Makers as a new working conditions between self-employment and community peer-production. Insights from a survey on Makers in Italy.

Abstract:

Peer Production has emerged has a new and relevant way of organizing the work of distributed and autonomous individuals in the production and distribution of digital content. Increasingly, the adoption of Peer Production is taking place not only in the development of digital and immaterial content, but also in the design, manufacturing and distribution of physical goods. Furthermore, Open Design and Open Hardware projects are developed, discussed, manufactured and distributed thanks to digital fabrication technologies, digital communication technologies, advanced funding initiatives (like crowdfunding platforms and hardware incubators) and globally integrated supply chains. This new systemic dimension of work is possible, among other factors, thanks to local facilities like Fab Labs, Makerspaces, Hackerspaces (that can be generally called Maker laboratories), where individuals can gather and form communities with other people, designing and manufacturing together. Generally, these people are referred to as Makers, and, while their existence is still an emergent phenomenon, it is widely acknowledged that they could exemplify a new modality of work.

We investigated the knowledge, values and working dimensions of Makers in Italy with the *Makers' Inquiry*, a survey that focused on Makers, Indie Designers and managers of Maker laboratories. This research generated a first overview of the phenomenon in Italy, identifying the profiles of such Makers; an important step because Makers are usually defined in a very broad way. Furthermore, we investigated their profiles regarding their values and motivations, in order to understand how much Makers engage in Peer Production or in traditional businesses and whether their working condition is sustainable or not. Finally, we compared these profiles with data regarding traditional designers and businesses, and we gathered a first analysis of policies regarding Makers, Maker laboratories and their work in order to understand the strategic context where Makers could work in the future.

Far from happening in a void, Italian Makers have a strong relationship with their localities and established industry. Therefore, this is a recent evolution, where Makers work with a broader palette of projects and strategies: with both non-commercial and commercial activities, both Peer Production and traditional approaches. The activity of making is still a secondary working activity that partially covers the Makers' income, who are mostly self-employed working at home, in a craft workshop or in a Fab Lab in self-funded or non-commercial initiatives, where technology is not the only critical issue. As a conclusion, we identified current patterns in the working condition of Italian Makers and we developed our recommendations for institutions in order to facilitate the recent phenomenon of Makers in Italy in a more stable and organized sector.

The data gathered shows some interesting information, that could be however, strictly applicable to an Italian context. Nevertheless, the survey could be a starting point to compare the same phenomenon in different countries. Therefore, we released the survey files, software and data as open source in order to facilitate the adoption, modification, verification and replication of the survey.

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1. Introduction

The introduction of digital technologies in the past decades has changed society and economy and therefore also, beside many other aspects, working conditions. New forms of organization and new forms of distribution of resources have been enabled (or old forms have been modified or rendered obsolete) especially thanks to infrastructures such as the Internet (a global network of devices and technologies) and the World Wide Web (a global network of information and documents). Furthermore, there are also protocols and softwares that manage the interaction between both of these networks. Digital technologies have always been in part digital and immaterial with data and software, and physical and material with hardware and connections. This ecosystem has enabled the emerging of new forms of work, organization, business and economy in many fields such as music, biotechnology, movies, science, art and and so on, including design. Free Software, Open Source, Peer-to-Peer, Crowdsourcing, Sharing Economy, Diffuse, Distributed and Decentralized Systems are some of the many new definitions created in order to understand better the new phenomena of organization of work emerged thanks to digital technologies, and especially Internet and the World Wide Web. The concept of Peer Production emerged as the identification of the common traits in all these definitions regarding a new and relevant way of organizing the work of distributed and autonomous individuals within the production and distribution of digital content characeri<ed by collaborative practices rather than competitive ones (Benkler, 2002).

This digital content, thanks also to the digitalization of an increasing amount of types of information, encompasses many fields and disciplines, making Peer Production a promising and generic way for organizing knowledge work in the future years. A new and relevant way for organizing the work on digital content, could also be restated as a new and relevant way for organizing the design of digital content, using design both as "to plan and make decisions about (something that is being built or created)" or "to create the plans, drawings, etc., that show how (something) will be made". Both are definitions of design according to the Merriam Webster dictionary ('Design', 2015), and could refer to a general or broader (or even informal) activity of developing a content or project (i.e. like professionals who are not trained as designers or amateurs do) or to developing a project following the methods, culture, history, tools and roles of the Design discipline (i.e. designers). For example, software is a digital content that can be '*designed*' (usually by people formally trained in software development, computer science, engineering, but increasingly by people with an informal training); the design of websites is a specific form of software (and therefore digital content) that can be designed (usually by people formally trained in design, art, architecture, but increasingly by people with an informal training).

Therefore Peer Production can be applied to Design, but other phenomena in the past two decades have shown that it could have not been necessarily related only to digital Design projects. As we have seen, digital technologies are both immaterial and material, physical and digital. Increasingly, the adoption of Peer Production is taking place not only in the development of digital and immaterial content, but also in the design, manufacturing and distribution of physical goods. Furthermore, Open Design and Open Hardware projects are developed, discussed, manufactured and distributed thanks to digital fabrication technologies, digital communication technologies, advanced funding initiatives (like crowdfunding platforms and hardware incubators) and globally integrated supply chains. This new

systemic dimension of work is possible, among other factors, thanks to local facilities like Fab Labs, Makerspaces and Hackerspaces, where individuals can gather and form communities with other people, designing and manufacturing together. Generally, these people are referred to as Makers, and, while their existence is still an emerging phenomenon, it is widely acknowledged that they could exemplify a new modality of work (Anderson, 2012; Hatch, 2014). The physical dimension of digital technologies is now recognized as a promising dimension, and there is an increasing interest in developing products and services in this domain rather than just digital services: objects and manufacturing are more and more digitalized (Anderson, 2010; Gershenfeld, 2005).

If Makers adopt, even if partially, Peer Production strategies, an analysis of their working and economical conditions could give insights on the work dimension of the Peer Production of physical things. This could expand the possibilities of Peer Production, which has been mostly tied to digital content so far. Furthermore, such analysis could give more insights on the sustainability of such practices and therefore be a starting point for suggesting policies for facilitating a sustainable development of such practices. This article tries to address this situation, trying to answer the following related questions, but limiting them to the context of Italy:
1. which is the working condition of Makers?
2. how is Peer Production with physical goods taking place in the work of Makers?
3. which are the existing and possible policies that could help both Makers and Designers regarding their working conditions, and possibly even Peer Production?

In order to answer such questions, we adopted two approaches: a literature review (in order to understand existing approaches) and an open online survey (in order to understand the emerging condition of Makers in Italy). We investigated the knowledge, values and working dimensions of Makers in Italy with the *Makers' Inquiry*, a survey that focused on Makers, Independent (Indie) Designers and managers of Maker laboratories (Bianchini, Menichinelli, Maffei, Bombardi, & Carosi, 2015). This research generated a first overview of the phenomenon in Italy, identifying the profiles of such Makers: an important step, because Makers are usually defined in a very broad way. Furthermore, we investigated their profiles regarding their values and motivations, in order to understand how much Makers engage in Peer Production or in traditional business practices, whether they work with open source and collaborative processes or individually, whether their communities have a strong role in their work or they are just a dimension with limited relevance. We then investigated their emerging business and working condition: their market, expenses and commercial strategies, and the patterns regarding the ownership, access and use of manufacturing technologies. Finally, we compared these profiles with data regarding traditional designers and businesses from existing literature, and we analyzed existing policies and proposed new ones beside ideas for future research on this topic.

2. Peer Production and Makers: physical things, physical places

The Internet and the World Wide Web have allowed to scale up projects in ways that were previously considered impossible, where complexity stops being a problem and could become a positive feature. But with the emergence of Free Software and Open Source projects and, more specifically, with the project of the Linux kernel, practitioners and researchers have started to witness how the participation

of a huge community inside a project could represent a promising direction for the organization of work. In the Linux kernel, for example, nearly 12,000 developers from more than 1,200 companies have contributed to the project since 2005 (Corbet, Kroah-Hartman, & McPherson, 2015). One of the first practitioners who reflected on the success of Linux, Eric Raymond, suggested a *"Linus' Law"* that stated that given a large enough community of users and co-developers, every problem would be identified and fixed quickly (Raymond, 1999). Some researchers have proposed an explanation of such success by claiming that the success of such a project lays in building a complex system of users that can then face successfully complex projects (Kuwabara, 2000). These principles and practices have spread also to different domains than software development, showing a promising strategy for organizing design, work and management of complex projects (Goetz, 2003).

Among the many new definitions created in order to understand better the new phenomena of organization of work emerged thanks to the digital technologies, Peer Production has emerged as the explanation and generalization of these processes. The term was coined by Yochai Benkler (Benkler, 2002), who analyzed many cases of collaborative design (intended with a broader definition) through the dimensions of organization and management and proposed Peer Production as a third way for organizing work and business beside market and managerial hierarchy. Benkler generalized from the phenomenon of Free Software to suggest characteristics that make large-scale collaborations in many information production fields sustainable. Central to Benkler's hypothesis is the claim that human knowledge, experiences and skills are highly variable and distributed: Peer Production is important not as a technological innovation, but rather as an innovation on the organization of work thanks to technology. In Peer Production, the distributed pool of users / designers participating in a project can better identify who is the best person for a task, with an improved identification and allocation of human creativity. As defined by Benkler (Benkler, 2016), Peer production is therefore an organizational innovation along three dimensions:

1. decentralized conception and execution, based on the self-selection of the participants at work on a modular organization of the project;
2. the coexistence of diverse motivations (including non-monetary motivations) allows the participation of a large community of participants;
3. the organization is separated from property and contract, with inputs and outputs mostly governed as open commons (hence the often used term of Common-based Peer Production); the governance of resources and tasks are based on a combination of   participatory, meritocratic and charismatic strategies rather than proprietary, contractual and hierarchical models.

According to Benkler, these characteristics define Peer Production against other definitions of mass-collaboration (or even mass-competition) phenomena: for example, in Crowdsourcing, the tasks are highly regimented and pre-specified by the management of a project, with the main goal of cost reduction, rather than distributed exploration of resources and possibilities. Peer Production has therefore been considered a promising framework for understanding and managing large projects of collective intelligence. The research on Peer Production, mostly developed in the field of social sciences and legal studies, has mainly focused on the topics of organization, motivation, and quality (Benkler, Shaw, & Hill, 2015).

As defined by Benkler and many other scholars, Peer Production is based on information for the self-organization of participants and as the basis of the projects developed: the work is organized thanks to digital tools and data and consists on the collaborative development of modular projects of digital content. Thanks to ICT technologies, the costs for working (and distributing) digital content have lowered dramatically, making it easier to work on a large scale with digital content. There have been, however, many attempts at defining and experimenting how Peer Production could be applied to physical products beside only digital content. As noted by Clay Shirky, this could happen because *"An increasing number of physical products are becoming so data-centric that the physical aspects are simply executional steps at the end of a chain of digital manipulation"* (Shirky, 2007). Early attempts at defining Peer Production for physical goods tried to understand a scenario of a society in which peer production is the primary mode of production, fulfilling the old Marxist postulate that control over the means of production should be in the hands of the producers, more specifically as commons (Siefkes, 2008). The most critical issues considered by Christian Siefkes were the coordination of the production with the consumption and the allocation of physical resources and goods (which, being rival goods, are limited, cannot be completely shared and are costly to distribute). Here digital fabrication is already seen as a possible way for supporting these processes by allowing personal manufacturing as proposed by Neil Gershenfeld (Gershenfeld, 2005), but not for completely solving all the issues of Peer Production for physical goods. Michel Bauwens also reflected on the possibilities for the Peer Production of physical things, proposing Open Design, Open Manufacturing, Open Money and P2P Energy Grids as its main strategies (Bauwens, 2009). In order to produce physical goods, there are inevitable costs of getting the capital together, and there needs at least to be cost recovery in order to make a project sustainable, therefore Peer Production as it emerged in digital content cannot be completely adopted. But Bauwens suggested that the design process is the link between Peer Production and physical goods, since it is now largely an immaterial software-based process depending on the collaboration of several people. Therefore a possible strategy could be the link between shared projects (Open Design) that can be prototyped and compiled in Maker laboratories like Fab Labs, Makerspaces and Hackerspaces (Open Manufacturing) or with Open Hardware technologies like the RepRap 3D printer. Open Money and P2P Energy Grids are further elements that improve the sustainability of these issues on the financial and energetic dimensions.

Beside few theoretical contributions about possible scenarios, a relevant amount of contribution has come from the practice of Open Design (Abel, Evers, Klaassen, & Troxler, 2011) and Open Hardware (Thompson, 2008) projects, where first projects of physical goods were designed and manufactured and many organization, legal and business issues have been faced. Researches on early Open Design projects (Raasch, Herstatt, & Balka, 2009) showed it to be implemented in a substantial variety of projects with three different loci of production (external manufacturers, community or the focal organization coordinating the project). In some cases examined there is no clear-cut separation between design, prototyping, and production in the community. Furthermore, it is important to point out that the researchers found some limitations to openness of the projects caused by the attempt to balance the interests of the designer community and commercial companies involved like suppliers or manufacturers. Another research (Balka, Raasch, & Herstatt, 2009) found strong relationships between the stage of advancement of the development of Open Design projects and the size of the community, the presence of commercial contributors, and the intensity of cooperation. However, the research reports that the number of people involved in the analyzed communities mostly falls into the 2-10

range, with the range of 11-100 coming as second place, the range of only 1 participant as the third place. The range of more than 100 participants is the last place, showing how Peer Production with physical goods was still limited to few participants, compared to how its application to digital content was mostly considered relevant for the ability to scale to thousands of participants.

Open Design and Open Hardware are therefore the projects where Peer Production is meeting physical goods, and their acceptance and relevance has growth after the researches on the early cases (Menichinelli, 2011a, 2011b, 2011c). It has been suggested that if Open Design and Open Hardware can be compared to the '*books*' of Commons-based Peer Production, then Maker laboratories are its libraries, that act as common points of access to stored knowledge and where new knowledge can be produced by providing general access to the tools, methods and experience of Peer Production (Troxler, 2011). Furthermore some of these spaces, especially Fab Labs, do not only provide local access to digital and traditional manufacturing technologies, but also requires the users to share their knowledge (CBA, 2012). Some researches, however, have shown how the sharing of projects and documentation is still limited. On the first side, an empirical study based on qualitative interviews with Fab Lab users showed that the sharing of documentation and projects is limited by the difficulty of documenting (especially tacit knowledge) and by the growth of the global Fab Lab community. Interestingly, these motivations are not the same for global online platforms, identified by the researchers in previous literature (Wolf, Troxler, Kocher, Harboe, & Gaudenz, 2014).

If Fab Labs, Makerspaces, Hackerspaces are libraries for the Peer Production of physical goods, then the readers who come to these libraries are widely regarded to be the Makers. The term '*Maker*' has been generally referred to people who autonomously engage in the design and production of physical goods, from craft to electronics. Chris Anderson (Anderson, 2012) extends this definition stating that, furthermore, they use digital desktop tools to design and prototype new products; they follow cultural norms that prescribe to share and collaborate on those designs in online communities; they use common design standards that could enable the manufacturing of these projects by many actors and organizations beside the original designers or manufacturers. An empirical study of the development of the Maker identity shared by members of a small town Hackerspace discovered that the identity of an established Maker is based on the development of a tool and material sensibility, on the adoption of an adhocist attitude and on the engagement with the broader Maker community (Toombs, Bardzell, & Bardzell, 2014). Makers are generally considered a new kind of work which could generate new business and employment, with new dynamics, technologies and markets (Anderson, 2010, 2012; Hatch, 2014). The emergence of Makers is however still recent (the birth of the term is generally considered to be 2005 with the launch of *Make Magazine*), and there is still a gap in the literature regarding the working conditions of being a Maker. The link between Peer Production and physical goods has been therefore established in the practice thanks to Open Hardware and Open Design projects, developed and manufactured in Maker laboratories by Makers. The research on this topic is however still early, and while many contributions point to limits and differences in Peer Production of physical goods, compared to digital contents, more focus is needed on the organization and the working conditions of such approach.

3. Makers' Inquiry: a national investigation on a new condition in Italy

The term '*Maker'* and the whole global ecosystem of Maker laboratories are recent phenomenon, and this aspect is even more relevant in Italy, where the first (temporary) Fab Lab was established in 2011, years after many other countries had one (Menichinelli & Ranellucci, 2015). In order to explore the social, economic, cultural and technological dimensions of Makers in Italy, we set up the *Makers' Inquiry*[1] as an online survey developed during 2014. Italian Makers have been analysed in terms of which skills and capabilities they present, what kind of places they work in, which design processes they follow and what is their social and economic status together with their working conditions. There are several different interpretations of the term '*Maker'*, and it is still difficult to understand how many Makers are in Italy and where they are (and therefore it is also difficult to reach them). For this reason we decided to develop an open online survey in order to explore the emerging community of Italian Makers, rather than trying to precisely identify and quantify who are the Makers. We provided three different meanings to the term *Maker*, from which participants could choose at the beginning of the survey:

- Makers as commonly understood and described in *Make Magazine* and other related authors (Anderson, 2012) (i.e. Makers as technologically advanced people who tend to use digital technologies for communicating, manufacturing and sharing their projects).
- Makers as craftsmen, designers and entrepreneurs who produce their own projects independently (i.e. Makers as Indie Designers);
- Lab managers, considered both as laboratory managers and as design facilitators (i.e. Makers as managers of Fab Labs, Makerspaces, Hackerspaces - or Maker laboratories -).

We chose to reach potential Makers through online communities (the Facebook group *Fabber in Italia*[2]), Maker laboratories and specific communications organized by the Make in Italy CDB Foundation and the Make in Italy Association.The survey was officially launched in July 2014 and closed at the end of October 2014: 214 participants completed part of the survey (which was composed by 62 questions divided into different sections), and we chose to focus only on the participants who completed more than 50% of the questions, who were 134 participants. The online platform for the *Makers' Inquiry* has been developed with open source software and the scripts that has been specifically developed in order to manage information and elaborate data and graphs are also accessible online as open source software[3]. Consistently, the results of the survey have been released online as open data[4], accessible to the general public, the research community and the Maker community through a book (Bianchini et al., 2015), and within the 2015 Cumulus conference (2015), in a paper investigating the Design education system evolution in the era of digital fabrication which was taking into consideration the results of the *Makers' Inquiry* (Menichinelli, Bianchini, Carosi, & Maffei, 2015). The survey has focused only on the

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[1] The *Makers' Inquiry* (http://makersinquiry.org/) was developed and coordinated by the Department of Design of Politecnico di Milano with the collaboration of the Make in Italy Foundation CDB (http://www.makeinitaly.foundation) and the Make in Italy Association (www.makeinitaly.org/); it was also supported by the DESIS Network (http://www.desis-network.org/).

[2] The Facebook group *Fabber in Italia* can be accessed at this address: https://www.facebook.com/groups/fabberintialia/

[3] The scripts can be accessed at https://github.com/openp2pdesign/Makers-Inquiry---Analysis

[4] The data and publications elaborated from the *Makers' Inquiry* can be downloaded from http://makersinquiry.org/ and http://opendata.makeinitaly.foundation/

Italian for the moment but there is the intention to spread the research in other countries[5] worldwide thanks to the collaboration with other international institutions. In this way, the *Makers' Inquiry* could allow the comparison of data from national Makers communities becoming a shared and collaborative tool for understanding Makers. The online platform could also, at the same time, become a shared repository for researches and data about Makers and Maker laboratories.

This article proposes a discussion from just a selection of questions composing the whole inquiry, in order to highlight the most important aspects regarding the connections among Makers, Maker laboratories, Peer Production and work. We analyzed the social, educational and economic dimension of Italian Makers, as a background for their working conditions and participation in Peer Production practices. First of all, the age of Makers ranges from 21 and 60 years old but the majority of them is between 30 and 40 years old, with a peak at 36 years (Fig. 1). The age of Italian Makers falls mainly in the range of the working-age, showing how the identity of Makers could be linked to work. The majority of the participants lives with her/his partner (30.5%) and children (21.6%); less than 15% live alone or with her/his parents. Furthermore then, the Italian Maker scene is mostly composed by adults who have a family. Regarding their gender, 72.4 % of them self-identifies as male, 23.4 % as female and 3.7 % prefers not to reply to the question.
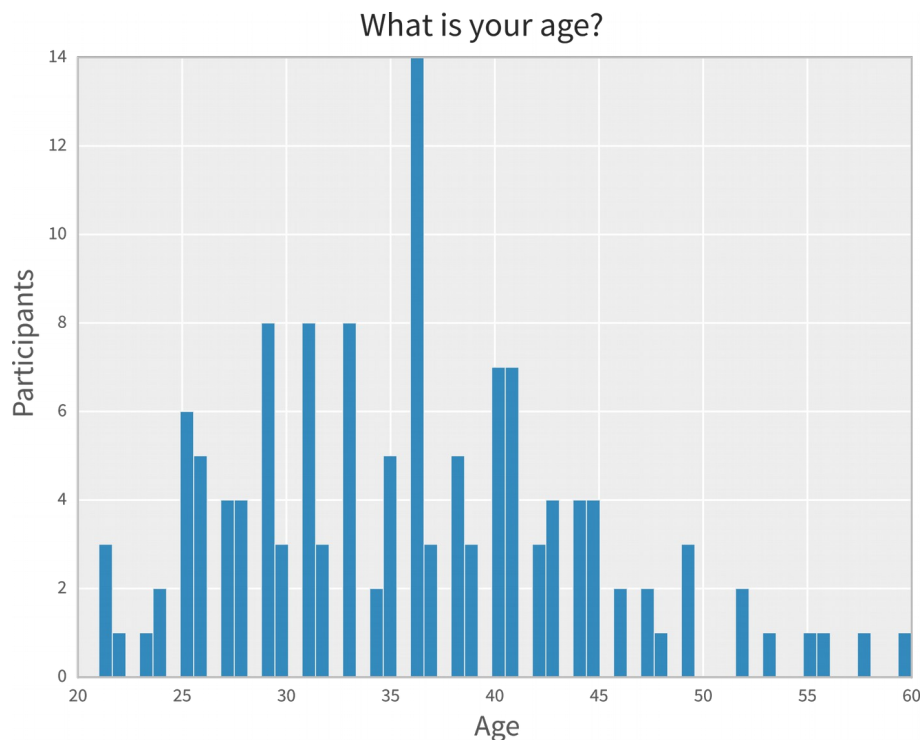

Fig. 1: The distribution of the age of the participants in the survey

Italian Makers are mostly highly educated and able to relate with international subjects: 88.8% of the participant speak English, 44.7% of them has a Master degree, 13.4% affirms to have a Bachelor degree

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[5] At the moment of writing, there are already established contacts for replicating the *Makers' Inquiry* in France, China and Australia.

and just 17.1% of them obtained only a high school diploma. The fields of specialization of Italian Makers are mainly related to industrial design, architecture and engineering (i.e. mechanics, informatics and electronics); confirming therefore the identity of Italian Makers as based on the integration of both creative and technical skills. Considering the age range and the education degree, it can be stated that Italian Maker community start its activity during the finalization of his educational paths.

We then investigated the role of making in the economic and working conditions of participants: making is mainly considered a secondary or complementary activity for the majority of the sample (54.4%). It is interesting to highlight that only less than 1/3 of the subjects (26.1%) consider it as a primary activity while for 1/5 of the interviewed it is just a hobby (19.4%). Therefore making is not just an amateur activity for them but it consists of a sort of serious profession in the principal working period of subjects life, even if only to a partial extent. In particular, as making is not considered the main activity of italian makers, their principal occupation has been analysed. The majority of the sample (31.3%) declares to be mainly working as freelancer, while 10.3% are entrepreneurs and 19% are employed and just 6.7% are students. It can be stated that, in respect of the typology of work, the Italian Maker community is mainly composed by professionals who work in an independent and autonomous way, without being part of established companies (Fig. 2) Interestingly, 21.6 % of them did not reply to the question (this is the most common value after being a freelancer), showing how the working conditions is less clear or it does not fit in conventional formats.
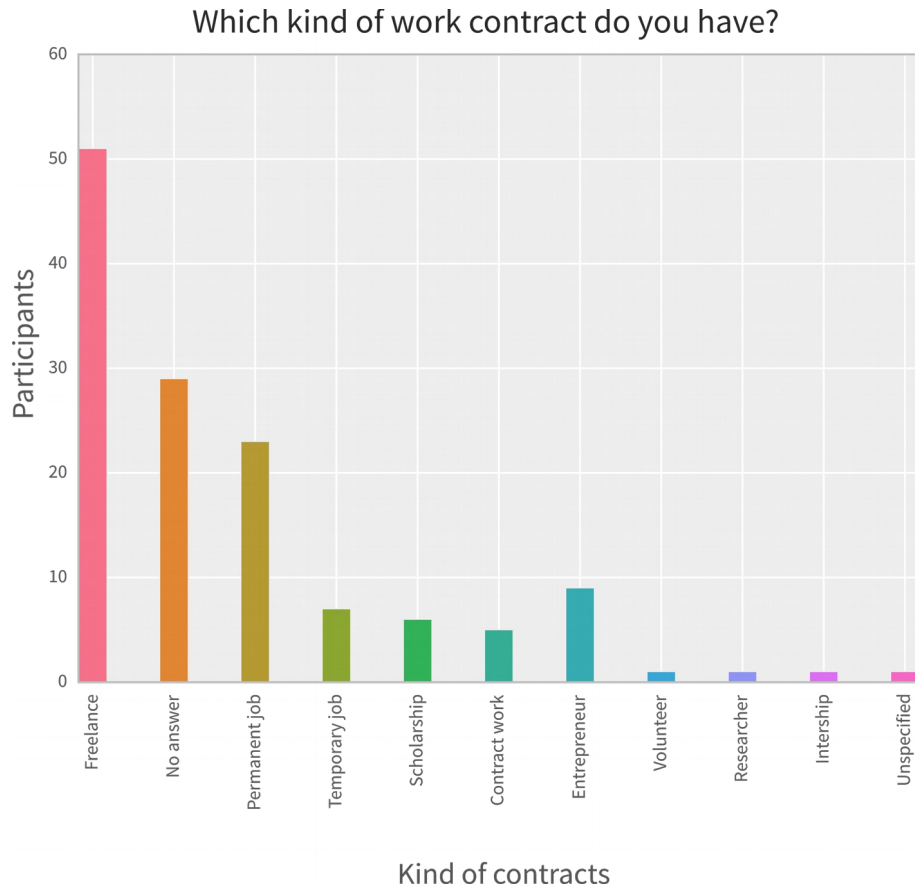
Fig. 2: The work contract of the participants in the survey

Referring more specifically to the working condition regarding its formalization (work contracts), 1/3 of subjects (31.3%) works as freelance (with or without VAT), while 17.1% has an open-ended contract pointing out that making mainly is an independent and autonomous activity. Therefore, even if making remains still an emerging phenomenon, it can be considered as a new way of working professionally and not just a hobby. On one side there are entrepreneurs and professionals of self production and making, and, on the other, individuals who deal with making as an integrative activity, maintaining another principal job. We investigated also the sustainability of the yearly income of Makers: the majority of participants (36.5%) has between 10,000 and 25,000 €, while only 10.4% of the subjects have no income at all and 23.1% of them earns between 0 and 10,000 €. On the higher end, 17.1% of them earns between 25,000 and 50,000 € (Fig. 3). The Italian average pro-capita salary corresponds to 20,678 € (Cnel & Istat, 2014): therefore it can be stated that makers are still experiencing an initial phase of their career in terms of retribution, and the majority of them earns less or a bit more of the national average.
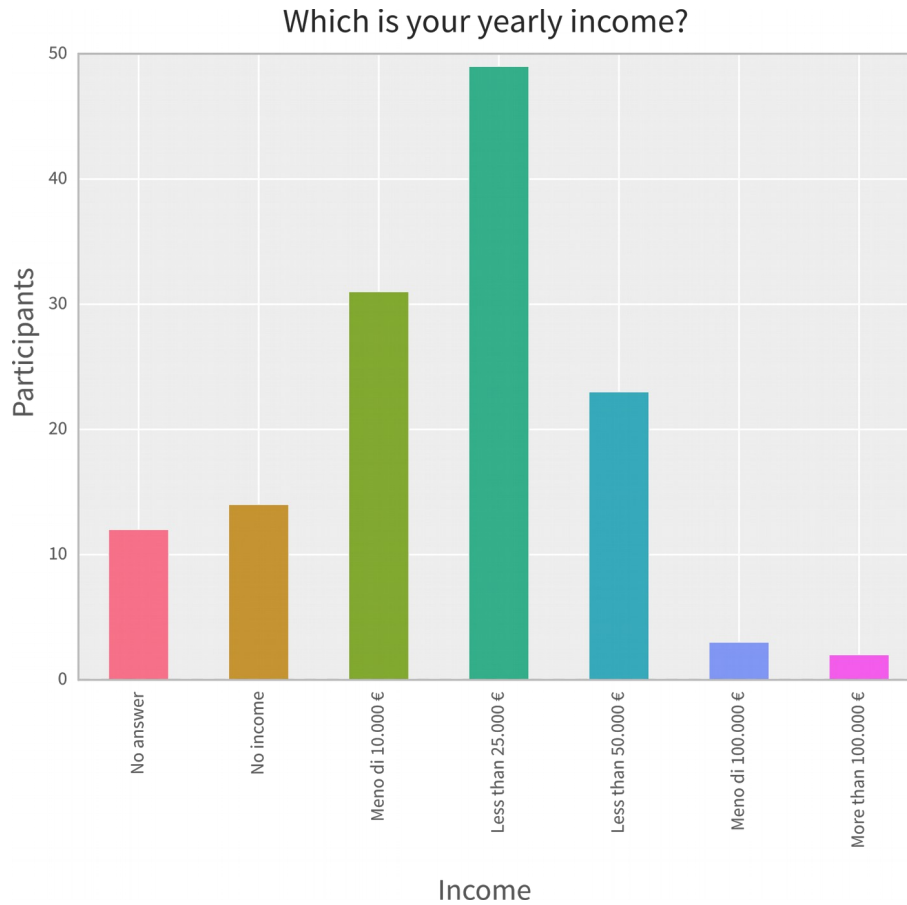
Fig. 3: Yearly income of the participants in the survey

Indeed, when it comes to define the percentage of earnings directly deriving from making activities and self-production, a huge percentage of people did not answer (Fig. 4) showing how little impact making has on income or how little it is impact is clear, or how sensitive this question could be. Among the ones who answered, making has been confirmed as a secondary activity: for 31.1% of the subjects it contributes just in a minimum part of his salary (from 0% to 30% of the total income). A smaller group of people (9.5% of the sample) earns from it between 40% and 70% of his income while just 11.4% of subjects obtains from it between 80% and 100% of their income.

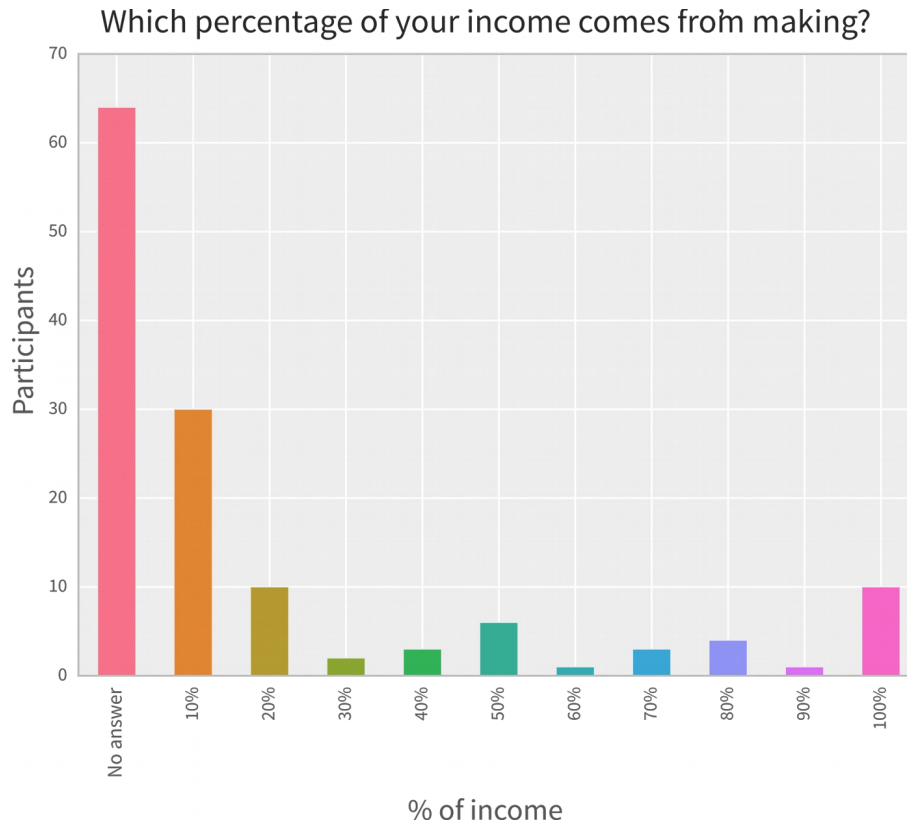**Which percentage of your income comes from making?**

Fig. 4: Percentage of income coming from making for the participants in the survey

The activity of Italian Makers is mainly focused on producing prototypes (56.7%) and then manufacturing products in small series (47.7%), personalized products (44%) and unique pieces (40.2%). Referring to quantities, 34.3% of the sample concentrates his work on 10 units/year, while 29% works on mini series (18.6% until 50 units and 10.4% until 100 units). Just 12.6% of subjects declares to produce more that 100 units per year. In relation to the target audience, makers seem to sell a small amount of products to a wider audience of clients: professionals, private clients, distributors, traditional enterprises, and so on.

Their principal market (26.8%) consists of freelancer, traditional companies (20.1%), artisans (13.4%) and other Makers (13.4%). This data could suggest the existence of a particular professional B2C channels in addition to the classical B2B one. Furthermore, Italian Makers sell their product and services through B2C channels through distributors/traders (19.4%) and private clients (11.19%). Eventually there is a notable amount of subjects who support makers' market and encourage their activities; 23.1% are composed by friends and relatives while 6.7% are investors (crowdfunding or venture capitalist). In conclusion, the great majority of Italian Makers mainly rely on their own resources through self-financing (71.6%) and, in a lower amount, through the resources they gain thanks to the sale of their product and services (46.2%). Just a small number of subjects rely on loans and credits (9.7%) or social financing like crowdfunding (8.2%). It can be stated at this stage Italian makers are characterized by a traditional small business approach, investing enthusiasm and energy within an activity they like, relying mainly on their personal and private resources.

This data highlights a positive fact: making activities are starting to add some economic integration to existing income for the people who undertake them. In some cases, such activities can become a professional opportunity for work: making is evolving from a hobby activity to a proper job. One of the reasons of this condition could be addressed to the recent starting of this phenomenon in Italy, where making can be still considered a quite recent movement. Indeed the majority of Italian makers (60.4%) have been involved in making activities since the last five years; 17.9% declares to have been involved making activity since less than one year while 19.3% practices making since more than 5 years. The increasing interest towards making could be then linked to the global spread of Maker Movement, but also with the Great Recession that took place in the years after 2007: interest in making could be a consequence of the spreading of the meme of Makers, but also as a consequence of the need for finding newer work opportunities in a period of crises through self-employment. Furthermore, the phenomenon of Maker in Italy has emerged more recently than in other countries, but it has found a prior "making knowledge" already embedded into the historical Italian industrial districts. There is, in fact, an interesting overlap between the territorial concentrations of Italian Makers within historical industrial districts and urban contexts (Fig. 5). 27.5% of the participants lives in urban contexts (20,8% lives in Milan, Rome and Bologna as a whole) but 75 places have been mapped through the whole country. The higher concentration of Makers can be found in North and Central Italy, partially superimposed to the pre-existing geography of Industrial district. Moreover, many Maker laboratories and Italian manufacturers of digital fabrication technologies[6] have a strong link with local productive systems. This means there could be a partial continuity between the a traditional local production and an emergent working conditions of Makers.

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[6] 3D printing companies like WASP, ShareBot, DWS and HLS Italia originated from industrial districts.

Map of the Italian Makers participating in the survey
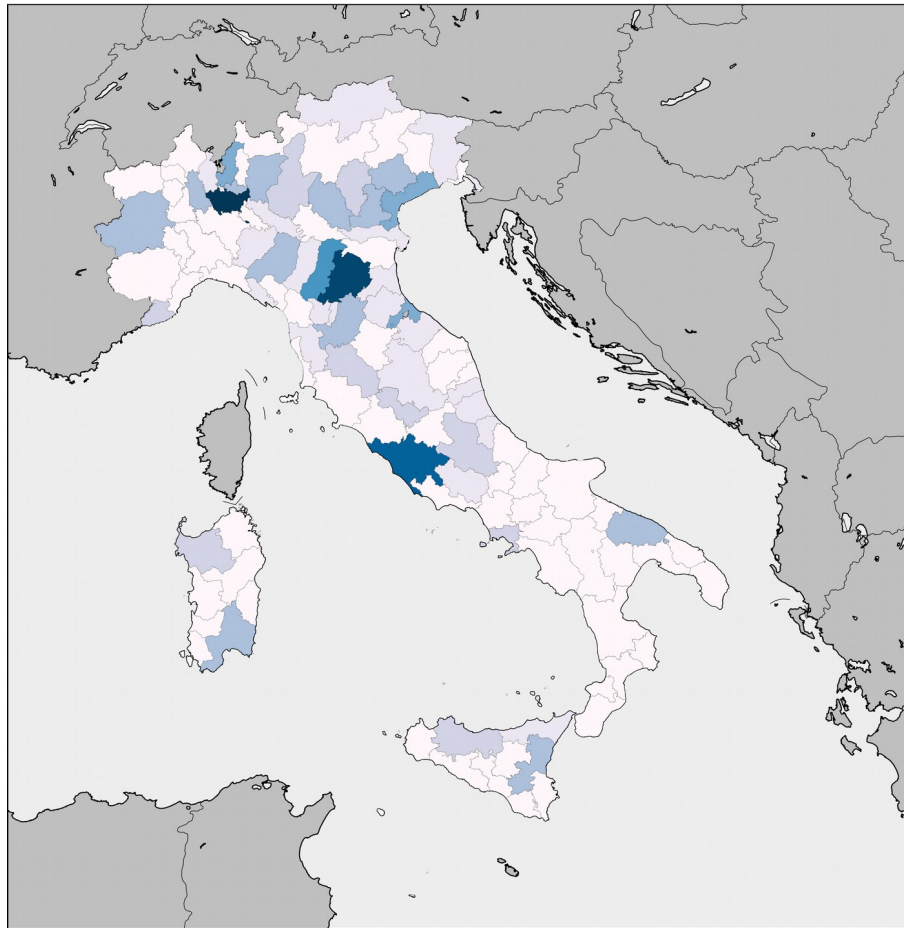
Map borders: ISTAT

Fig. 5: Geographical distribution of the participants in the survey

We also investigate up to which extent the working conditions of Makers in Italy can be related to Peer Production. We did not ask a specific question about Peer Production, but we asked several questions regarding many aspects of Peer Production: motivation for working, type of projects and approaches, values, participation in online and local communities in Maker laboratories.

Regarding the motivations leading people to participate in making, the first motivation is the will to experiment (74.6%), followed by the interest in creating a product-service or launching an enterprise (64.9%) and then by the interest in learning (60.4%). However social aspects like collaboration with other people is an important motivation only for 39.9% of subjects: a relevant percentage, but less than half of the participants are interested in collaboration. The idea of participation in making as an alternative for the capitalistic model of production and consumption of goods is accepted only by half of the participants (50.7%). In a similar way, a little bit less than half of the participants (44%) participate in making for the possibility to generate a positive impact on their local community. In terms of keywords association, Italian Makers associate the term '*making*' with several different dimensions (Fig. 6). In first place they relate it with self-production as an activity (75.3%), followed by Digital Fabrication as technology (52.9%), then with Fab Lab / Makerspaces as places (61.1%) and DIY as an approach (51.4%). It is interesting to note also the association with the theme of Openness (Open

Design, Open Hardware, Open Source Software) (39.5%) and with the Collaboration and Sharing condition (47.1%). Even if the majority of makers do not associate making with openness, collaboration and sharing of knowledge and goods, a notable amount of participants do so. Therefore it can be stated that collaboration and openness is still an emerging idea related in making activities, not fully widespread but already present and relevant.
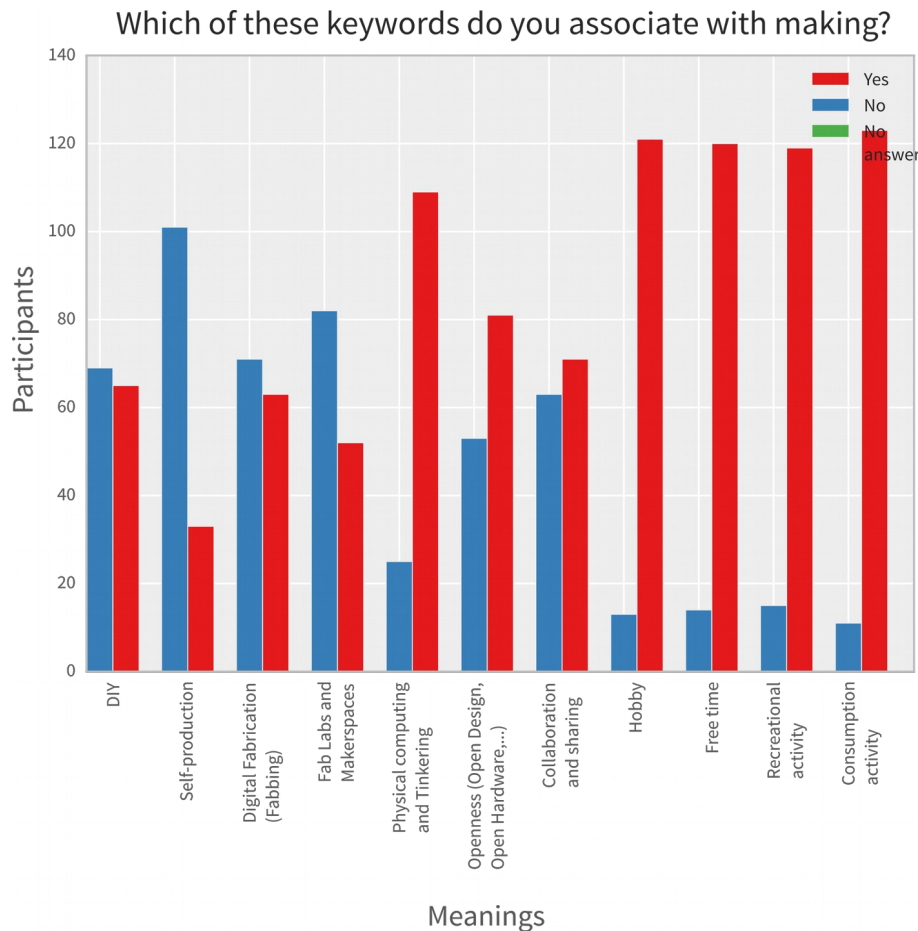

Fig. 6: Keywords associated with 'making' by the participants in the survey

At the same time, even if sharing and collaboration are not clearly associated with making, the majority of the participants stated that they are more important than general information, technical knowledge, the organization of initiatives, places for work and files and resources. Sharing and collaboration, therefore, are not considered to be originating from making, but are the most important trait. More insights about the approach to sharing and collaboration can be gathered from the question where we asked the Makers to choose an approach for their design processes (Fig. 7). While the majority of Makers prefer to start their projects from scratch (79.1%), Tinkering and Open Design follows at almost the same percentage each other (41.8% and 40.3% respectively). Co-Design with a community then follows (20.9%) and Generative Design tools and approaches are the last option (9.7%). While Makers

may still prefer to work individually, especially while experimenting with the materials at the same time of designing, the Open Design approach is highly relevant here.
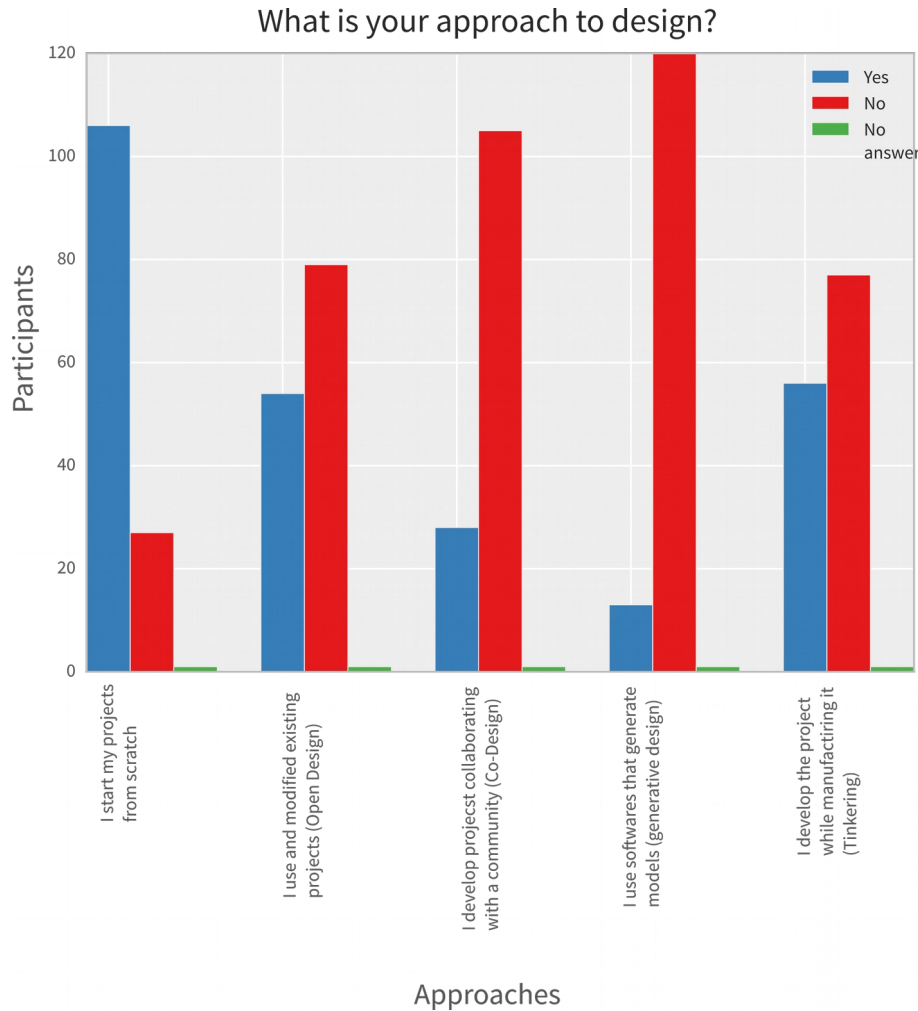

Fig. 7: Approaches to design processes by the participants in the survey

We then investigated to which extent Italian Makers participate in an online community or in local laboratories. The majority of them participates in an online community, specifying that they are members of the community (41.8 %) or that they participate while not being a real member (23.8%); 34.3% of them do not participate in an online community of Makers. The size of these online communities are mostly under 50 members (41.8%), but a relevant number of participants (26.8%) did not reply to the question, probably because they are not aware of the size of their community. The activities of these communities that the Makers participates in are also a good sign of the amount of collaboration and sharing (Fig. 8). Makers mostly follow activities passively (55.2%), but also download contents (26.8%) produce and share contents (25.3%). While sharing and downloading contents are activities with almost the same percentage (but with a higher proportion of unanswered questions

compared to the other activities), active participation in working with other members takes place with a much less percentage: 11.2% for both the development of projects or events.
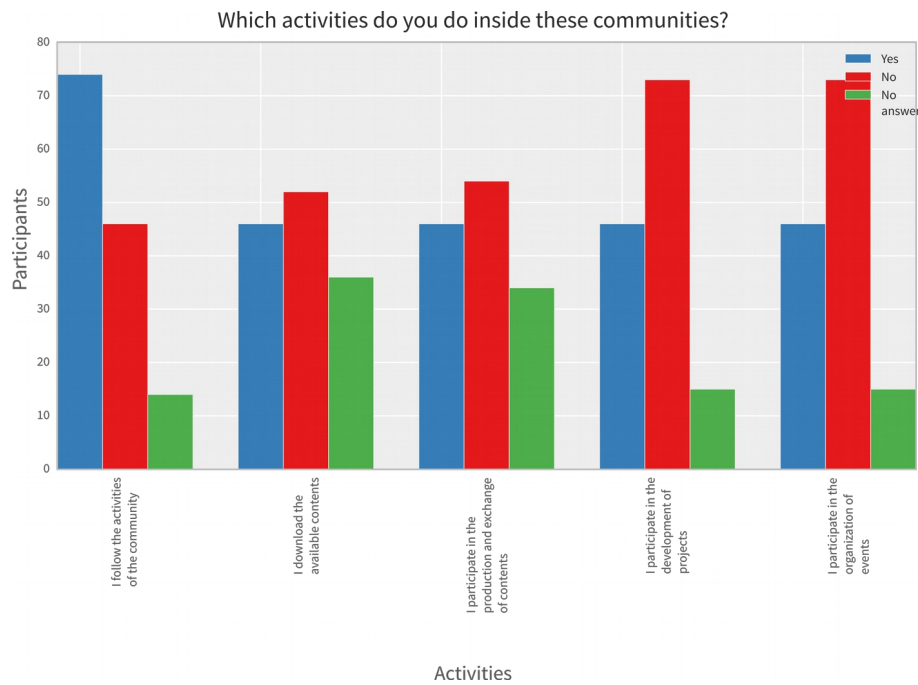

Fig. 8: Activities in online communities by the participants in the survey

Regarding the participation in a local Maker laboratory, 53.7% of the participants is active in one of them (even if with different levels of involvement), while 29.8% do not participate because they already own a private laboratory and 16.4% do not participate at all in a laboratory. These laboratories are mostly Fab Labs (35%), craftsmen's workshops (18.6%) or Makerspaces (5.2%) among few options. Here again we asked which kind of activities the Makers were participating in, and generally the participation and collaboration was higher than in online communities (Fig. 9). Inside laboratories, Makers follow activities (22.4%), develop their projects (49.2%) or projects with others (29.8%) or initiatives and events (27.6%).
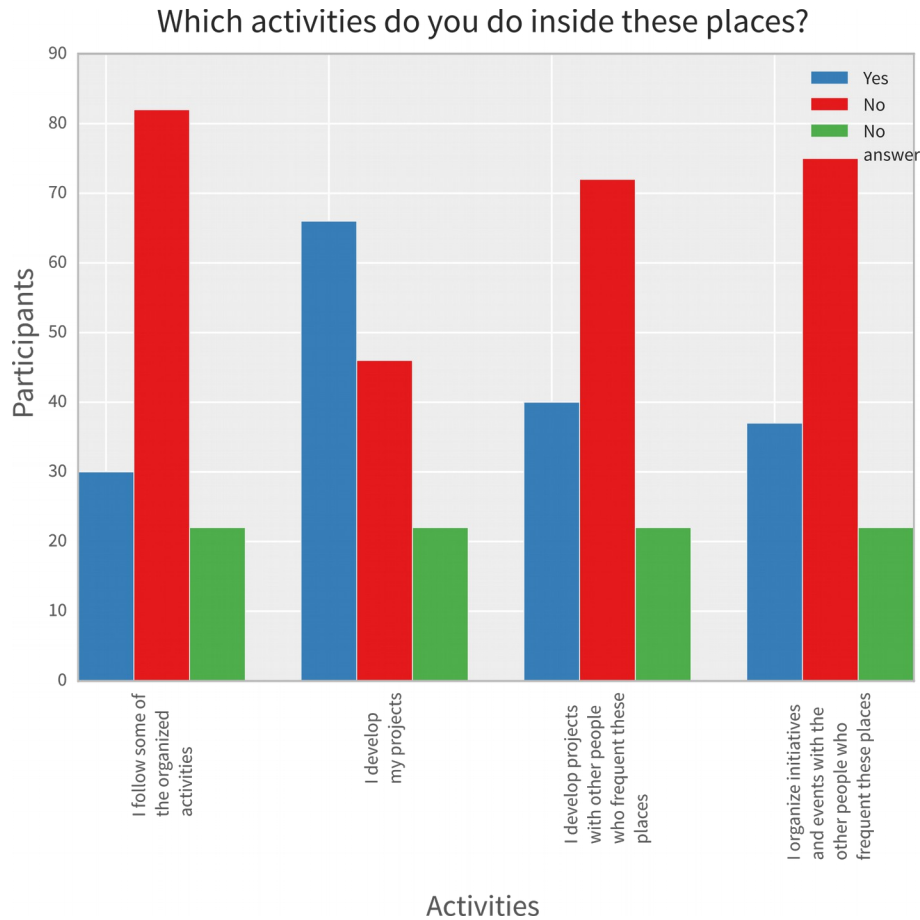
Fig. 9: Activities in Maker laboratories by the participants in the survey

4. Comparing national data from Makers' Inquiry and other sources

The *Makers' Inquiry* represents the first attempt realized in Italy (and maybe at international level, to our knowledge) to explore the world of Makers in various dimensions. This section of the article aims at comparing Makers' profiles and their work and economic condition resulting from the *Makers' Inquiry* with other researches developed at a national level; these researchers were developed within different fields but have a common relevance with making activities. We focused on one side the world of Design, with a specific focus on designers that self-produce their projects, and, on the other side, the world of Manufacturing that takes place outside Fab Labs, Makerspaces and Hackerspaces but that adopts their technologies. A preliminary consideration about the importance to analyze the Italian situation needs to be done: within western countries, Italy represents a notable context in which observing the transformation taking place in between the world of creativity and production. First of all, Italy founds itself in a leading position regarding the number of Fab Labs[7], and therefore it

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[7] According to fablabs.io, the official platform for Fab Labs, at the moment of writing Italy is the second country in the world for number of Fab Labs.

represents a relevant context for an analysis about Makers' condition. Secondly, Italy is one of the countries with the greatest amount of micro enterprises in Europe (Airaksinen, Luomaranta, Alajääskö, & Roodhuijzen, 2015), i.e. the organization dimension coincides with the individual one (employed or freelance), and this fact represent an interesting point for the contextualization of the system where Makers and Maker laboratories are located.

Therefore the first comparison can be conducted between the Maker and the figure of Indie Designers who follow the Designer=Enterprise or individual=organization model (Bianchini & Maffei, 2012). Few official statistical data about designers' working conditions in Italy (but also abroad) exist, and, in particular about Indie Designers. The latest information is dated 2013 (referring data from 2012) and is contained within the *Sector Study* created by the Income Revenue Authority which describes *"Industrial and fashion design activity"*[8] and *"Other design activity"*[9]. The study investigates the fiscal position of 5,707 designers (product, fashion, interiors and graphic designers) referring to year 2011, and it describes the typology and principal characteristics of the services they offered, their clients and markets, organizational forms and working places. The more interesting data concerns the category "*Design studios selling self produced artefacts*" (i.e. Indie Designers) which presence is not substantial in terms of absolute numbers (it represents 3.4% of the sample) but it certainly exceeds the number of large dimension design studios. Self-producers' features can be highlighted as follows:

- They present a diversified clientele composed by singular enterprises, private organizations and private subjects;
- 1/3 of designers realize 43% of their income with foreign clients presenting a notable level of internationalization;
- their productive activities have a micro dimension, 61% of self producers consists of individual enterprises relying on 1-2 workers; just on 20% of cases there are employees;
- 97% of designers are autonomous workers working independently;
- their prototyping/production space has a considerable importance. The overall working surface consists of 68 square meters, for 51% of the sample 48 square meters are set up as laboratory for prototyping and production.

In 2012, before the *Makers' Inquiry*, a non scientific analysis called *Designers' Inquiry* was developed in order to investigate the working condition of designers, focusing particularly on their precarious condition (Cantiere per pratiche non-affermative, 2013). Conducted on a sample of 767 designers aged between 21 and 35 years old (96% of them were Italian), the survey highlighted some particular aspects on their economic condition: younger designers have very few earning with irregular incomes (32% affirms to gain from 0 to 5,000 € per year and 40% between 5,000 and 20,000 €), 33% of them needs to have a second complementary job in order to integrate his income, there is a lack of tutelage for designers and, in general, there is a need to develop a network of contacts in order to obtain some collaborations.

Some common founding between the results of the *Makers' Inquiry* and the *Designers' Inquiry* refer to the following aspects:

- the relationship with a diversified market composed by both B2B and B2C channels;
- a working and contractual condition based on self-entrepreneurial activity;

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[8] Identified by the Cod. ATECO 74.10.10

[9] Identified by the Cod. ATECO 74.10.90

- the need to develop integrative earnings (design or making can be considered both the first or second activity together with something else);
- the direct link between the working condition and the presence of places (private or public) accessible for prototyping artifacts or experimenting with technologies;
- the interest in having other places (like Maker laboratories) able to complete the own personal workshops or private production space;
- an activity strongly focused on the development of relation networks and contacts in order to start generating commissions;
- a strong continuity and proximity between personal and professional life;
- the importance of familiar and friends network in supporting the creation and development of their market;
- an activity developed thanks to strong personal motivation enabling to face also unfavorable working conditions.

It should be noted, however, that the *Designers 'Inquiry* does not mention Peer Production and the importance of collaborative communities while competition and the competitiveness of designers is well described.

On the second side, an interesting source for comparison comes from the first report on digital technology impact on Italian manufacturing system, realized by Fondazione Nord Est and Prometeia for the Make in Italy CDB Foundation on a sample of 1,000 Italian enterprises. This report describes the "*Make in Italy*" as the transformation of the "*Made in Italy*" during the spread of the Makers Movement under the influence of digital fabrication technologies (Fondazione Nord Est & Prometeia, 2015). The report depicts Makers as "*a still very fragmented world, very magmatic, with great innovative capabilities and high possibilities of transferring its innovations to more structured enterprises*" (p. 11). The study suggests that digital fabrication technologies and Makers can foster innovation and the valorization of human capital by developing advanced technology profiles, by introducing innovative elements in traditional enterprises and by reinforcing the competitive capabilities of the entrepreneurial system. The report talks about Makers only in the introduction, mainly referring to the theme of digital craftsmanship, i.e. the forms of manufacturing production characterized by the use of digital technologies. There is no specific reference to the working condition of Makers or to Peer Production. Therefore some of the thematic at the basis of Maker culture have not been faced in this analysis of digital technologies influence within tradition manufacturing enterprises.

An important section of the report describes the adoption of digital fabrication technologies also focusing in the factors preventing or slowing the technology diffusion like 3d printing. It is interesting to highlight how finding professionally trained workers able to develop the use of these technologies (as Makers could be) is not perceived as an important problem from the enterprises. A further confirmation of the actual distance between Makers (and their values) and enterprises can be noticed in another section of the report: the one describing the actors the enterprises deal with in order to obtain information and updates on digital technology development. Also in this case Makers as individuals or communities of professionals and workers are not even contemplated. The theme of the Maker community is represented regarding the relationship between manufacturing enterprises and Maker laboratories which, however, turns out to be very weak at all levels: Makers and Maker

laboratories are considered the less relevant actors when it comes to talk about technology. This fact could be analyzed in different ways, first of all the recent development of Maker movement and the scarce number of Maker laboratories compared to enterprises. The final section of the report has a specific focus on the role of Maker laboratories and defines two different strategy of development: on one side such laboratories could become stable partners for enterprises; on the other side these laboratories could work on education and on the spreading of digital manufacturing within enterprises and the civil sector. In the first category professional Makers operating as collaborators/ business partners would prevail while in the second one Makers operating as volunteers would prevail.

In conclusion, it can be highlighted many common areas and similarities between makers and designer working condition emerge while the parallel between Fab Labs, Makerspaces and enterprises remains still residual. In particular, comparing the *Makers' Inquiry* and the report realized by Fondazione Nord Est and Prometeia, the following notable elements can be considered:
- the partners of manufacturing enterprises are not Makers meant as individual workers/professionals but Maker laboratories meant as organizations containing those communities;
- within the industrial context, Makers do not seem to be considered as professional profiles by enterprises for the development and the use of digital technologies;
- the relationship between manufacturing enterprises and Peer Production, ideally represented by Maker laboratories, presents a residual and scarce value. The relationship between communities of professional Makers and enterprises do not take into consideration Peer Production: instead it focuses on consulting services, while the peer-to-peer dimension seem to be more connected with the field of education/learning where voluntary work prevails.

5. Policies for facilitating the work dimension in the Maker community

Since the early twenty-first century digital manufacturing has been influencing models of production and also the possible changes in working conditions. For these reasons, this issue is at the heart of political agendas and in many policy documents and policy initiatives of the most advanced economies[10]. This section of the article analyzes a range of these reports in order to to track and classify the presence of policy initiatives that frame and support in many ways Makers and Peer Production. This is an initial and exploratory literature review work that should be implemented in a systematic way in the future, but that for the moment helps contextualizing the data of the *Makers' Inquiry*.
At global level, there seems not to be any policy recommendations dealing with these topics. For example, the agenda entitled "*The Future of Manufacturing: Driving Capabilities, Enabling Investments*" developed by UNIDO and the World Economic Forum does not speak of the Makers, Maker laboratories and Peer Production as elements able to influence the future of manufacturing (Rodrigue, Farra, Ni, Ferraz, & Alcorta, 2014).
To date, at European level, no laws or regulations recognize Makers like subjects/actors to which allocate specific initiatives and resources. Within the European Union, there is a very small number of

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[10] Recently, many consultancy companies like BCG, Deloitte, PWC, Mc Kinsey have developed many reports regarding the impact of new technologies in manufacturing and therefore businesses and the economy.

reports and policy documents which deal specifically with the role of Maker, Maker laboratories and Peer Production. For example, the report "*Design for Growth and Prosperity*" was the first to promote Open Design (while at the same time also promoting more closed regimes for IP) as part of the transformation of designers in producers (Thomson & Koskinen, 2012)**.** The recent policy paper "*Making Good our Future Exploring the boundaries of New Open & Social Innovation in Manufacturing*" (Johar, Lipparini, & Addarii, 2015), produced by Social Innovation Europe, coins the term "*Maker Manufacturing*" to describe a model of production (wider than the Makers Movement) strongly influenced by the dynamics of social innovation and inspired by the principles of open source. The report also talks about "*new strategies for industrialization and growth which engage all citizens.*" Final recommendations invite the European Union to invest resources in new infrastructure, ranging from the new marketplaces to the facilities such as Maker laboratories that can support Makers to develop technical, technological and entrepreneurial skills.

On the contrary, the documents prepared by the European Union Commission or Parliament, which are directly related to the future of manufacturing (e.g. Factories of the Future and Industry 4.0) (Davies, 2015; EFFRA, 2013) never mention the terms Makers, Maker laboratories and Peer Production. This is indicative of a possible recurring pattern in which "*making*" has more influence in the world of design and social innovation rather than in the field of Industry and technological innovation.

In Italy, policy and innovation initiatives are mainly concentrated at local and regional level; they are characterized by the following interventions promoted by public entities:

- initiatives for the creation/enhancement of Maker laboratories in urban and regional contexts (e.g. City of Milan, Lombardia and Veneto[11]). These actions focus on Maker laboratories as reference subjects in order to attract and aggregate the community of Makers for stimulating forms of Peer Production;
- Initiatives that encourage the clustering and territorial networking of qualified Maker laboratories in order to increase skills and job opportunities for Makers (focusing on knowledge sharing);
- Initiatives funding the use of Maker laboratories for public policies aims to stimulate the employability of young people through the development of new capabilities[12];
- Initiatives and programs funding the creation of open innovation ecosystems where professionals, companies and universities develop collaborative platforms to implement innovative products and services[13].

UK initiatives for the Makers Movement are now developing very strongly but lags behind other countries such as Spain, France and Italy. This is (perhaps) due to the fact that much of the British political agenda was first focused on two issues: 1) how to reconnect the manufacturing to a service economy; 2) how to harness the potential of digital manufacturing technologies to reinvigorate the

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[11] The open call related to this initiative http://www.comune.milano.it/dseserver/webcity/garecontratti.nsf/WEBAll/CC35E99B9F78A0ADC1257DF200314A94?opendocument describes the Makerspaces as *"open and common labs where makers meet to share knowledge and resources in order to make stuff"* (p.1) and the Fab Labs as places *"characterized by a continuous knowledge exchange and thanks to the use of new technologies and open source software and hardware it is possible to make stuff"* (p.2).

[12] The City of Milan is using Maker laboratories in order to promote educational activities for unemployed young people (NEETs) with the aim to activate or re-generate technical and entrepreneurial capabilities.

[13] The Italian Ministry for Economic Development funds initiatives to create centers for the development of open source hardware and software in order to support the knowledge transfer to schools, citizens, craftsmen and microenterprises.

Made in UK (Sissons, 2011; Sissons & Thompson, 2012; The Government Office for Science, 2013). After the first Manufacturing Institute initiatives and educational campaigns in 2012, the terms Makers and Fab Labs appear in innovation initiatives in 2015, when NESTA created an open map of British makerspaces and Fab Labs (Sleigh, Stewart, & Stokes, 2015). NESTA considered them as places of civic and social innovation that can increase the potential for "*design, entrepreneurship, fabrication, manufacturing, and technological innovation*" (p.1). Another specific initiative by NESTA - called Digital Makers Fund[14] - encourages young people to develop innovative products combining design and technology.

In Spain, as in Italy, there are regional/municipal policies aim to build regional networks of Maker laboratories. One of the most interesting and ambitious project is FabCity project[15] (Diez, 2014; Menichinelli, 2013b); started in Barcelona and extended to many other cities around the world, it is a replicable municipal policy with an online platform that aims to develop a productive urban context where citizens share their knowledge to solve local problems and develop new business models and training/education within a network of urban Fab Labs. Germany, which is a leader of the policy initiatives on programs such as Factories of the Future and Industry 4.0, in reports on the Future of Manufacturing (Kagermann, Wahlster, & Helbig, 2013) developed by the Ministry of Research or Fraunhofer Institut never mentions Makers and Maker laboratories. The Fraunhofer Institute organized initiatives on "innovative citizens" financed by the Ministry of Family, Youth, Culture and Sport involving Fab Labs. This confirms once again the lack of strategic links between the world of the Making, Peer Production and Industry (Germany has less Makerspaces than other big European Countries).

The USA is the country where the Maker Movement and the Maker laboratories originated, thanks to several cultural and entrepreneurial initiatives. For this reason, several policies have been proposed: from establishing at least one Fab Lab per every 700,000 individual to establishing a national network of manufacturing institutes (Menichinelli, 2013a, 2013b). Other public initiatives try to stimulate new entrepreneurs through Makers (Makers as new techno-entrepreneurs) and for Makers (Makers as a potential market for technology and service providers, such as TechShop). This is a central item on American politics and goes in the direction of creating an Economy of Making (represented under the slogan "*A Nation of Makers*"[16]) where the Maker Movement has points in contact with the world of industrial production, with the world of education and research, and with the issues of social innovation. Many legislative actions and policies promoted by the US Government go in the same direction: for example, funding for research on digital manufacturing led to the birth of Fab Labs (MIT News, 2001).

6. Conclusions

We investigated the knowledge, values and working dimensions of Makers in Italy with the *Makers' Inquiry*, a survey that focused on Makers, Independent Designers and managers of Maker laboratories. This research generated a first overview of the phenomenon in Italy, identifying the profiles of such

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[14] The official website for the Digital Makers Fund initiative can be accessed here: http://www.nesta.org.uk/project/digital-makers

[15] The official platform for the Fab City project can be accessed at http://fab.city/

[16] The page regarding this initiative can be accessed here: https://www.whitehouse.gov/nation-of-makers

Makers; this is an important step because Makers are usually defined in a very broad way. Furthermore, we investigated their profiles regarding their values and motivations, in order to understand how much Makers engage in Peer Production or in traditional businesses, whether they work with open source and collaborative processes or individually, whether their communities have a strong role in their work or they are just a dimension with limited relevance. We then investigated their emerging business and working condition. Finally, we compared these profiles with data regarding traditional designers and businesses, and we gathered a first analysis of policies regarding Makers, Maker laboratories and their work in order to understand the strategic context where Makers could work in the future.

Far from happening in a void and being a completely unexpected revolution, Italian Makers have a strong relationship with their localities and established industry. Therefore, this is a recent evolution, where Makers work with a broader palette of projects and strategies: with both non-commercial and commercial activities, both Peer Production and traditional approaches. The activity of making is still a secondary working activity that partially covers the Makers' income, who are mostly self-employed working at home, in a craft workshop or in a Fab Lab in self-funded or non-commercial initiatives, where technology is not the only critical issue. After analyzing the data from the *Makers' Inquiry*, we can affirm that Italian Makers have an interest towards collaboration and Peer Production and, in particular, the will to collaborate is mostly deriving from the necessity of technological skills and capabilities acquisition but it is also an issue that is informally considered important. A notable interest towards openness is also present but we could not find any useful information which could have helped us differentiating the Maker approach to openness when it comes to digital (i.e. open software) and physical (i.e. open hardware) content. Italian Makers associate making to a lower level with openness, but the practice has a stronger relationships with openness than the association of keywords with the term '*Making*'. Participation in communities is relevant, but there is more collaboration in Maker laboratories than in online communities. Italian Makers do practice Open Design, but the gathered data suggests that Peer Production for physical goods in the context of Makers is still limited (in approach and scale of production), at an early stage, more linked to practice than ideology. As found in the existing literature about Peer Production with physical goods, there is a need for more practice and research in order to close the gap with Peer Production with digital content.

The working conditions of Italian Makers is emergent and still not completely sustainable: there is more interest in work than in hobby; the age of Makers falls in the working-age range and they mostly consider making a work (even if only a part of their income comes from making and making is mostly a secondary activity). Comparing the *Makers' Inquiry* with other national reports, we could notice how institutions are mainly interested in making activities within a particular dimension connected to the development of organizations and spaces such as Maker laboratories. Institutions believe that these spaces could be useful for the convergence of various profiles of Makers (professionals, students, volunteers and citizens) where they can interact among themselves and also with enterprises and other coworking spaces. The profile of Makers in Italy however is still not recognized as a specific working or professional figure to whom address particular policies. Therefore Makers do not play an institutional recognisable role and neither Makers organizations are protected or considered by government policy in terms of communities. On the opposite, Maker laboratories could probably be addressed as the closest actors able to represent their rights and necessities. The connection between the Maker

movement and the tradition world of production seems to be weaker. In this context both Makers as individuals and Maker laboratories as community places have a marginal role without a real tangible and operational network. Supporting this consideration, it has been presented how Italian institutions are mainly interested in funding particular initiatives aimed at creating infrastructures to be put into a wider network while just a minimum amount of organizations and initiatives deal with teaching and educational activities. In doing so, institutions do not directly support the real professional work of Makers, concentrating their activities just within the proliferation of Maker laboratories.

Generally, no national initiatives focusing on Maker's identity, role and professionalism seem to emerge. Indeed most of the policies seem to be principally focused on the development of spatial infrastructures and networks or they are linked to the context of Social Innovation. Italy and Germany, the biggest manufacturing nations in Europe, have in common an apparent lack of connection between the world of making and the world of traditional manufacturing. The situation appears different in the USA, where more advanced and established initiatives exist: the national culture, strongly oriented towards self-empowering, generated a different perspective for Makers as the new entrepreneurs. Generally, Peer Production is almost absent from policies: it is mentioned only regarding Design or Social Innovation policies and separated from manufacturing. The social dimension of Makers could be also more present in policies: most of Makers are male, and policies could try to improve this towards a working condition of gender balance.

The data gathered shows some interesting information, that could be however, strictly applicable to an Italian context. Nevertheless, the survey could be a starting point to compare the same phenomenon in different countries. Therefore, on makersinquiry.org we released the survey files, software and data as open source in order to facilitate the adoption, modification, verification and replication of the survey. Furthermore, the replication of such survey in more countries could both lead to an improvement to the survey, tools and approach and a further example of Peer Production, in the context of Design research. The connections among Makers, Maker laboratories, Peer Production and work are growing, but further research is needed on the topics of Peer Production with physical goods and on the topic of policies that can make the work condition of Makers more sustainable.

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