%**
Makers and Maker communities	2.60%	6.06%	22.51%	35.93%	32.90%	100.00%
Manufacturing SME/ Industry	4.25%	13.51%	30.89%	31.66%	19.69%	100.00%
Consumer/ General public	5.31%	8.79%	22.05%	34.93%	28.93%	100.00%

Source: Authors' calculations

It is interesting to notice that there is a common pattern between these four items (Q20_1 – Q20_4). Makers and maker communities are the most enthusiastic indicating the highest levels of willingness amongst the stakeholder groups, whereas participants from manufacturing SMEs and industry are more reluctant for participating in that kind of activities. A graphic representation of these results is given in *Figure 8* below.

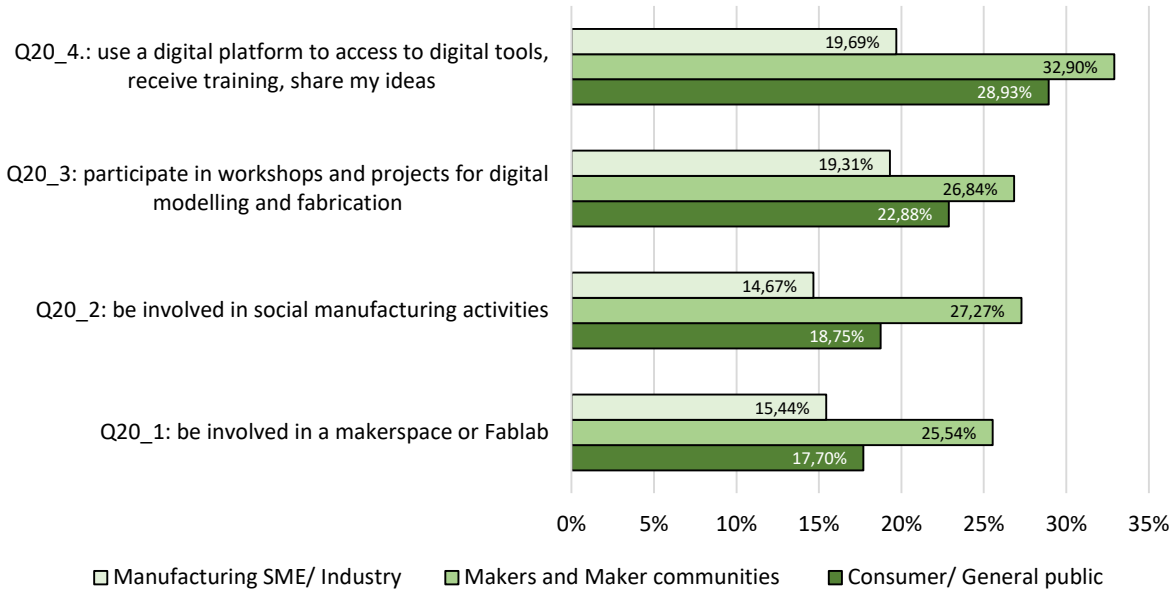
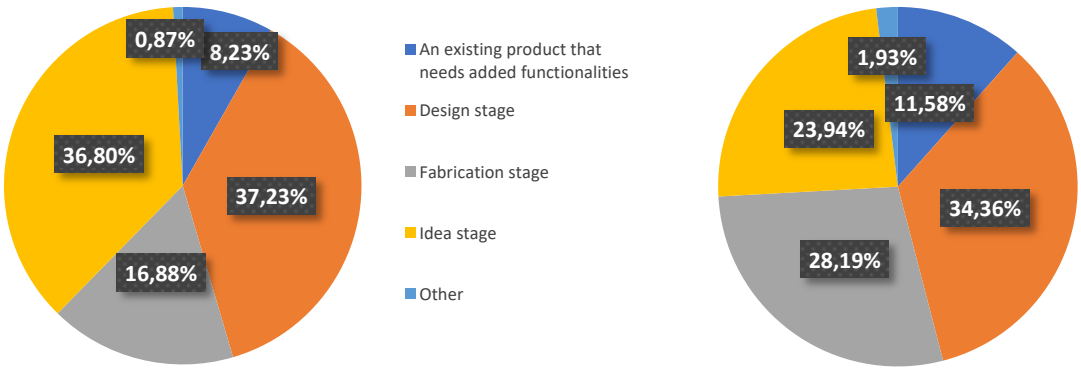


Figure 8. Willingness to join a makerspace: stakeholder groups (displayed option: Strongly agree)

Apart from examining the stakeholders' willingness to be involved in a social manufacturing project, makers and manufacturers were also asked (Q9 and Q10 respectively) to indicate the maturity stage (e.g., idea stage, design stage, fabrication stage) of their potentially existing or upcoming project/service, during which they would be willing to join a makerspace, utterly aiming to collaboratively reach (develop) a final outcome. As depicted in *Figure 9*, maker participants mostly place themselves at the idea or design stages (36.80% and 37.23% respectively). The majority of the manufacturers' population would join a makerspace over either the design or the fabrication stage of a product or service (34.36% and 28.19% respectively).



(a) Makers (b) Manufacturers

Figure 9. Stage of projects that (a) makers and (b) manufacturers would be interested to develop through a makerspace/Fablab.

4.1.7. Preferred features in a Digital Platform for Social Manufacturing

As stated in the previous version of the deliverable, one of the core tasks in iPRODUCE is the establishment of a new Digital Platform for Social Manufacturing that will connect makers, manufacturing SMEs, and consumers. Aiming to develop a platform that would better respond to the preferences of the project's stakeholders, we seized the opportunity and included a relevant survey

question (Q21), addressing respondents' potential needs. Survey participants were specifically asked to prioritize their needs by indicating how essential a series of suggested features would be in a digital platform for social manufacturing (Q21: *"Which of the following features do you consider necessary in a Digital Platform (Web) for Social Manufacturing? [choose to what extent each feature is crucial, 1=Not at all, 5=Extremely crucial]"*).

As depicted in *Figure 10*, tools for offering training activities (Q21_5) to enhance skills on how to use Fablabs' tools and machinery and easy-to-use digital tools (Q21_1), such as design thinking tools and AR/VR modelling are considered among the most important digital features in a web platform for social manufacturing across all stakeholder groups**.** Moreover, digital tools for technical lectures and mentoring from qualified experts (Q21_4) are also of significant importance when considering the design of the platform. On the contrary, services related to inspection and metrology tools for quality control (Q21_3) seem not to attract a lot of attention amongst survey participants.

It is interesting to notice that in some cases there is an essential gap between the different stakeholder groups. More specifically, when it comes to social network tools (Q21_6) *Figure 10* shows that participants from manufacturing SMEs and industry do not find them extremely crucial in a Digital Platform for Social Manufacturing (~15%), whereas the respective share of makers and consumers is much higher in both cases (around 25%). The same also applies for digital tools referring to providing lists of makerspaces/Fablabs' manufacturing equipment (Q21_2). A more targeted and thorough analysis regarding the significance of each digital tool for the online platform is given in the statistical analysis section (4.2.4).

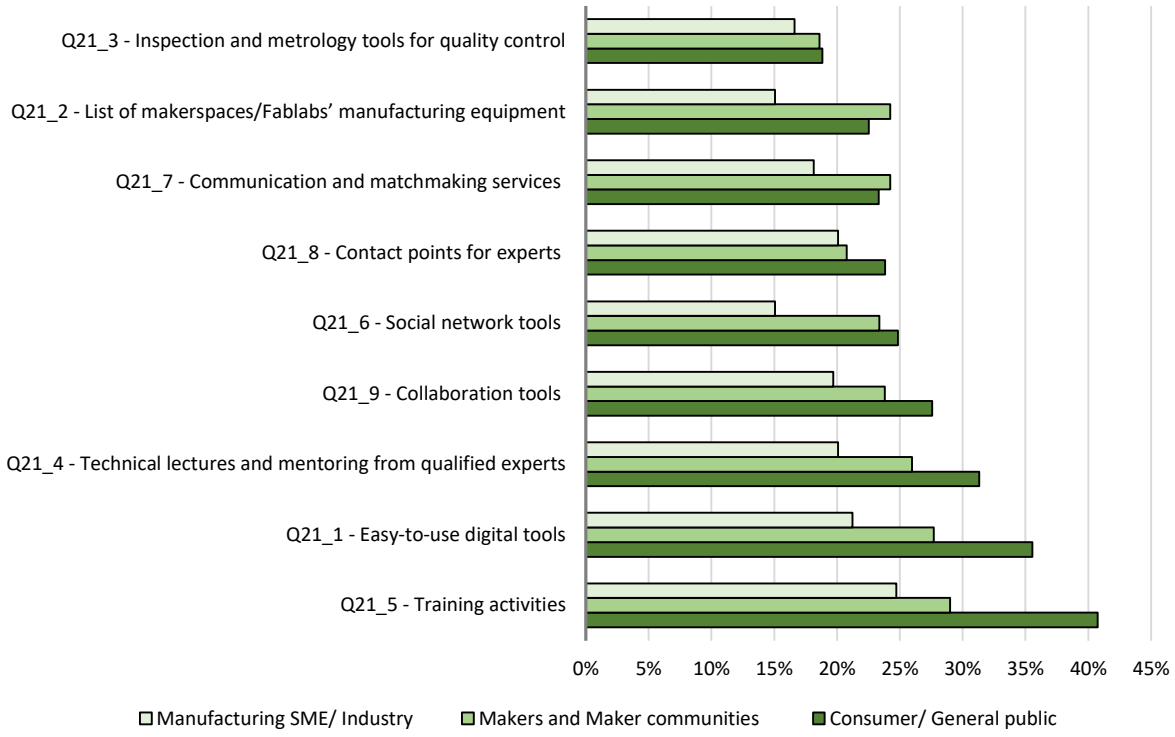


Figure 10. Features considered to be extremely crucial in a Digital Platform for Social Manufacturing

4.1.7.1. Management of Intellectual Property Rights (IPR)

While investigating which digital features are considered to be essential, survey participants were further asked whether management of Intellectual Property Rights (IPR) should be addressed in a web platform for social manufacturing. Results indicate that, among all stakeholders groups, it is mostly makers and maker communities who indicate a more positive attitude towards including IPR management services for safeguarding their projects (*Figure 11*).

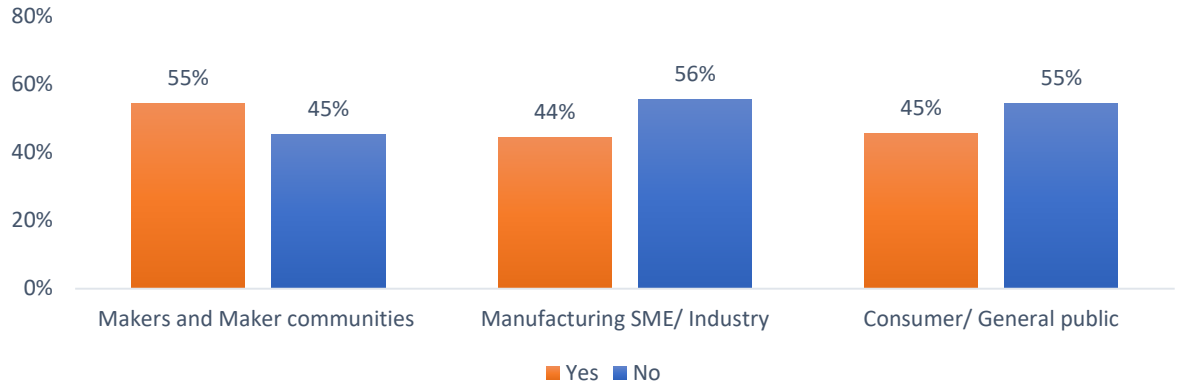


Figure 11. Should IPR management be addressed in a Digital Platform for Social Manufacturing?

Participants interested in accessing an IPR management service within a digital platform for social manufacturing were further asked to define which IPR type would better reflect their individual needs. As depicted in *Figure 12*, it appears that copyright and patents are the top aspects among the different stakeholder groups. In general, we can see a common pattern between makers and manufacturers, whilst consumers (general public) seem to be more positive towards smart contracts and less attracted to trademarks compared to the other stakeholder groups.

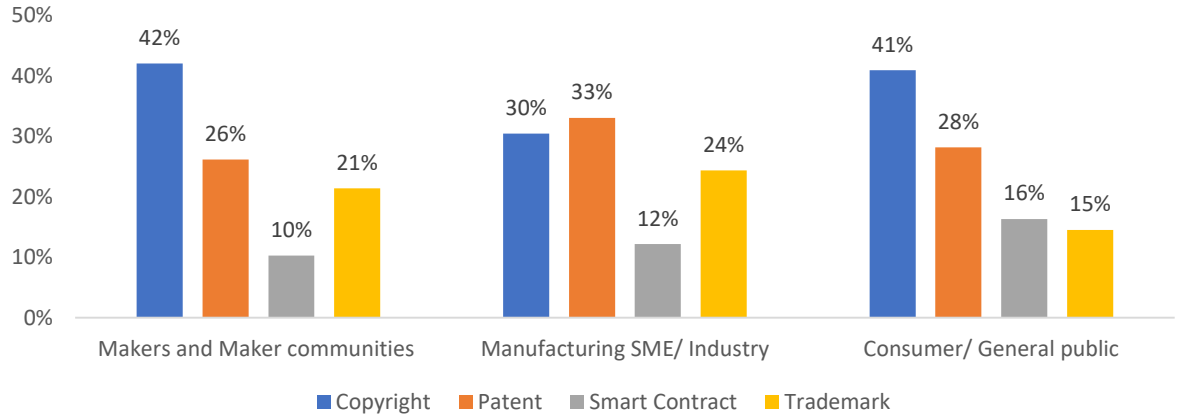


Figure 12. Preferred IPR type in a Digital Platform for Social Manufacturing

4.1.7.2. Matchmaking & Collaboration

The 2nd survey round further offered us the opportunity to investigate, in more detail, the types of matchmaking activities that the project's stakeholders would like to be performed. Starting from the aspects that survey participants would consider helpful when searching for suitable partners online (Q23), *Figure 13* presents the main findings, clustered by stakeholder type. As we can see, development of matchmaking events based on common skills/know-how and location are considered essential for makers and consumers, whereas implementing matchmaking activities based on technologies is very crucial when it comes to manufacturing SMEs/industry and makers. Additional technical aspects that are important for these two groups include equipment and materials used. The type of products constitutes a common aspect highlighted by all stakeholder groups, whilst the importance of the type of activity is stressed only by makers and consumers. Finally, services provision and certification are two aspects that are considered essential mostly by manufacturing SMEs and industry.

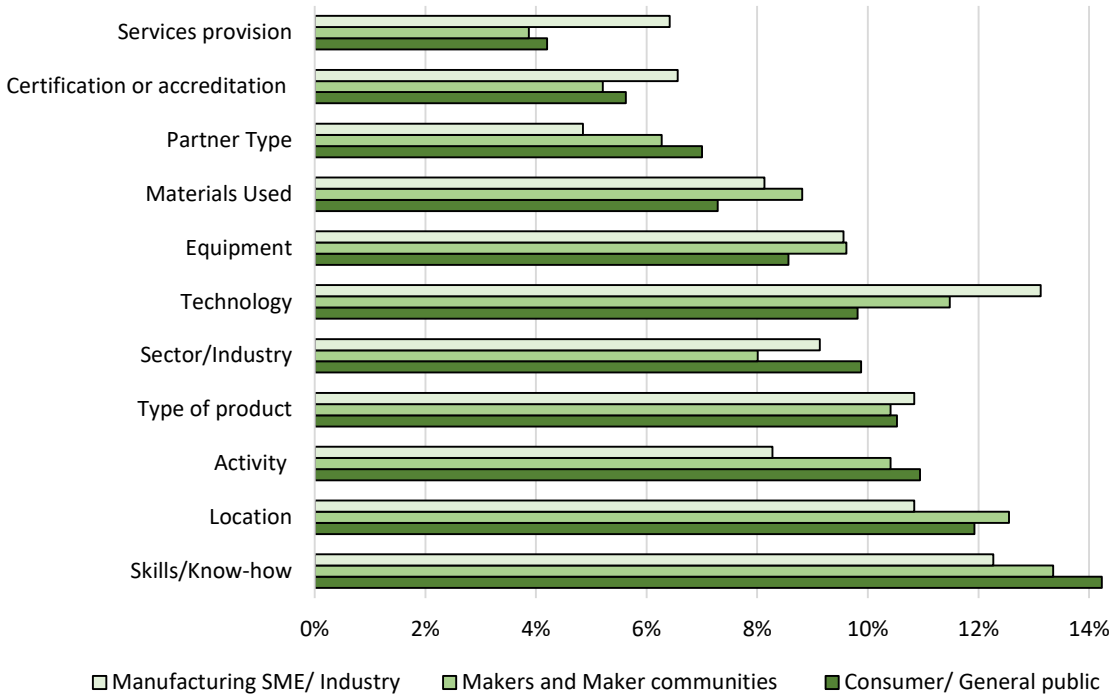


Figure 13. Aspects considered helpful when designing matchmaking activities

An additional insight captured during the 2nd survey round includes the type of criteria that participants consider essential when selecting partners online for their collaborative project (Q24). *Figure 14* shows that there are some noticeable differences between the various stakeholder groups. Previous experience or past relationship with a partner is an important factor in the case of consumers (31.42%) and makers (28.92%). At the same time, certification or accreditation indicates increased significance (35.19%) for participants coming from manufacturing SMEs respondents, who also seem to positively consider location (e.g., same city or country) as another important criterion (30.25%). Partner type (e.g., individual, SME, large company) seems to be less important for selecting online for a collaborative project in all stakeholder groups.

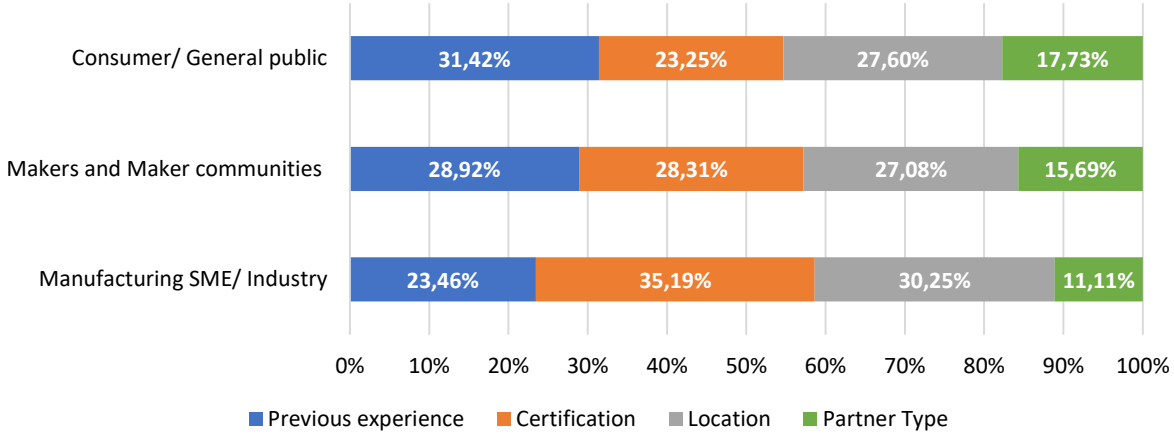


Figure 14. Criteria for selecting partners online for a collaborative project per stakeholder group

When it comes to preferable ways for managing collaboration is a social manufacturing project (Q25), *Figure 15* indicates that emails constitute the most essential channel for boosting collaboration, especially in the case of manufacturing SMEs and industry (33.57%). Consumers also find digital

collaboration tools (such as Slack, Microsoft Teams, Google Meet, etc.) favourable for collaboration (27.30%), whereas face to face meetings and phone/internet calls are highlighted mostly by makers and maker community participants (23.04% and 25.28% respectively).

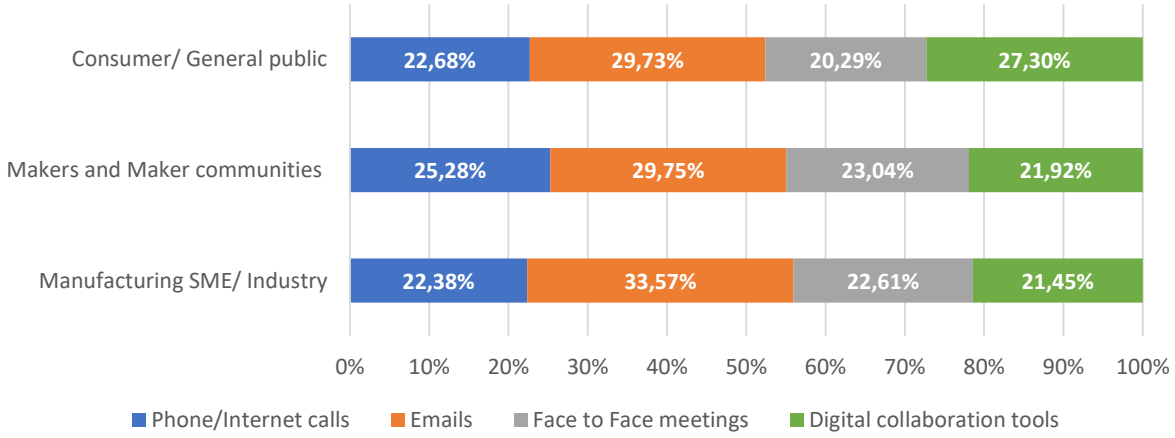


Figure 15. Tools for managing activities in collaborative networks per stakeholder group.

In addition, the 2nd round survey further investigated the prioritization of those activities for which collaboration with partners is required (Q26). As depicted in *Figure 16*, information technologies and software programming are commonly considered as high-priority collaboration activities by all stakeholder types. Electronic prototyping and photography are mostly highlighted by makers and industrial or SMEs actors, whereas digital fabrication tools and hardware/machining are stressed as highly collaborative activities by makers and consumers. Agile management seems to be identified as the least essential activity for collaboration; a point unanimously raised by all stakeholder groups.

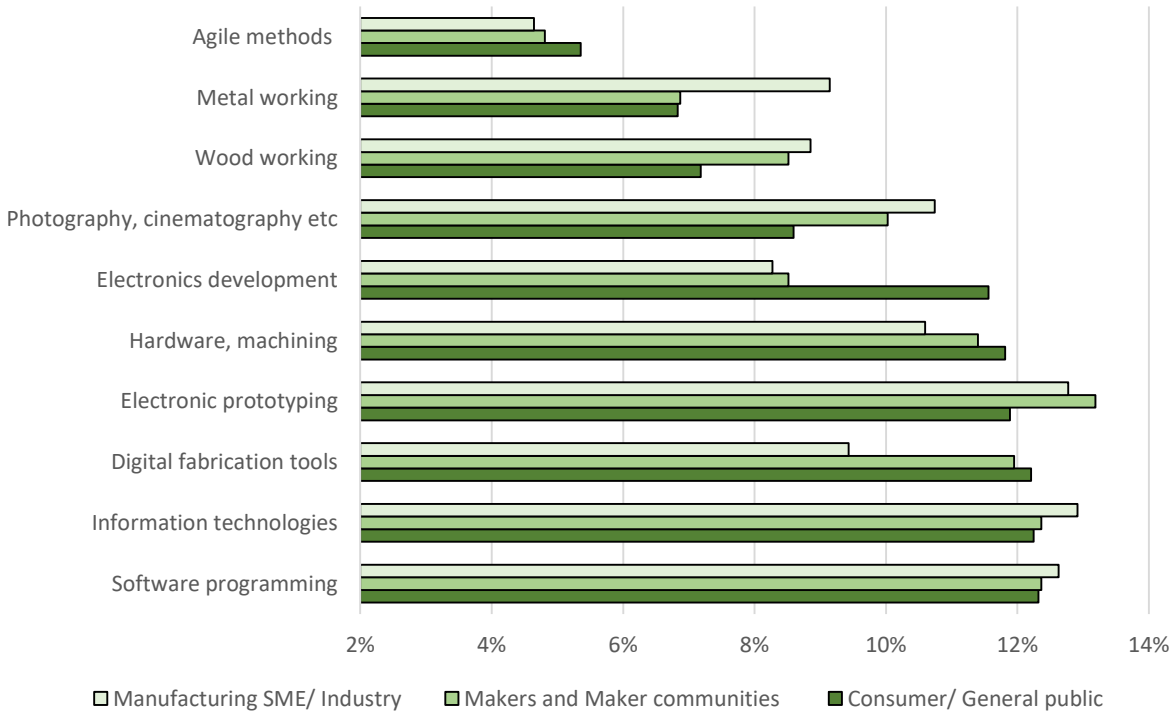


Figure 16. Prioritization of activities for which collaboration with partners is required.

4.2. Statistical Analysis

This section includes the statistical analysis of the 2nd round survey-collected data with an EU-level coverage. It presents findings towards estimating the effects of selected parameters on the stakeholders' and general public's perceptions and willingness to participate in makerspaces and Fablabs. Our analysis includes four discrete sections with a specific focus on identifying (i) general factors; (ii) barriers; (iii) drivers; and (iv) digital elements affecting survey participants' perceptions across Europe. In terms of methodology, we used Ordinary Least Squares (OLS) as our main statistical method for estimating the effects of these factors on general perceptions and willingness to join makerspaces and Fablabs. In addition, we have built upon a series of findings derived from the factor analysis performed in D2.1.

4.2.1. Statistical significance of examined factors

In the first case, we aimed at estimating the impact of general factors, such as demographic characteristics, familiarity, awareness, participants overall perception and willingness to join a makerspace or a Fablab. The results of the analysis for the 8 models that we run for the overall sample and specific sub-samples are presented in *Table 11 (2 two dependent variables * 4 groups: total sample; consumers; makers and manufacturers)*.

We can see that familiarity with terms related to makerspaces and Fablabs, has been found statistically significant in the case of the survey's total sample, the consumers, and the makers, when referring to both makerspace perceptions and willingness to join a makerspace or a Fablab. Familiarity seems to not affect these dependent variables in the case of manufacturers. Our results indicate that a reference of previous experience – having been involved in makerspaces and collaborative production – is statistically significant only regarding a person's willingness to join, when we consider our total sample and consumers. That means that **higher levels of previous experience result in an increased willingness to join makerspaces and Fablabs**. The same behaviour also applies in the case of the unfulfilled needs variables. This means that **consumers who believe that there is a lack of products out in the market, well-aligned to their needs, are more open to approaches such as makerspaces and Fablabs to achieve higher levels of variety**.

Perceptions related to potential positive roles of makerspaces and Fablabs, including them serving as means for promoting inclusion (Q13_1), increasing local contribution (13_2), scaling-up of production (Q13_3) and training centres (Q13_4), have also been investigated in this first stage of the analysis. Results in *Table 11* indicate that **promoting functionalities/roles of makerspaces related to inclusion and the training character of makerspaces could be an effective way to increase positive perceptions in the case of consumers, makers and manufacturers**. Scaling up production and local contributions seem also to be significant factors for increasing perceptions and willingness to join when we refer to consumers specifically. **Consumer empowerment and higher quality services are two factors that seem to be statistically significant in almost all cases**. **Enhancing innovation is significant only for consumers**, whereas **makers losing their identity** is a negative perspective embraced by this group too.

Finally, when it comes to demographic characteristics, we can see that **age is a significant factor affecting perceptions and willingness to join only consumers** (*models 1* and *3*), with gender being significant in only one case (*model 8*). It is interesting to notice that **older consumers are more positive towards makerspaces** and more willing to join them (*model 3*), and at the same time, **makers with higher education have a similar attitude** (*model 6*). Being a woman negatively affects willingness to join makerspaces in the case of manufacturers (*model 8*). **Having a background in the fields of engineering or computer and information science is another significant factor related to increased perceptions and willingness to join makerspaces and Fablabs for consumers and makers. Lower income is found to be related to higher levels of willingness to join in the case of manufacturers** (*model 8*), whereas population density is statistically significant in very few cases (*models 6* and *8*).

Table 11. OLS results for consumers, makers, and manufacturing SMEs – focus on general factors

Independent Variables	Total sample		Consumers		Makers		Manufacturers	
	Perception	Willingness to join.	Perception	Willingness to join.	Perception	Willingness to join.	Perception	Willingness to join.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Familiarity with terms	0.038 ***	0.036 ***	0.037 ***	0.035 ***	0.040 ***	0.023	0.024	0.006
Previous experience	0.016	0.094 **	0.060	0.182 ***	0.165	0.052	-0.053	0.061
Unfulfilled needs	-0.008	0.076 ***	-0.003	0.087 ***	-0.014	-0.021	-0.014	0.050
Promote inclusion	0.100 ***	0.045 **	0.075 ***	0.020	0.067	0.057	0.145 ***	0.024
Contribute locally	0.112 ***	0.047 **	0.069 ***	-0.014	0.116 *	0.063	0.088	0.067
Scale-up production	0.037 **	0.116 ***	0.031	0.113 ***	0.014	-0.068	0.037	0.071
Act as training centres	0.107 ***	0.076 ***	0.093 ***	0.056 ***	0.126 *	0.079	0.076	0.097 **
Empower consumers	0.132 ***	0.113 ***	0.085 ***	0.066 ***	0.111 *	0.092	0.131 ***	0.127 ***
Makers lose their identity	-0.048 ***	-0.046 ***	-0.037 **	-0.042 **	-0.053	-0.032	0.025	-0.029
Enhance innovation	0.076 ***	0.023	0.082 ***	0.009	0.001	0.057	-0.035	-0.079
Higher quality services	0.065 ***	0.131 ***	0.024	0.072 ***	0.069	0.126 ***	0.171 ***	0.133 ***
Barriers_F1	-0.039 *	-0.021	-0.044 **	-0.036	-0.106	-0.170 **	-0.006	0.136 *
Barriers_F2	-0.036 **	0.006	-0.040 **	0.010	0.004	0.041	0.013	-0.021
Barriers_F3	-0.049 **	-0.025	-0.040 *	-0.040	0.013	0.067	-0.081	0.019
Barriers_F4	0.170 ***	0.270 ***	0.118 ***	0.224 ***	0.076	0.192 **	0.109	0.086
Drivers_F1			0.258 ***	0.150 ***	0.336 ***	0.376 ***		
Drivers_F2			-0.038	0.189 ***	-0.056	0.065		
Drivers for SMEs and industry							0.283 **	0.379 ***
Gender	0.016	0.033	0.028	0.056	-0.061	0.052	0.019	-0.175 **
Age	0.039 ***	-0.019	0.036 ***	-0.021	0.054	-0.019	0.050	-0.002
Education	0.015	0.028	0.017	0.028	0.013	0.094 **	-0.005	0.068
Background	0.075 ***	0.159 ***	0.058 **	0.183 ***	-0.062	0.006	0.250 ***	-0.060
Income	-0.021	-0.039	-0.016	-0.021	-0.071	-0.045	-0.095	-0.207 ***
Area	0.027	0.025	0.015	0.040	-0.038	-0.136 *	0.139 *	-0.011
Constant	0.675 ***	0.011	0.574 ***	-0.298 *	0.487	-0.168	-0.288	-0.064
Observations	2,753	2,753	2,266	2,266	229	229	258	258
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.4051	0.3315	0.3986	0.3380	0.5730	0.6237	0.5795	0.5301

Level of statistical significance: ***p<0.01, **p<0.05, *p<0.1

Source: Authors' calculations

4.2.2. Barriers and concerns around involvement in makerspaces

Moving on to a more detailed analysis of the factors that might act as barriers, *Table 12* presents the main findings for the three different stakeholder groups. In this case, we chose to decompose the factors referring to barriers as they have been identified through our factor analysis presented in detail in D2.1, in order to get a more thorough insight.

First, we start with **barriers related to security, operational aspects, and potential motives around makerspaces** (Barriers_F1). Concerns about sharing sensitive information seems to be a significant barrier, in the case of makers, negatively affecting the overall perception and willingness to join makerspaces and Fablabs (*models 13* and *14*). On the contrary, operational and management problems constitute a barrier for the case of overall consumers' perceptions (*model 11*). Finally, aspects related to different philosophy and motives that might arise between each individual and the makerspaces have been found to be statistically significant only in the case of makers' willingness to join these initiatives.

Second, we further explored the role of the **health and environmental sustainability related barriers** (Barriers_F2). Lack of health and safety regulations and clarity about responsibility in case of an accident is a statistically significant barrier in the case of consumers' perceptions (*models 9* and *11*). Lack of basic sustainability principles regarding the environment has not been found to be a significant barrier for any of the identified groups of participants.

Third, **barriers referring to lack of inclusion, skills, and technologies** (Barriers_F3) are the next groups that is further examined in our analysis. Starting from participants' perception "belonging to a sociodemographic group that is underrepresented in makerspaces"*, Table 12* shows that this factor has a diversified impact of the two dependent variables (perceptions and willingness to join). In the case of the overall perceptions, our results suggest that this feeling of exclusion has a negative effect - acts as a barrier - and is statistically significant when considering our total sample (*model 9*). However, the feeling of being member of a sociodemographic group that is underrepresented in makerspaces seems to increase the willingness to join a makerspace or a Fablab in the case of makers and consumers (*models 10*, *12* and *14*). At the same time, lack of the necessary skills to be involved in making activities acts as a barrier for consumers in joining a makerspace (*models 10* and *12*). Lack of suitable technologies is partially significant in relation to participants' willingness to join only when considering the whole sample (*model 10*).

Forth, **barriers related to the lack of makerspaces, available information, and funding opportunities** (Barrier_F4) is the final group further explored. Not having enough makers, makerspaces or Fablabs is a concern that significantly affects general public and makers' perceptions as well as their respective willingness to join them (*models 9-12* and *14*). Moreover, increased lack of information about makerspaces and their activities seems to be a significant barrier mostly for consumers that have an increased overall perception and willingness to join these initiatives (*models 11* and *12*). Finally, funding opportunities appears to be a significant barrier in the cases of consumers and manufacturers who indicated positive perceptions around and willingness to join makerspaces and Fablabs (*models 9, 10, 12* and *15*).

Table 12. OLS results for consumers, makers, and manufacturing SMEs – focus on barriers

Independent Variables	Total sample		Consumers		Makers		Manufacturers	
	Perception (9)	Willingness to join (10)	Perception (11)	Willingness to join (12)	Perception (13)	Willingness to join (14)	Perception (15)	Willingness to join (16)
Familiarity with terms	0.037 ***	0.033 ***	0.036 ***	0.031 ***	0.038 ***	0.021	0.022	0.006
Previous experience	0.020	0.077 *	0.058	0.164 **	0.208 *	0.050	-0.083	0.077
Unfulfilled needs	-0.008	0.070 ***	-0.004	0.081 ***	-0.039	-0.030	-0.022	0.049
Promote inclusion	0.100 ***	0.041 **	0.074 ***	0.014	0.070	0.064	0.150 ***	0.016
Contribute locally	0.113 ***	0.047 **	0.070 ***	-0.014	0.123 **	0.063	0.095 *	0.088 *
Scale-up production	0.037 **	0.110 ***	0.030	0.103 ***	0.030	-0.068	0.050	0.064
Act as training centres	0.107 ***	0.079 ***	0.093 ***	0.058 **	0.120	0.064	0.052	0.088 *
Empower consumers	0.130 ***	0.121 ***	0.083 ***	0.074 ***	0.099 *	0.080	0.133 ***	0.130 ***
Makers lose their identity	-0.049 ***	-0.044 **	-0.038 **	-0.037 *	-0.026	-0.016	0.048	-0.035
Enhance innovation	0.077 ***	0.025	0.083 ***	0.007	-0.006	0.064	-0.031	-0.064
Higher quality services	0.064 ***	0.128 ***	0.024	0.067 **	0.062	0.117 **	0.158 ***	0.134 ***
Not enough makers/makerspaces/Fablabs	0.064 ***	0.114 ***	0.056 ***	0.104 ***	0.056	0.110 **	-0.033	0.043
Sociodemographic group that is underrepresented in makerspaces.	-0.025 **	0.049 ***	-0.006	0.061 ***	-0.010	0.084 **	-0.068	-0.067
Lack of information	0.053 ***	0.058 ***	0.036 **	0.041 *	0.028	0.043	0.061	0.006
Lack of the necessary skills	-0.012	-0.095 ***	-0.010	-0.111 ***	-0.050	-0.015	0.028	0.053
Lack of suitable technologies	-0.012	0.033 *	-0.024	0.021	0.072	0.010	-0.075	0.023
Concerns about sharing sensitive information	-0.003	0.004	-0.005	-0.007	-0.088 *	-0.082 **	0.084 **	0.091 **
Operational and management problems	-0.032 **	0.000	-0.035 **	0.002	-0.005	0.009	-0.021	0.044
Different philosophy &motives	-0.005	-0.026	-0.002	-0.027	0.008	-0.079 *	-0.067	0.000
Funding opportunities.	0.053 ***	0.088 ***	0.027	0.060 ***	-0.012	0.041	0.150 ***	0.080
Lack of health and safety regulations	-0.028 **	-0.009	-0.028 *	-0.007	-0.037	0.002	0.032	0.025
Lack of sustainability principles	-0.007	0.008	-0.010	0.010	0.035	0.038	-0.050	-0.062
Drivers_F1			0.261 ***	0.178 ***	0.333 ***	0.379 ***		
Drivers_F2			-0.037	0.177 ***	-0.064	0.051		
Drivers for SMEs and industry							0.293 ***	0.350 ***
Gender	0.017	0.029	0.027	0.050	-0.060	0.033	0.035	-0.162 *
Age	0.040 ***	-0.024 *	0.036 ***	-0.026 *	0.049	-0.032	0.056	0.007
Education	0.016	0.023	0.017	0.020	-0.002	0.099 **	0.009	0.077
Background	0.076 ***	0.143 ***	0.057 *	0.162 ***	-0.089	-0.008	0.259 ***	-0.062
Income	-0.021	-0.030	-0.016	-0.010	-0.051	-0.055	-0.125	-0.212 ***
Area	0.025	0.027	0.013	0.041	-0.040	-0.134 *	0.153 *	-0.025
Constant	0.667 ***	0.138	0.575 ***	-0.146	0.567 *	-0.075	-0.367	-0.116
Observations	2,753	2,753	2,266	2,266	229	229	258	258
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.4059	0.3449	0.4000	0.3559	0.5875	0.6372	0.6087	0.5470

Level of statistical significance: ***p<0.01, **p<0.05, *p<0.1

Source: Authors' calculations

4.2.3. Drivers for participation in social manufacturing

The drivers related to consumers (Q18), as identified in our survey, have a significant effect on the formation of our dependent variables. *Table 13* and *Table 14* present a detailed analysis of the effect of each driver on the overall perceptions and willingness to join makerspaces and Fablabs. We first decompose drivers referring to aspects related to consumers and makers' behaviour (*Table 13*), whereas in the next step we decompose drivers related to manufacturers and SMEs (*Table 14*).

4.2.3.1. Participation drivers according to consumers and makers

Following the results of our factor analysis we can group drivers in aspects related to **personal improvement and community networking aspects** (Drivers_F1) and aspects related to **product and market-oriented aspects** (Drivers_F2).

In the first case, accessing tools or mentorship seems to be a significant factor for consumers, positively affecting their perceptions and willingness to join makerspaces and Fablabs (*models 17* and *18*). Moreover, acquiring new technical skills is essential for them for improving their overall perceptions (*model 17*), whilst providing a valuable service to their community is a significant factor for empowering willingness to participate in these initiatives (*model 18*). At the same time, sharing knowledge and skills with others and meeting individuals with common interests are two significant factors for increasing the interest of makers in taking part in social manufacturing (*models 19* and *20*).

In the case of product and market-oriented aspects (Drivers_F2), gaining financial rewards is a significant driver for both consumers and makers (*models 17, 18* and *19*), whereas gaining peer-recognition/acknowledgement as inventors is only significant for improving makers' perceptions for makerspaces and Fablabs (*model 19*). Achieving moral satisfaction from seeing their idea turned into product acts as a driver solely for consumers (*models 17* and *18*). Finally, extending their network or improving their employability skills has not been found to be a significant factor for any of the above-mentioned groups.

4.2.3.2. Participation drivers according to manufacturers and SMEs

Statistical analysis' findings on the identified drivers related to manufacturers are presented in *Table 14*. Results indicate that the only statistically significant factor here is reducing the cost of developing products and services that can in turn boost manufacturers' overall perception about makerspaces and Fablabs.

Table 13. OLS results for consumers and makers – focus on drivers

Independent Variables	Consumers		Makers	
	Perception (17)	Willingness to join (18)	Perception (19)	Willingness to join (20)
Familiarity with terms	0.036 ***	0.035 ***	0.043 ***	0.027 *
Previous experience	0.058	0.168 **	0.090	0.016
Unfulfilled needs	-0.003	0.084 ***	-0.011	-0.032
Promote inclusion	0.075 ***	0.022	0.055	0.076
Contribute locally	0.067 ***	-0.013	0.137 **	0.075
Scale-up production	0.037 *	0.111 ***	0.054	-0.049
Act as training centres	0.090 ***	0.055 **	0.131 **	0.079
Empower consumers	0.083 ***	0.062 **	0.094 *	0.079
Makers lose their identity	-0.036 **	-0.040 **	-0.041	-0.012
Enhance innovation	0.080 ***	0.013	0.030	0.057
Higher quality services	0.026	0.069 **	0.045	0.116 **
Barriers_F1	-0.046 **	-0.038	-0.158 **	-0.206 **
Barriers_F2	-0.035 *	0.008	0.028	0.052
Barriers_F3	-0.037	-0.039	0.048	0.096
Barriers_F4	0.106 ***	0.219 ***	0.048	0.176 **
Access tools or mentorship	0.084 ***	0.064 **	-0.012	0.022
Acquire new technical skills	0.050 **	0.020	0.103	0.031
Provide a valuable service to their community	0.003	0.085 ***	-0.098	-0.040
Share knowledge and skills with others	0.034	-0.043	0.190 ***	0.095 *
Improve their employability skills	0.004	0.027	0.025	0.052
Extend their network	0.017	0.028	-0.056	0.062
Meet individuals with common interests	0.037 *	0.005	0.109 *	0.172 ***
Gain financial rewards	-0.045 ***	0.051 **	-0.121 **	-0.038
Gain peer-recognition/acknowledgement as inventors	0.004	0.023	0.106 **	0.078
Achieve moral satisfaction from seeing their idea turn into product	0.036 *	0.089 ***	-0.002	-0.004
Gender	0.032	0.056	-0.047	0.056
Age	0.034 ***	-0.023	0.057	-0.016
Education	0.016	0.028	0.028	0.086 **
Background	0.056 *	0.183 ***	-0.056	0.024
Income	-0.019	-0.025	-0.073	-0.048
Area	0.013	0.040	-0.033	-0.133
Constant	0.602 ***	-0.266 *	0.407	-0.261
Observations	2,266	2,266	229	229
Prob > chi2	0.000	0.000	0.000	0.000
R-squared	0.4038	0.3419	0.6215	0.6433

Level of statistical significance: ***p<0.01, **p<0.05, *p<0.1

Source: Authors' calculations

Table 14. OLS results for manufacturing SMEs – focus on drivers

Independent Variables	Manufacturers	
	Perception (7)	Willingness to join (8)
Familiarity with terms	0.023	0.007
Previous experience	-0.021	0.056
Unfulfilled needs	-0.023	0.050
Promote inclusion	0.131 **	0.026
Contribute locally	0.100 *	0.064
Scale-up production	0.051	0.069
Act as training centres	0.086 *	0.104 **
Empower consumers	0.112 **	0.128 **
Makers lose their identity	0.026	-0.026
Enhance innovation	-0.029	-0.082
Higher quality services	0.164 ***	0.137 ***
Barriers_F1	-0.025	0.140
Barriers_F2	0.025	-0.021
Barriers_F3	-0.100	0.017
Barriers_F4	0.129 *	0.095
Reduce costs	0.136 ***	0.028
Develop personalised products	0.076	0.019
Enhance co-creation	-0.066	0.039
Identify new commercial opportunities	0.076	0.070
Share vision	0.016	0.045
Test new product designs	-0.009	0.061
Increase efficiency	0.017	0.032
Optimize resources	0.052	0.061
Become more self-aware on sustainability issues	-0.008	0.013
Gender	0.051	-0.183 **
Age	0.040	-0.004
Education	-0.002	0.066
Background	0.234 ***	-0.060
Income	-0.085	-0.202 **
Area	0.136	-0.013
Constant	-0.254	-0.092
Observations	258	258
Prob > chi2	0.000	0.000
R-squared	0.5967	0.5329

Level of statistical significance: ***p<0.01, **p<0.05, *p<0.1

Source: Authors' calculations

4.2.4. Significance of different digital tools per stakeholder group

As a final step of our analysis, we provide some targeted insights with regards to the types of digital features (tools) that have the greatest potential of being used for social manufacturing. Given the importance of selecting the most appropriate tools for increasing the effectiveness of an online platform, we have dedicated a part of our analysis to explore insights referring to specific tools' effectiveness as means for boosting stakeholders' perception and willingness to join these initiatives.

The main findings are presented in *Table 15*. For this analysis we have used data referring to the alignment of perceptions related to accessing a series of digital features in web platform for social manufacturing (Q20). Taking a closer look at *Table 15*, we can see that there is a variation between the different types of stakeholders regarding the tools that they consider to be useful in makerspaces or Fablabs.

Starting from ***manufacturers***, our results have pointed out that digital tools are significant only in terms of improving their willingness to participate in these initiatives. More specifically, we have highlighted the importance of three different types of digital tools:

(i) easy-to-use digital tools, such as design thinking tools, generative design platform, Augmented Reality (AR)/ Virtual Reality (VR) modelling,
(ii) mapping tools providing list of makerspaces/Fablabs' manufacturing equipment,
(iii) collaboration tools, such as tools enabling remote collaboration.

In the case of ***makers***, the list of the identified tools as significant includes:

(i) tools for technical lectures and mentoring from qualified experts,
(ii) tools for training activities, focusing on enhancing the skills of DIY on how to use Fablabs' tools and machinery,
(iii) tools for enhancing the contact points for experts, such as experts' pool with profiles so that other makers/SMEs can seek assistance.

When it comes to ***consumers*** the list of digital tools that have been seen to be significant includes:

(i) easy-to-use digital tools, such as design thinking tools, generative design platform, Augmented Reality (AR)/ Virtual Reality (VR) modelling,
(ii) mapping tools providing list of makerspaces/Fablabs' manufacturing equipment,
(iii) tools for technical lectures and mentoring from qualified experts,
(iv) tools for training activities focusing on enhancing the skills of DIY on how to use Fablabs' tools and machinery,
(v) social network tools, like discussion Fora,
(vi) communication and matchmaking services between SMEs and makers based on skills, experience and needs.

When exploring our 2nd round survey sample, we can see that the tools that are commonly significant across *all stakeholder groups* for boosting overall perception in relation to makerspaces and Fablabs, include mapping tools (list of makerspaces/Fablabs' manufacturing equipment) and collaboration tools. Finally, inspection and metrology tools for quality control have not been found to be statistically significant in any of the abovementioned cases

Table 15: OLS results for consumers, makers and manufacturing SMEs – focus on digital features

Independent Variables	Total sample		Consumers		Makers		Manufacturers	
	Perception	Willingness to join	Perception	Willingness to join	Perception	Willingness to join	Perception	Willingness to join
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Familiarity with terms	0.036 ***	0.032 ***	0.035 ***	0.032 ***	0,041 ***	0,016 *	0,021	0,001
Previous experience	0.022	0.119 ***	0.055	0.186 ***	0,121	0,056	-0,054	0,020
Unfulfilled needs	-0.007	0.078 ***	-0.004	0.085 ***	-0,041	-0,032	-0,031	0,036
Promote inclusion	0.083 ***	-0.002	0.070 ***	-0.011	0,063	0,027	0,147 ***	0,029
Contribute locally	0.093 ***	-0.004	0.067 ***	-0.020	0,106 *	0,043	0,062	0,003
Scale-up production	0.026	0.080 ***	0.025	0.089 ***	0,007	-0,071	0,033	0,070
Act as training centres	0.089 ***	0.031 *	0.085 ***	0.031	0,134 *	0,036	0,066	0,046
Empower consumers	0.107 ***	0.044 **	0.081 ***	0.039	0,119 **	0,035	0,136 ***	0,127 ***
Makers lose their identity	-0.040 ***	-0.022	-0.037 **	-0.028	-0,050	-0,034	0,031	-0,008
Enhance innovation	0.056 ***	-0.027	0.074 ***	-0.019	-0,004	0,025	-0,047	-0,109 **
Higher quality services	0.042 **	0.070 ***	0.021	0.051 **	0,060	0,104 **	0,153 ***	0,091 **
Barriers_F1	-0.056 ***	-0.068 ***	-0.054 **	-0.076 ***	-0,063	-0,090	-0,027	0,069
Barriers_F2	-0.034 **	0.010	-0.041 **	0.012	0,008	0,038	0,016	-0,013
Barriers_F3	-0.044 **	-0.013	-0.035	-0.027	-0,009	0,044	-0,104	0,000
Barriers_F4	0.127 ***	0.158 ***	0.103 ***	0.169 ***	0,080	0,100	0,120 *	0,060
Drivers_F1			0.215 ***	-0.044	0,261 **	0,162		
Drivers_F2			-0.059 *	0.108 ***	0,009	0,099		
Drivers for SMEs and industry							0,213	0,214 **
Easy-to-use digital tools	0.022	0.054 ***	-0.005	0.045 *	0,006	0,089	0,070	0,089 **
List of makerspaces/Fablabs' manufacturing equipment	0.068 ***	0.146 ***	0.064 ***	0.155 ***	-0,004	0,078	0,001	0,113 **
Tools for quality control	0.012	0.018	0.018	0.007	-0,075	-0,044	-0,021	0,067
Technical lectures and mentoring	0.006	0.052 **	0.010	0.056 **	-0,069	0,083 *	-0,030	-0,060
Training activities	0.027	0.076 ***	-0.010	0.079 ***	0,212 ***	0,093 *	-0,031	0,070
Social network tools	0.005	0.045 **	0.010	0.047 **	-0,084 *	-0,035	0,045	0,030
Matchmaking services	0.020	0.099 ***	0.013	0.106 ***	-0,024	0,056	0,044	0,004
Contact points for experts	0.021	0.050 **	0.010	0.036	0,091	0,157 ***	0,037	0,022
Collaboration tools	0.031 *	0.039 *	0.024	0.026	-0,034	0,018	0,054	0,106 **
Gender	0.010	0.013	0.027	0.038	-0,039	0,057	0,023	-0,162 **
Age	0.035 ***	-0.025 *	0.033 ***	-0.026 *	0,048	-0,013	0,041	-0,040
Education	0.013	0.021	0.015	0.023	-0,015	0,027	0,004	0,097 **
Background	0.065 **	0.134 ***	0.053 *	0.165 ***	-0,067	-0,022	0,240 ***	-0,089
Income	-0.025	-0.049 *	-0.019	-0.036	-0,043	-0,033	-0,078	-0,213 ***
Area	0.022	0.010	0.011	0.029	-0,063	-0,131 *	0,113	-0,064
Constant	0.569 ***	-0.306 **	0.573 ***	-0.385 ***	0,552 *	-0,109	-0,251	0,095
Observations	2,753	2,753	2,266	2,266	229	229	258	258
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.4232	0.4238	0.4064	0.4037	0.6177	0.7240	0.5939	0.5941

Level of statistical significance: ***p<0.01, **p<0.05, *p<0.1

Source: Authors' calculations

5. Insights on Potential Platform Features

While the scope and core objective of T2.1 is to identify and analyse project stakeholders' perceptions, intentions, needs, drivers and barriers with regards to their involvement and active engagement in user innovation and social manufacturing, this section aims at providing **indications with regard to the development and design of the iPRODUCE platform for social manufacturing, highlighting potentially desirable features.**

Our latest investigations indicated that **findings deriving from the wider, EU level, survey appear to be aligned with the pilot level survey-identified recommendations on potential platform features**. Still, the crowdsourcing data collection process, employed this time, facilitated a better randomisation of the captured sample, compared to the 1st round responses which were mostly collected through the cMDFs' communication channels. **The updated recommendations, presented below, follow the same structure as initially introduced under D2.1. They are, however, enriched, based on a more unbiased perspective of the stakeholders' behavioural aspects, and, therefore, complement the preliminary pointers derived from the pilot-level assessment.**

Indications, enlisted herein, serve as theoretical suggestions and not as technical feedback on the type of user experience that potential platform visitors would wish to have. The following recommendations can be relevant to the project's technical work tasks, offering a motivation for some components to be designed and refined. However, it must be underlined that the definition of the platform's functional requirements is specifically addressed within iPRODUCE T2.5, whereas the software engineering methodology employed for the platform development is being thoroughly presented in T4.1.

Recommendation 1: Clearly communicate the culture of cMDFs

On the one hand, the majority of people believe that makerspaces can make a big difference. On the other hand, respondents reported a lack of information with regard to the exact makerspaces' scope and actions. In this context, the **ways in which makerspaces and Fablabs contribute locally, empower consumers and promote inclusion are key elements that need to be stressed towards effectively boosting positive perceptions and willingness to join these initiatives**. The analysis suggests that a higher visibility on the existence, vision and activities of makerspaces is needed to achieve this. In this framework, online platforms should focus on effectively enabling visitors not only to get **acquainted and familiarised** with the concept of social manufacturing and the cMDFs, but to also be able to directly **engage in digital co-creation and co-production processes**. Our findings suggest that easy-to-use digital tools together with collaboration tools should be among the most important features to be found in a digital platform. Moreover, based on the survey-respondents' identified needs, an online mapping exercise of **makerspaces' and Fablabs' locations and their respective manufacturing equipment** would definitely serve as added value, especially for makers and consumers.

This recommendation is relevant with the **iPRODUCE Marketplace,** the **Generative Design Platform and the AR/VR toolkit.** The Marketplace should conceptually serve as a window to the public, providing a one-stop-shop for the cMDFs to include their users in a modern and digital co-manufacturing process, in which they will also be able to promote their products. In this context, it is important for makerspaces and Fablabs to be able to register their location and manufacturing equipment in the iPRODUCE platform. In parallel, **digital co-creation and co-production processes** are expected to be supported by the **Generative Design Platform and the AR/VR toolkit.** Ease of use should be a key pillar for the development of both.

Recommendation 2: Encourage direct knowledge sharing: virtual training and skills exchange

A great majority of the survey population sample has further expressed strong willingness to exchange knowledge and gain access to dedicated trainings and mentoring. It is evident that a **training support tool for social manufacturing** would be a vital asset of such a digital platform, especially for makers

and consumers. Platform users would expect, among else, to increase their **knowledge and skills on how to use, for example, the nearest-to-them cMDF's machinery and equipment**. Interactive virtual sessions offering either technical (designing, making, crafting, CAD etc.) or soft (creativity techniques) skills training would help engaging a wider audience. Training could be targeted either to support a specific business venture, a creative project already underway, or for the primary purpose of gaining competencies for later use. In support of direct knowledge sharing and mentorship, peer to peer online learning could be an additional option to be virtually encouraged. The provision of such an element would allow **existing technicians and experts to occasionally serve as mentors and advisors rather than teachers in platform-developed projects**.

This recommendation is related with the development of the **iPRODUCE Digital Fablab Kit (Training Support Tool, Process Automation Tool)**. Among the aims of such tools should be the digitalization of workshop results, tutorials and methods, user manuals and hands-on best practices for machinery, and material, knowledge-, material-, and machinery-exchange. In this context, multimedia integration should also be considered for the development of these tools, including audio, video, text, image, 3D animation, etc.

Recommendation 3: Support matchmaking and professional networking

Participation in makerspaces opens up new horizons, enabling makers to reach out to a wider network which could also yield more professional opportunities. Or at least this is what the majority of the survey respondents expect. Our survey-captured insights confirm the will of makers and consumers to be empowered, not only to depict their **ideas for new products** but to also be able to **find expertise and manufacturing capabilities** to implement them. In this context, **matchmaking services** are, considered essential and are indeed in line with the expressed aspirations to grow a person's professional network.

At the same time, the analysis of existing roles and collaborations can set the ground for new synergies to be established and new funding opportunities to be identified. There are several aspects (e.g., location, industry sector, language, material, machine knowledge, technology, design tools, etc.) that could serve as matchmaking criteria for building a professional network or developing a project. **Our analysis pointed out that skills, activity and location are some of the most significant aspects to be considered in the case of developing matchmaking events for makers and consumers**, whereas type of product and technologies should lie in the core of matchmaking events targeting manufacturing SMEs and industry stakeholders. In the latter case, services provision and certification also plays a key role. Therefore, the platform should allow users **look for profiles with specific capabilities and skills** based on these criteria, **providing targeted recommendations** that assist the creation of agile networks. In this way, **users will be able to jointly respond to new or existing business opportunities based on matching capabilities**. Such a feature could also be particularly useful for users aiming to initiate new collaborations or to plan joint undertakings between different parties with complementary profiles.

From a conceptual perspective, the users should be able to create a profile, providing several information (location, industry sector, language, material, skill, technology, etc.) through their registration in the iPRODUCE platform**.** This information could feed into the foreseen **iPRODUCE Matchmaking and Agile Network Creation Tool** which should operate in conjunction and will aim at fostering the creation of collaborative networks and empowering them to jointly address specific business opportunities. It should also be noted that, as confirmed by the survey outcomes, a large part of respondents believes that the management of intellectual property rights (IPR) should be addressed in such a digital platform. Therefore, the collaboration among users could be reinforced through the foreseen **Ricardian Toolkit**, to ratify their cooperation.

Recommendation 4: Promote community development and team building through online channels

Our findings indicate that the main drivers for participation in social manufacturing involve meeting people with common interests, exchanging knowledge and extending their network. In the context of a

digital platform, these drivers can be materialised giving users the **ability to create groups and communities that address their specific needs.** More specifically, through building online communities under a common interest (e.g., 3D printing, AR/VR, etc.), users will be able to directly exchange knowledge and find support on specific issues when needed. Communities, however, are not expected to be developed only around technical fields of knowledge, but also around other needs defined by the users. Therefore, **the ability to create online communities is expected to further boost participation and engagement in social manufacturing**. The outcomes of the EU-level survey revealed that using digital collaboration tools can act as facilitators towards managing activities in collaborative networks for the case of general public, whereas more targeted communication through email exchanges might increase the effectiveness of collaborative network development in the case of maker communities, SMEs and industry actors.

These recommendations can be relevant to both the **iPRODUCE Marketplace** and the **iPRODUCE Matchmaking and Agile Network creation tools** which can support the creation of teams and communities. It might be also linked with the iPRODUCE **mobile application,** which will help individuals and teams to obtain valuable feedback and solicit input about new or existing ideas.

Recommendation 5: Diversity, inclusiveness, accessibility and empowerment

Several survey respondents considered that further steps need to be taken so that makerspaces involve groups which are underrepresented (as also confirmed by current literature) in the maker movement, such as women, elderly, low socioeconomic status groups or people with disabilities. Our findings stress out **the importance of a respectful and supportive culture, the unwarranted genderisation of tasks/interests and the need for more female role models in the social manufacturing world**. While the maker movement has unique cultural elements, these are all cemented on the principles of diversity empowerment and unfettered access and should in turn be strongly reflected on a digital platform. This recommendation can be relevant for **all the components of the iPRODUCE platform**, underlining the need to have a holistic approach and work towards the development of an ecosystem that by-design prioritises diversity, inclusiveness, accessibility and empowerment.

Overall, there is a sheer need to develop an **inclusive digital space with an easy-to-use and user-welcoming interface**, based on appropriate design and language, **communicating equal expectations while accepting different approaches to making** regardless, for example, of gender or varying cultural and linguistic backgrounds. The iPRODUCE platform should further encourage approaches that **empower the inclusion of people with disabilities**. In this context, augmented reality can be viewed as an assistive technology, due to its potential to minimize the effects of a disability and provide an alternative means to accomplish a particular task. It is worth mentioning that digital fabrication has major inclusion and wellbeing benefits for disabled people. It can, among else, act as a route for finding work or support them in creating or modifying their own assistive technologies, which can, in turn, further assist them in playing a productive role in society. All, with no discrimination, platform-users, should be provided with the means to engage and virtually co-work with other people, encouraging the development of technical skills while building confidence at the same time.

6. Discussion and conclusions

Through crowdsourcing means, a large sample of responses was captured, this time at the EU level, better reflecting the needs, perceptions, drivers and barriers around social manufacturing. Collection of data from citizens, makers and manufacturers across Europe and the synthesis of the main quantitative results took place to compile some actionable conclusions on how to better engage with major types of project's stakeholders, existing and potential ones. **Documented results stemming from this 2nd round, EU-level, survey updated the early insights retrieved from the 1st round, pilot – level, survey analysis.** This section provides an overview of the main EU survey findings while, at the same time, presents comparative insights further considering preliminary discoveries of the pilot-level analysis.

This report's main **outcomes bear a strong potential to foster participation in and uptake of the project's activities and can especially serve as a valuable input for future workshops and discussion sessions** implemented, through the local iPRODUCE cMDFs, during the project's lifetime.

Familiarity and previous experience in a collaborative project

The diverse nature of the 2 surveys' samples (pilot and EU-level respectively), captured over 2 different rounds, is reflected in the varying levels of familiarity with the terms related to makerspaces and Fablabs. Respondents of the 1st round survey indicated a much higher level of familiarity with terms related to the maker movement, compared to what was found at the 2nd, EU-level, round. In the case of the EU analysis, "*makerspace*" and "*Fablab*" scored the lowest familiarity levels with a significant share of survey participants not being at all familiar with this terminology. This indicates an **increased need for better communicating these concepts amongst potential stakeholders** towards boosting participation in such initiatives.

Our analysis further investigated the relationship between educational level and previous experience around collaborative projects, concluding that **higher education (doctorate degree) constitutes, by far, the dominant force related to higher shares of previous experience**. This is a pattern shift compared to the pilot-level findings where primary education was the predominant educational background of respondents claiming previous experience with the maker movement. Overall results confirm that **higher levels of familiarity with terms related to social manufacturing, as well as previous experience in a collaborative project, constitute significant parameters positively affecting both perceptions and willingness to join the maker movement**.

Preferred types of activities and respondents' fields of expertise

Differences have been noted with regard to surveys-respondents' preferred types of activities though their potential participation in makerspaces. The EU-level survey analysis has revealed that: (i) **photography and cinematography** as well as **handcraft activities** are considered to be the most favoured activities for **consumers**; (ii) photography and cinematography followed by **digital fabrication tools** are popular for **makers**; whereas (iii) **woodworking, information technologies, software programming and hardware** were the most preferred activities in the case of **manufacturing SMEs and industrial actors**. Methods such as ideation, paper prototyping, design thinking as well as electronics' prototyping and metalworking constitute activities' options that had scored highly over the pilot-level survey. However, in this 2nd round EU level analysis, they are found at lower places in the preference list of all stakeholder groups.

Differences have also been observed with regard to respondents' main field of expertise. Participants in the 1st round survey were mostly related to electronics, mechanics and prototyping sectors, whilst in the 2nd round we **have participants mostly related to electronics, arts, accessories and clothing**. Hence, any variations between the two survey rounds' results might also be related to this varying expertise setting.

Perceptions and willingness to join a makerspace

The vast majority of the EU-level survey participants expresses a **positive attitude towards being involved in collaborative production**, firmly believing that such an experience bears a strong potential of opening up new professional opportunities. By joining a makerspace or Fablab, stakeholders mostly aim to participate in projects for **digital modelling and fabrication, gain access to digital tools and exchange ideas**. Our EU-level analysis further indicates that **consumer empowerment, provision of higher quality services and the promotion of functionalities related to inclusion and the training character of makerspaces** consist key factors that can **effectively increase all stakeholders' positive perceptions** around collaborative manufacturing projects. Findings further reveal that consumers who believe that there is a lack of products out in the market, well-aligned to their needs, are more open to approaches such as makerspaces and Fablabs to achieve higher levels of variety.

When it comes to the level of willingness to join a makerspace, **makers and consumers indicate an increased enthusiasm towards the benefits of makerspaces and Fablabs** and the positive impact that they may bring to local community. **Manufacturing SMEs**, on the other hand, **remain more reluctant** to get involved in such an experience. The distribution of the total sample responses remains similar between the 1st and 2nd round surveys and observed patterns remain aligned. The EU-level analysis, however, reflects more balanced reactions regarding makers' and industrial actors' beliefs, compared to what was captured over the pilot-level round. This might be caused due to their limited participation in the previous survey wave.

In terms of demographic characteristics, **age seems to be a significant factor affecting perceptions and willingness to join makerspaces** in both pilot and EU-level surveys. Level of education appears to be more positively associated to increased willingness to join such a concept in the case of the pilot-level survey. It is interesting to observe, however, that in both cases, **older consumers as well as makers with higher education** express a similar attitude, being **more positive towards their involvement in collaborative production**. In contrast to the pilot-level findings, the EU-level analysis further reveals that **having a background in the fields of engineering or computer and information science is also a factor positively associated to increased willingness to join makerspaces**.

It is worth noting that, in the case of manufacturers, lower income is related to increase willingness to join a makerspace. At the same time, in the cases of makers and consumers, the feeling of belonging to a sociodemographic group being underrepresented in the maker movement appears to be highly linked with an increased willingness to join a collaborative production initiative. Finally, with regard to gender, being a woman, in the case of consumers, negatively affects willingness to join makerspaces in the 1st round survey, whereas, in the EU-level analysis, **willingness to join makerspaces is negatively affected** solely **in the case of female manufacturers**. Spatial characteristics referring to the type of the area where participants reside (urban, semi-urban, rural) have not been found significant in any of the examined cases.

Survey participants further indicated the maturity stage of their potentially existing or upcoming product/service, during which they would be willing to join a makerspace. The EU-level analysis' findings, aligned with the pilot-level outcomes, indicated that approximately **1 out of 3 makers would be interested in joining a makerspace either at the design or ideation stage** of their product/service. At the same time. the majority of the **industrial actors'** population claimed that they **would join a makerspace over either the design or the fabrication stage** of a product/service, ultimately aiming to co-develop the final outcome.

Drivers and barriers for participation in social manufacturing

The EU-level analysis confirms that personal improvement aspects constitute the main drivers for boosting willingness to join makerspaces. **Acquiring new technical skills, achieving moral satisfaction from seeing an idea turned into product or even gaining financial rewards** are considered essential for the general public for improving their overall perceptions. At the same time**,**

providing a valuable service to their community is a significant factor for empowering their willingness to participate in such initiatives. **Exchanging knowledge and skills, community networking as well as earning money or peer-acknowledgement as inventors** constitute significant factors for increasing the interest of makers in taking part in social manufacturing. In parallel, **reducing the cost of developing products and services** constitutes the main driver that can boost manufacturers' perception about makerspaces and Fablabs.

With regard to barriers, our findings indicate that concerns related to the **lack of makerspaces, information, and funding opportunities**, affect all stakeholder groups' perceptions. In particular, the lack of funding opportunities appears to be a significant barrier mostly in the cases of consumers and manufacturers who indicated positive perceptions around makerspaces. The **lack of necessary skills** to be involved in making activities as well as **operational and management problems** act as important barriers mostly for consumers. Lack of health and safety regulations and clarity about responsibility in case of an accident are also perceived as major barriers by the same stakeholder group. That means **that lack of safety regulations might be a reason for general public not to join makerspaces**, and therefore, focusing on improving these conditions would be recommended towards increasing positive perceptions. Finally, concerns about **sharing sensitive information** as well as aspects related to **different motives** that might arise between individuals around makerspaces constitute crucial barriers only in the case of makers' willingness to join such an initiative.

Preferred digital features in a social manufacturing web platform

Pilot survey findings had indicated that people who are strongly in favour of introducing digital aspects as facilitators to the promotion of makerspaces also indicate increased positive perceptions around these initiatives, in spite being consumers, makers or manufacturers. The EU-wide survey provided an additional opportunity to get more in-depth insights, concluding that the **mapping and collaboration tools** are commonly significant across all stakeholder groups in positively affecting willingness to join the maker movement. Offering training activities to enhance skills on how to use Fablabs' machinery and providing easy-to-use digital tools, such as design thinking tools and AR/VR modelling, are also highly ranked in most stakeholders' preference list. Social network tools are considered essential for makers and consumers whereas manufacturers do not find them extremely crucial. Finally, inspection and metrology tools for quality control have not been found to be statistically significant in any of the abovementioned cases. With regard to IPR management, we can see a common pattern between makers and manufacturers both eagerly supporting copyright and patten options. Consumers, on the other hand, seem to be more positive towards smart contracts and less attracted to trademarks.

General remarks

Our latest and updated insights can help us to better understand the main facilitating or hindering factors around the uptake of social manufacturing. While the 1st round T2.1 survey revealed (D2.1) a series of findings at the pilots' national level, reflecting potentially existing specificities, the 2nd round survey comes to **complement and enhance the previously identified needs**, focusing now mostly on potential differences arising among the project's main stakeholder groups at the EU level.

The **2nd round insights capture a more unbiased perspective** regarding common beliefs in relation to the makers movement. This is due to the fact that data collection process was, this time, more open, providing better randomisation of the captured sample, compared to the 1st round survey, responses of which were mostly collected through the pilot partners' communication channels. The empirical nature of these insights provides some needed confidence to these results, but as is often the case with self-reported data and online data collection methods, there are some limitations to the transferability and generalisability of these findings.

The increased data availability this time enabled us to better decompose the needs between the three discrete stakeholders groups and identify potential variations amongst them. There are still lessons to learn, angles to explore, and diverse experiences and stories to be shared and studied. This, however, serves as more than just a humble start. **This is vital information upon which iPRODUCE can better target and fine-tune the project's foreseen actions** (i.e., establishment of cMDFs, designing

the iPRODUCE digital platform, etc.). **Analysis' outcomes can significantly contribute at detecting what needs to be communicated in order to build awareness and increase all stakeholders' interest** - equally considering (i) consumers/general public, (ii) makers and maker communities and (iii) manufacturing SMEs and industry actors - around social manufacturing.

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Annex I

Welcome note

Dear participant, welcome to our survey!

The survey lasts **about 10 minutes**. There are no right or wrong answers, this is about your views. All data is anonymised, and your privacy is guaranteed.

Thank you for helping us gather relevant information!

What is the iPRODUCE project?

iPRODUCE is an EU-funded Horizon 2020 project which aims to promote collaborative manufacturing between makers, consumers and manufacturing Small Medium Enterprises (SMEs).

The objectives of iPRODUCE are threefold:

(1) bring Manufacturers, Makers and Consumer communities (MMCs) closer at the local level;

(2) engage these communities into joint co-creation challenges for the manufacturing of new consumer products and the introduction of novel engineering and production (eco) systems;

(3) provide practices, methods, and tools that both makers and manufacturing companies (specifically SMEs) are employing.

With this survey we aim at collecting information regarding people's, makers' and manufacturers' perceptions, opinions and needs regarding the maker movement, collaborative manufacturing and co-creation schemes between individual makers, consumers, and manufacturing enterprises.

Introduction to the topic

Q1. To what extent are you familiar with the following terms? (1 - Not at all familiar; 2 – Not very familiar; 3 – Somewhat familiar; 4 – Very familiar)

	1	2	3	4
Q1_1. - DIY manufacturing Do it yourself" ("DIY") is the method of building, modifying, or repairing things without the direct aid of experts or professionals.				
Q1_2. - Makerspace The makerspace is a place in which people with shared interests can gather to work on projects while sharing ideas, equipment, and knowledge. These people are committed to creatively design and build material objects. For example, the construction of a table by designing and producing its components in 3D prototyping machine.				
Q1_3. - Fablab Fablabs are open high-tech workshops where individuals have the opportunity to develop and produce custom-made things which are not accessible by conventional industrial scale technologies.				
Q1_4. - Manufacturing Facility Technological infrastructure open to collaborations with manufacturing companies, especially SMEs, that provides rapid prototyping and technology transfer services to create prototypes and small series of products. It typically uses Additive Manufacturing (also metallic) as an enabling technology in synergy with more traditional production technologies. It is similar to a Fablab but with machines typical of industrial production.				
Q1_5. - Co-creation Co-creation is defined as any project/product/service emerging from a collaborative development with a group of different stakeholders (citizens, designers, companies, makers, etc.)				
Q1_6. - Social Manufacturing Social manufacturing is associated with the maker and DIY movement. It is characterized with high level of utilizing the power of communities to design and manufacture of goods.				

Q2. Do you like to work with your hands in your free time to (more than one option can be selected)**?**

- ☐ Fix things around the house, car, bike, etc.
- ☐ Work on your hobby (building models, furniture, gifts, toys/ clothes for kids, etc.)
- ☐ Play with electronics/ microcontrollers, 3d printers, other hardware
- ☐ Code (produce software)
- ☐ Design/ draw/ paint
- ☐ Other related activity that gets you personally engaged to work with your hands
- ☐ No, I do not like to work with my hands, I prefer to hire professionals

Q3_1. Do you consider yourself familiar with the concept of makerspaces and Fablabs?

[ ] Yes [ ] No

Q3_2. If yes, please specify the type of relationship you have (please select one option):

- ☐ I have heard of the makerspaces/Fablabs
- ☐ I have an acquaintance/friend/colleague who is a maker
- ☐ I have participated in a making activity
- ☐ I have used a makerspace/Fablab to develop a project
- ☐ Other

Q3_3. (Other) Please specify: (max. 200 characters)

Q4_1. What type of activities would you be interested in, in relation to makerspaces and Fablabs? (More than one option can be selected)**:**

- Digital fabrication tools (Laser Cutting, CNC Milling and 3D Printing)
- Hardware, machining, etc.
- Electronics prototyping
- Information technologies
- Software programming, etc.
- Photography, cinematography, photo editing etc.
- Woodworking, etc.
- Metalworking, etc.
- Handcraft (e.g., bags, jewellery, knitting, sewing)
- Agile methods (ideation, paper prototyping, design thinking, etc.)
- Other

Q4_2. (Other) Please specify: (max. 200 characters)

Q5_1. With which of the following online services do you consider yourself familiar? (more than one option can be selected):

- Social Media
- Specialized Fora
- Online Searching
- E-shopping
- Develop a project using platforms for 3D printing, electronics production (e.g. online resources like Shapeways, Ponoko, Upverter)
- Other

Q5_2. (Other) Please specify: (max. 200 characters)

Q6. Do you have previous experience with an activity involving makers and manufacturing SMEs in a collaborative project?

- [ ] Yes [ ] No

Q7. Please define your role/profession from the following list (please select one answer):

- Makers and Maker communities (e.g. Fablab)
- Manufacturing SME/ Industry
- Consumer/ General public

Q8_1. Which of the following sectors is more relevant to your field of expertise?

- Electronics
- Microelectronics/ nanoelectronics
- Furniture
- Prototyping
- Automotive
- Packaging
- Medicine/Health
- Mobility
- Mechanics
- Wearables

- Accessories
- Clothing, textiles
- Art
- Other

Q8_2. (Other) Please specify: (max. 200 characters)

Q9_1. In case you are a maker, at which stage is your current product/system/application that you would be interested to develop through a makerspace/Fablab?

- Idea stage
- Design stage
- Fabrication stage
- An existing product that needs added functionalities
- Other

Q9_2. (Other) Please specify: (max. 200 characters)

Q10_1. In case you are entrepreneurs / manufacturing SME, at which stage of your project you would be interested to develop through a makerspace/Fablab?

- Idea stage
- Design stage
- Fabrication stage
- An existing product that needs added functionalities
- Other

Q10_2. (Other) Please specify: (max. 200 characters)

Perceptions

Please indicate your agreement with the following statement [1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree]

	1	2	3	4	5
Q11. My overall perception about:					
Q11.1. - Makerspaces and Fablabs is positive.					
Q11.2. - the collaboration between makers, consumers and SMEs is positive.					
Q12. Participation in makerspaces and Fablabs:					
Q12.1. - does not provide any benefits.					
Q12.2. - is something that should be considered as a hobby.					
Q12.3. - opens up new professional opportunities.					
Q12.4. - will have a positive impact on my local area.					
Q13. Makerspaces should:					
Q13_1. - Involve groups which are underrepresented in the maker movement (e.g., women, elderly, people with disabilities, low Socioeconomic Status (SES) groups).					
Q13_2. - Contribute locally.					
Q13_3. - Scale up their production.					
Q13_4. - Function as training centres for disruptive technologies.					
Q14. I believe/feel that:					
Q14_1. - existing products in the market do often not fulfil my needs/preferences.					
Q15. Consumers:					
Q15_1. - should have an active role in the design of a product.					
Q15_2. are lacking the knowledge to be part of a manufacturing process.					
Q16. A social manufacturing ecosystem involving makers, consumers and manufacturers would:					
Q16_1. - empower consumers to be vocal about their needs and preferences					
Q16_2. - cause makers to lose their identity and purpose of making.					
Q16_3. - enhance manufacturers' innovation capacity.					
Q16_4. - Create circumstances for delivering higher quality services and products (higher competition in-between manufacturers).					

Barriers

Please indicate your agreement with the following statement (1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree)

	1	2	3	4	5
Q17. Regarding my participation in social manufacturing, I am concerned about the following aspects:					
Q17_1. - Not enough makers/makerspaces/Fablabs.					
Q17_2. - I belong to a sociodemographic group that is underrepresented in makerspaces.					

Q17_3. - Lack of information about makerspaces and their actions.					
Q17_4. - I lack the necessary skills to be involved in such activities.					
Q17_5. - Lack of suitable technologies (e.g., platforms, tools, etc.)					
Q17_6. - Concerns about sharing sensitive information (e.g., technical features of a product, invention/ idea, the design of a product).					
Q17_7. - Operational and management problems (e.g., standardization of procedures, potential logistics issues).					
Q17_8. - Different philosophy and motives (e.g., economic, social, cultural) among the involved parties (individual makers in contrast to SMEs).					
Q17_9. - Funding opportunities					
Q17_10. - Lack of health and safety regulations and clarity about responsibility in case of an accident.					
Q17_11. - Lack of basic sustainability principles regarding the environment					
Q17_12. - Other					
Q17_13. (Other) Please specify: (max. 200 characters)					

Drivers (To be answered only by makers/consumers)

Please indicate your agreement with the following statement (1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree)

	1	2	3	4	5
Q18. The participation of makers/consumers in social manufacturing would allow them:					
Q18_1. - To access tools or mentorship.					
Q18_2. - To acquire new technical skills.					
Q18_3. - To provide a valuable service to their community.					
Q18_4. - To share knowledge and skills with others.					
Q18_5. - To improve their employability skills.					
Q18_6. - To extend their network.					
Q18_7. - To meet individuals with common interests.					
Q18_8. - To gain financial rewards.					
Q18_9. - To gain peer-recognition/acknowledgement as inventors					
Q18_10. - To achieve moral satisfaction from seeing their idea turn into product.					
Q18_11. - Other					
Q18_12. (Other) Please specify: (max. 200 characters)					

Drivers (To be answered only by manufacturers)

Please indicate your agreement with the following statement (1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree)

	1	2	3	4	5
Q19. The participation of manufacturing SMEs in social manufacturing would allow them:					
Q19_1. - To reduce the cost of developing products and services.					
Q19_2. - To develop more personalised products					
Q19_3. - To enhance their co-creation culture.					
Q19_4. - To identify new commercial opportunities.					
Q19_5. - To share vision with customers.					
Q19_6. - To test new product designs and evaluate the product before reaching the market.					
Q19_7. - To increase efficiency (e.g., meet rapid demands changes)					
Q19_8. - To optimize resources					
Q19_9. - To become more self-aware on sustainability issues					
Q19_10. - Other					
Q19_11. (Other) Please specify: (max. 200 characters)					

Willingness to join

Please indicate your agreement with the following statement (1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree)

Q20. I would:	1	2	3	4	5
Q20_1. – like to be involved in a makerspace or Fablab.					
Q20_2. - like to be involved in social manufacturing activities (either as a consumer, maker, or manufacturing SME)					
Q20_3. - be interested in participating in workshops, projects and training activities for digital modelling and fabrication.					
Q202_4. - be interested in using a digital platform which would allow me to have access to digital tools, receive training, get in touch, and share my ideas, etc.					

Digital Platform for Social Manufacturing / Matchmaking & Collaboration

We are in the process, within the iPRODUCE framework, of creating a new Digital Platform for Social Manufacturing that will aim to connect makers, manufacturing SMEs and consumers. Your feedback in the following statements, could significantly contribute to the development of a platform that would better respond to your preferences

	1	2	3	4	5
Q21. Which features do you consider necessary in a Digital Platform (Web) for Social Manufacturing? (Choose to what extent each feature is crucial, 1=Not at all, 5=Extremely crucial)					
Q21_1. - Easy-to-use digital tools (e.g., design thinking tools, generative design platform, Augmented Reality (AR)/ Virtual Reality (VR) modelling)					
Q21_2. - List of makerspaces/Fablabs' manufacturing equipment					
Q21_3. - Inspection and metrology tools for quality control					
Q21_4. - Technical lectures and mentoring from qualified experts					
Q21_5. - Training activities (e.g. to enhance the skills of DIY on how to use Fablabs' tools and machinery)					
Q21_6. - Social network tools (e.g. discussion Fora)					
Q21_7. - Communication and matchmaking services between SMEs and makers based on skills, experience, and needs.					
Q21_8. - Contact points for experts (experts' pool with profiles so that other makers/SMEs can seek assistance)					
Q21_9. - Collaboration tools (e.g., tools enabling remote collaboration)					
Q21_10. - Other					
Q21_11. (Other) Please specify: (max. 200 characters)					

Q22_1. Do you believe that the Management of Intellectual Property Rights (IPR) should be addressed in a Digital Platform (Web) for Social Manufacturing?

[ ] Yes [ ] No [ ] Do not know/No opinion

Q22_2. If yes, which of the following IPR categories would better reflect your needs for safeguarding your project?

- ☐ Copyright
- ☐ Patent
- ☐ Trademark
- ☐ Smart Contract

Q23. Matchmaking services: Which of the following aspects would you consider helpful for searching for suitable partners online? (*please select all that apply*)

- ☐ Sector/Industry
- ☐ Location
- ☐ Materials Used
- ☐ Skills/Know-how
- ☐ Type of product
- ☐ Services provision
- ☐ Technology
- ☐ Equipment
- ☐ Activity (design, paint, manufacturing, assembly etc)
- ☐ Certification or accreditation
- ☐ Partner Type (e.g., individual, SME, large)
- ☐ Any other (*text box*)

Q24. Matchmaking services: Which of the following criteria would you consider essential for selecting partners online for your collaborative project? (*please select all that apply)*

- ☐ Previous experience or past relationship
- ☐ Certification or accreditation
- ☐ Location e.g., same city or country
- ☐ Partner Type (e.g., individual, SME, large company)

Q25. Collaboration: What do/would you use to manage activities in collaborative networks? (*please select all that apply)*

- ☐ Phone/Internet calls
- ☐ Emails
- ☐ Face to Face meetings
- ☐ Digital collaboration tools (Slack, Microsoft Teams, Google Meet, etc.)
- ☐ Other (*text box*)

Q26. Collaboration: For which of the following activities do you think collaboration with partners is required? (*please select all that apply)*

- ☐ Digital fabrication tools
- ☐ Hardware, machining
- ☐ Electronic prototyping
- ☐ Information technologies
- ☐ Software programming
- ☐ Photography, cinematography etc
- ☐ Wood working
- ☐ Metal working
- ☐ Electronics development
- ☐ Agile methods
- ☐ Other

General Information

Q27. Gender:

- Female
- Male
- Transgender
- Gender variant/Non-conforming
- I prefer not to answer

Q28. What is your age?

- Under 20 years
- 20-29 years
- 30-39 years
- 40-49 years
- 50-59 years
- 60+ years

Q29_1. In which country do you live?

- Denmark
- France
- Germany
- Greece
- Italy
- Spain
- Other

Q29_2. (Other) Please specify: (max. 200 characters)

Q30. What is the highest level of education you have attended?

- Less than a High School Diploma
- High School Diploma
- Bachelor's Degree
- Master's Degree
- Doctorate

Q31. Do you have previous experience in the fields of engineering or computer and information science (either academic or professional experience)?

[ ] Yes [ ] No

Q32. What is your occupational status?

- Employed
- Unemployed
- Self-employed/entrepreneur
- Student
- Household activity
- Retired
- Other

Q33. How would you classify the net household income of your family? (*non-mandatory question*)

- Low income
- Medium income
- High income

Q34. Do you live in a?

- Densely populated area (urban)
- Intermediate area (semi-urban)
- Thinly populated area (rural)

Survey end

Thank you for taking part in this survey and contributing to our understanding of what people think about makerspaces and collaborative manufacturing between individual makers and manufacturer enterprises.

Your input will help us a great deal to identify key elements and perceptions that should be considered during the implementation of our project.

Do you have any questions or comments? You can contact us at *info@iproduce-project.eu*.

Feel free to follow the iPRODUCE social media accounts for more information**!**

Twitter account (*https://twitter.com/iPRODUCE_EU*)

LinkedIn group (*https://www.linkedin.com/groups/8876687/*)

Informed consent

This privacy policy details information collection practises related to your personal data and other related information and the limited manner in which the iPRODUCE project will use and disclose the information provided to us when you responded the survey.

By participating in the survey, you voluntarily consent to the collection and use of your information by iPRODUCE as set forth in this privacy policy. If you have any questions concerning this privacy policy or our data collection practises you may contact us at *info@iproduce-project.eu*. We reserve the right to change this privacy policy at any time and inform all participants about the updates.

In addition to your opinion, we are collecting some personal information such as age, country of residence and educational status for socio-demographic purposes. The collected data will be saved and used until the end of the research period of the iPRODUCE project. The data will be only used for the purpose of the iPRODUCE project, funded under the European Union Horizon 2020 program, aiming to promote makerspaces and the maker movement across Europe.

The lawfulness of the processing of personal data is determined pursuant to Article 6 of the EU's General Data Protection Regulation (GDPR). With respect to personal data, the processing of personal data is based on consent.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 870037.