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**The FabLab Amsterdam users:**  
a survey on their profile and activity.

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## **ABOUT THIS REPORT**

This report presents the findings of a survey distributed among the FabLab Amsterdam users during the month of November 2012. The survey was hosted online and counted with 190 full responses from the community.

This study has been developed within a broader research project called “Object-user relationships in *open design* dynamics”, a 9-months collaboration of the VU University Amsterdam and Waag Society within the program ‘Embedded Researchers in the Creative Industry’, promoted by the Vrije Universiteit and the Universiteit van Amsterdam (September 15 2012- June 15 2013). In this context, the main purpose of the survey was to select relevant users of the FabLab Amsterdam and later examine their attachment to objects created through participatory design and self-manufacturing. That aside, this document makes the outcomes of the survey public to encourage further analyses of its results.

## **THE FABLAB AMSTERDAM**

The FabLab Amsterdam was established in 2007 by Waag Society, institute for art, science and technology. It was first located in Parkhuis de Zwijger and in June 2010 it moved to Nieuwmarkt, in the oldest secular building of Amsterdam, where it functions until today.<sup>1</sup>

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<sup>1</sup> A. Schaub, interview with the author, Amsterdam, 20 November 2011.



Fig. 1. Interior of the FabLab Amsterdam



Fig. 2. Exterior of the FabLab Amsterdam

In 2007 Waag Society was participating in the board of Fablab.nl, a group promoting the FabLab concept in the Netherlands. In parallel, Waag Society was turning from a lab working on the internet to a lab working much more on physical products and prototyping. The concept of the FabLab was very much in the line of Waag Society's vision of making technology accessible, so these motivations were combined to set up their own prototyping laboratory and open it as a FabLab.<sup>2</sup>

FabLabs are workshops of digital fabrication, according to their initiator "*FabLab* can mean a lab for fabrication or simply a fabulous laboratory".<sup>3</sup> The first FabLab was created in the context of the Center for Bits and Atoms (CBA), headed by Prof. Dr. Neil Gershenfeld of the Massachusetts Institute of Technology (MIT), as a means to study the computational capacities that are inherent to physical systems. "The CBA has supported the setting up abroad of a small number of similar Fab Labs, to be able to do further research into the effects and possibilities of making accessible the computational capabilities of the physical layer. The Fab Lab concept quickly became popular among users outside the research domain, and an international network of similar Fab Labs came into being".<sup>4</sup> Nowadays (November 2012) there are around 150 FabLabs worldwide and 9 in the Netherlands.<sup>5</sup> The FabLab Amsterdam has a particular reputation in the worldwide community, positioned as a working space more related to art and design than to technology and engineering, a profile closer to other FabLabs. Amsterdam and Barcelona have served as examples to other innovation centers being set up around the globe.<sup>6</sup>

Nowadays, the space in Nieuwmarkt counts with the following equipment for prototyping and digital fabrication:

Laser cutter

Big milling machine

Small milling machine

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<sup>2</sup> B. Van Abel, interview with the author, Amsterdam, 21 November 2011; A. Schaub, interview with the author, Amsterdam, 20 November 2011.

<sup>3</sup> N. Gershenfeld, *Fab. The Coming Revolution on Your Desktop - From Personal Computers to Personal Fabrication*, New York (Basic Books) 2005, p. 12.

<sup>4</sup> Website of the International FabLab association: < <http://fablabinternational.org/fab-lab/where-does-it-come-from> > [16 November 2012]

<sup>5</sup> <<http://wiki.fablab.is/wiki/Portal:Labs>> [16 November 2012]

<sup>6</sup> A. Schaub, interview with the author, Amsterdam, 20 November 2011.

3D printer  
Vinyl cutter  
Embroidery machine  
Molding and casting station  
Electronic workspace<sup>7</sup>

The laser cutter is the most popular equipment, followed by the big milling machine; they often have to be booked months before being used. Other facilities like the electronic workspace or molding and casting station are used spontaneously and don't require reservation.<sup>8</sup>

The facilities are open to the public from Monday to Friday (10:00 -18:00), Tuesdays and Thursdays are the 'open days', when the space can be used free of charge. Reservation is required and can be done through the FabLab website (<http://fablab.waag.org/>); however, a lot of users come spontaneously to make use of the available facilities at the moment. Mondays, Wednesdays and Fridays are to be used by Waag Society's projects or organizations/individuals willing to pay for the use of the equipment. They may choose to use the facilities these days based on immediate availability (open days are generally booked in advance) or for profit-driven use of the lab. Besides the manager of the lab, its staff is based on interns and volunteers. Interns are generally international students willing to learn about digital fabrication.<sup>9</sup> They assist users in their projects and help in the organization of the lab.

Having introduced its facilities or working dynamics, it is important to note that this report focuses on the characteristics of the FabLab community. The following sections give an account of the methodology and outcomes of a consultation distributed among its members in November 2012.

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<sup>7</sup> Website of the FabLab Amsterdam <<http://fablab.waag.org/machines>> [21 November 2012]  
A. Schaub, interview with the author, Amsterdam, 20 November 2011.

<sup>8</sup> Ibidem.

<sup>9</sup> Ibidem.

## METHOD

The survey presented here aimed to collect general information about the FabLab users and the outcomes of their work. Considering the international and technologically oriented characteristics of the FabLab the survey was written in English, it was hosted online and its distribution was internet-based as well. Invitations to participate were placed in the *home* of the FabLab website, on the *wall* of the FabLab's *facebook* and sent by e-mail to all members of the community. Their e-mails were collected from the profiles in the FabLab website: a profile is needed to reserve the use of machines or make the results of one's work public.<sup>10</sup> Invitations were sent from the e-mail address of the FabLab manager; they included an estimation of the time needed to fill in all the questions (less than five minutes) and announced the possibility of winning one day of work at the FabLab to all respondents finishing the survey. We received 190 completed responses. An introduction to the survey in its first page included the institutional context of the research and the objectives of the consultation, which consisted in 12 compulsory and 8 optional/dependent questions that can be found in Appendix 1.

The questions were organized in three sections named: 'your profile', 'your activity in the FabLab' and 'results', combining closed questions with pre-selected answers and a few open questions. The second and third section allowed simultaneous multiple answers; therefore results expressed in percentage values are not necessarily complementary. Another reservation has to be considered while analyzing these results: the online survey was directed to FabLab users; however at least 24 respondents hadn't used its facilities, they had rather visited the FabLab with other purposes or were only part of its online community (see Appendix 2, question 7.a).

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<sup>10</sup> There were around 1500 profiles at the end of October 2012. However, some individuals had more than one profile and several profiles were automatically generated or fake. Therefore, it was impossible to determine the real amount of members in the community.

## RESULTS

Based on the results of this survey we can conclude that users are mainly young adults; age distribution is represented in Fig 3. Responses in terms of gender show a slight majority of male users; however, 42% of females can be considered a high rate in the context of use of technology and digital fabrication (Fig. 4).<sup>11</sup> This relationship changes among visitors who have worked more than five times in the lab; two thirds of them are males. Most of those who consider themselves expert users in digital fabrication are also men (9 from 10 expert users).

The professional background of respondents may be surprising for supporters of FabLabs as platforms turning *consumers* into *makers*.<sup>12</sup> 54% mentioned 'design' or 'designer' among the key words defining their professional background; 22% mentioned 'art/artist', 11% mentioned 'architect/ure' and 8% 'engineer/ing'. Only 12% of respondents (23 individuals) don't seem to be professionally related to digital fabrication, or at least are not linked to art/design/IT (Fig. 5). Manager, administrator, therapist, chauffeur and banker are some of the professions mentioned by them.

Within the art and design community, several users seem not to be restricted to traditional specializations (product/graphic/fashion design, visual/performing arts, etc); they rather used generic or several terms to describe their profession and areas of activity (see Appendix 2, question 4). The characteristics of the running projects in the FabLab suggest that digital fabrication tools are blurring the boundaries between hard/soft, 2D/3D, low tech/high tech production, and contributing to this generic professional approach.

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<sup>11</sup> A DIY community survey published in 2012, for example, indicates a response of 82,6% males and 17,4% females <<http://surveys.peerproduction.net/2012/07/mapping-hackers-diy-community-survey-2012-results/2/>> [22 January 2013]

<sup>12</sup> See for example, the beautiful video *Full Printed* <<http://vimeo.com/12768578>> [16 November 2012]

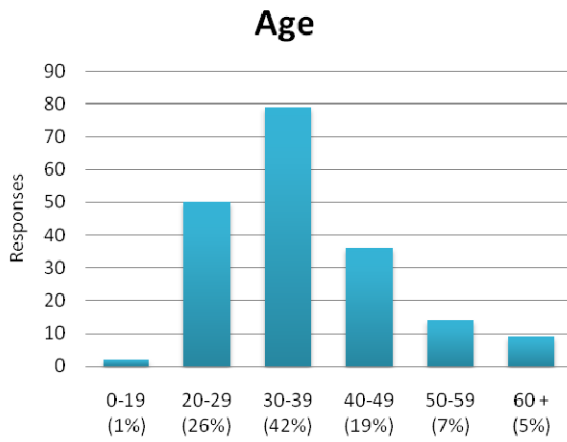


Fig. 3. Age of respondents.

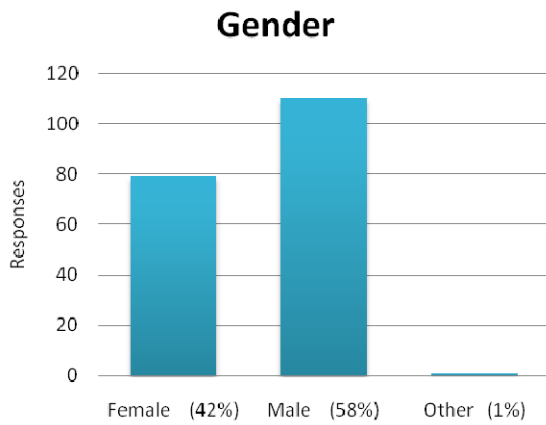


Fig. 4. Gender of respondents.

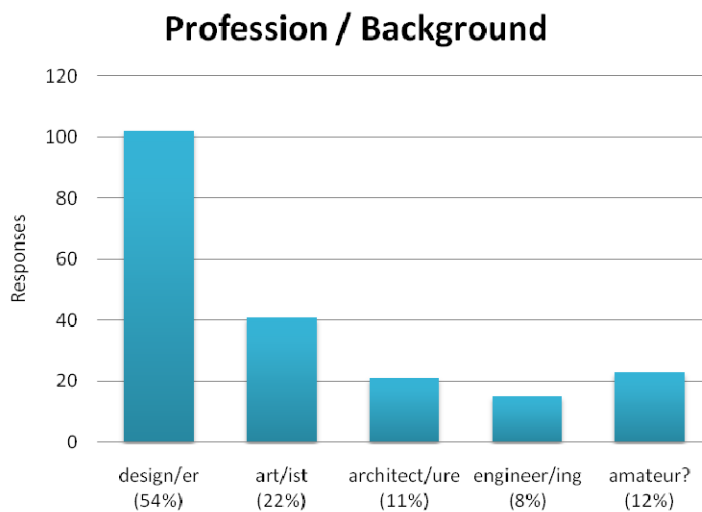


Fig. 5. Background / Areas of activity of respondents. Note: the content of this graphic is based on the analysis of descriptive data. See Appendix 2 for raw data.



The great majority of participants are users of the FabLab (84%), while 5% consider themselves expert users in digital fabrication. The FabLab functions based on the work of interns and volunteers, which summed 7% of respondents (Fig. 6). As fig. 7 shows, most of respondents have been occasional visitors; 62% have worked from 1 to 3 times in the lab. Their main reason to attend has been to work for a particular project (75%), followed by the interest of learning about digital fabrication (Fig. 8). Open days have been significant to provide access to users: 83% have used the lab during that period, while 27% have been there in reserved (paid) days (Fig. 9). Respondents were also asked how they knew about the FabLab Amsterdam; answers point out that informal communication with peers has been of great importance (Fig. 10). This may explain the art/design profile of users presented in Fig. 5 and discussed above.

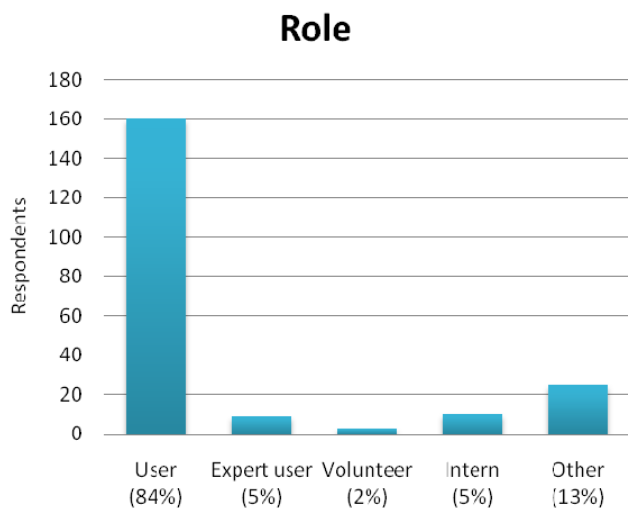


Fig. 6. Role of respondents in the FabLab Amsterdam

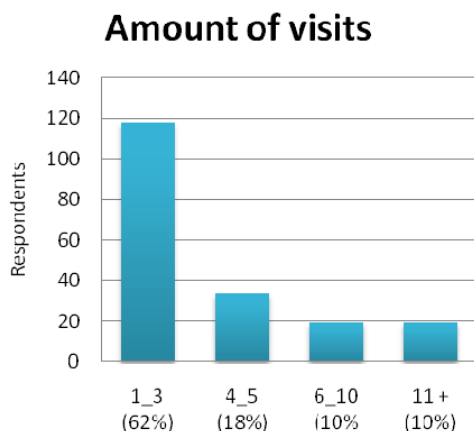


Fig. 7. Visits of respondents to the FabLab.

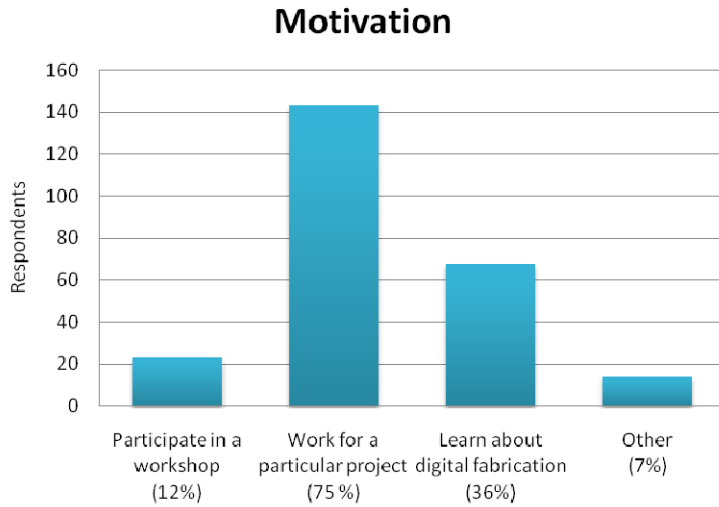


Fig. 8. Motivation to use the lab.

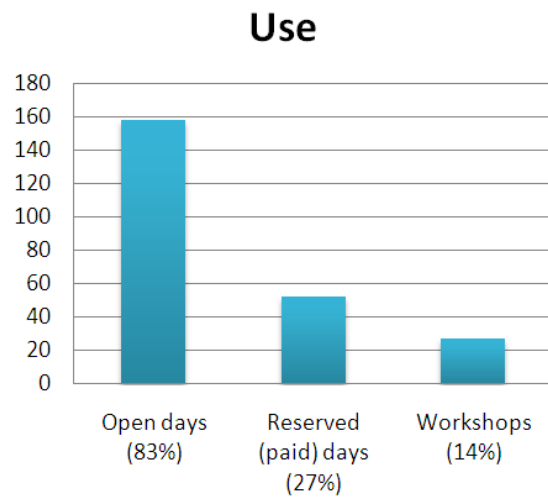


Fig. 9. When have users worked?

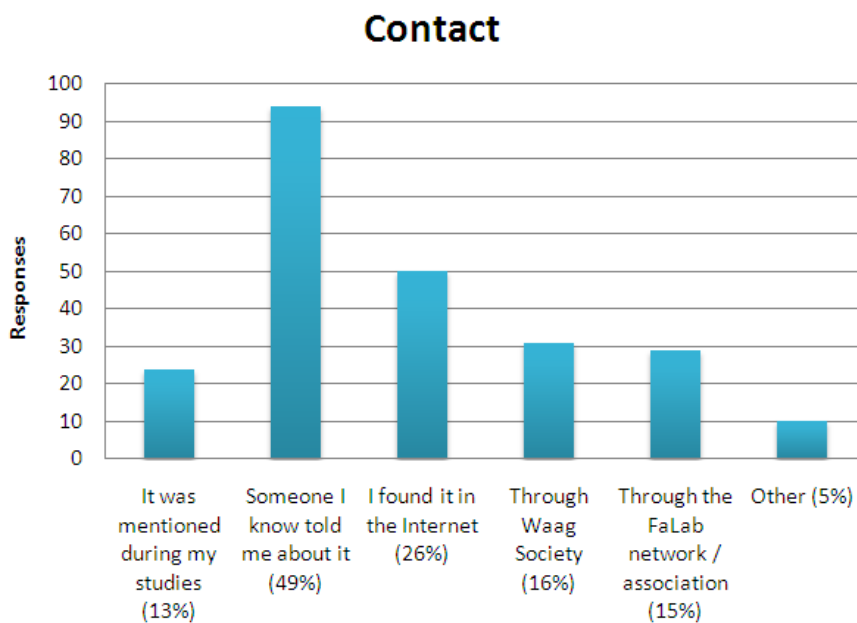


Fig. 10. How did users know about the FabLab Amsterdam?

This study throws some light on the circuit of design and creation of objects as well. The data imply that most of the users of the lab are both creators and manufactures of their objects, and that co-creation of blueprints is not significant among FabLab Amsterdam users (Fig. 11). This finding can be influenced by the possible answers provided for this question, which could have led respondents adapting blueprints created by others (or co-created blueprints) to choose the option “created by you” rather than “created by someone you know” or “created by someone you don’t know”. However, the option “other” was provided for these cases, selected by 13% of respondents. Clarification for this option was required and only two respondents mentioned collaborative processes.<sup>13</sup> That aside, 25% of respondents used blueprints done by others during their work at the lab (either blueprints provided by the FabLab, blueprints done by someone they know or someone they don’t know); suggesting that collaboration within the FabLab community is a frequent phenomenon.

The main outcome of users’ work at the lab are functional or decorative objects (59%) although 31% of respondents created pieces of art and 25% mock ups (Fig. 12). This relation changes among expert users, who have produced pieces of art, objects and mock ups in a similar proportion (6, 5 and 5 responses respectively). In any case, the purposes of objects are as much experimental as functional (Fig. 13). Moreover, a lot of them are considered prototypes or try-outs by their creators.

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<sup>13</sup> These two members mentioned ‘we build the ideas together and then Fablab makes it into reality’ and ‘both via open sources online and ‘inverted’ by workshops participants’.

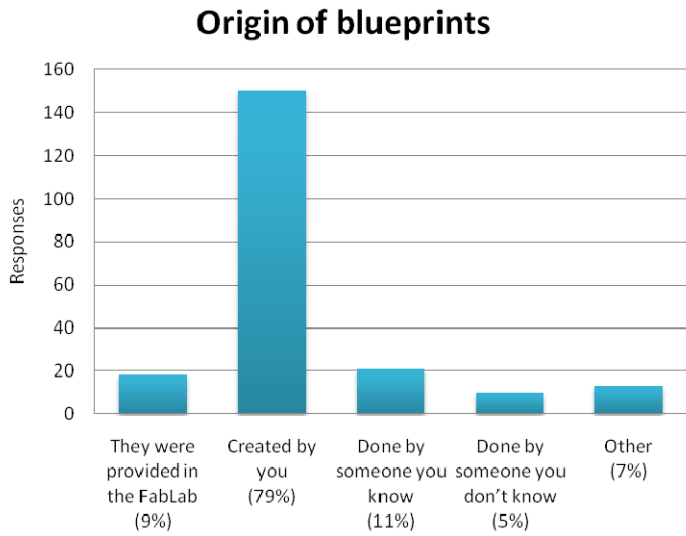


Fig. 11. Origin of the blueprints used

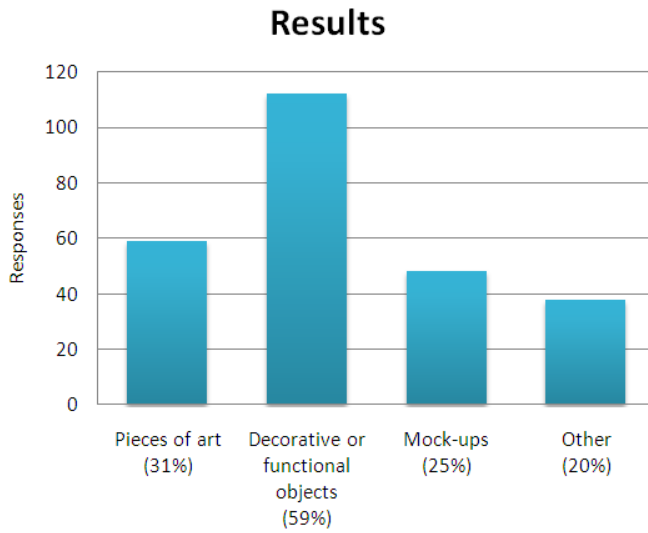


Fig. 12. Results

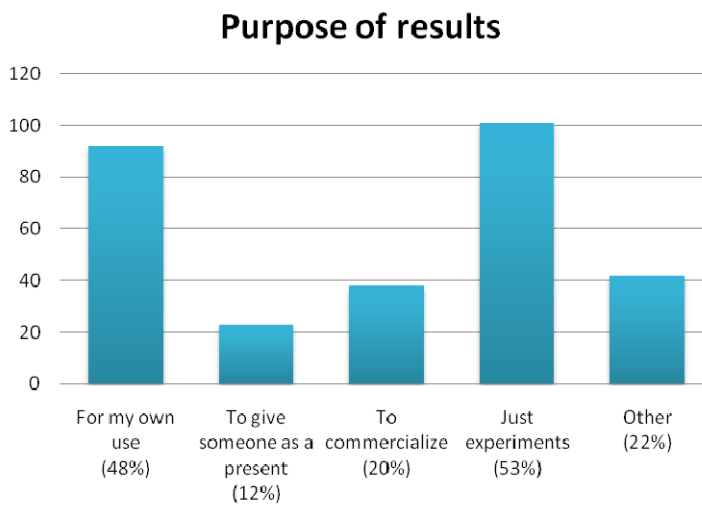


Fig. 13. Purpose of the resultant pieces

## ANALYSIS

As stated in the introduction of this report, the aim of this document is to provide raw data and encourage further analyses on the use of the FabLab (see Appendix 2). However, a brief examination of the information gathered is presented below.

The data collected in this survey indicates that the users of the FabLab Amsterdam are mostly creative professionals interested in experimenting with digital fabrication. Members seem to be aware of its profile, they state that 'FabLab is very important for designers and artists' and 'it is fantastic that the FabLab can be used for experimenting'. The *open days* make that possible, especially considering that visits to the lab are for them one more activity of the creative process and only sometimes a final step for materializing their ideas. Assistance from FabLab staff is highly needed and appreciated for the same reason. Respondents mentioned their experience working with the FabLab staff more than with the equipment or other users of the lab. The majority of respondents were very satisfied with the working dynamics: 'I am very happy about the fablab and its open structure, it really stimulates the creative process and makes possible for me as a creative to develop fluently my ideas'; however, two of them seemed confused by their role in the working space:

'To me working at Fablab felt a bit awkward. What is my relation to the lab: guest, client, colleague? This made me a bit uncertain about what I could and could not do. I think this is because Fablab introduces a new kind of work-relation. I wonder if it would be interesting to focus on developing that feel more explicitly... maybe it could enhance its functioning'.

Users seem to feel 'part' of this facility and its related community; 61% of the survey respondents expressed their interest in receiving the consultation results. The fact that the outcome is significant for the majority of FabLab users shows involvement with the profile of the lab. Many respondents used the open field in the consultation to express their enthusiastic opinion on the FabLab concept and facilities: 'I love the idea of having a fablab in the area, I think it supports innovation in a very accessible way', 'keep on going with fablab, it's great!', 'thank you for the opportunity to work in the FabLab!', etc. Judging by other comments, it

is evident that demand to use the facilities exceeds availability, especially for the laser cutter: 'only fragmented work is possible', 'even after phoning the FabLab, there was no way to finish the experiment I was working on'.

FabLabs in general have been linked to different phenomena. The data collected through this survey, combined with observation of daily activity in the lab and contact with some participants to clarify their responses, give us the opportunity to evaluate to what extent is the actual practice within the FabLab Amsterdam related to these associations:

**FabLabs as enhancers of innovation:**

FabLabs are perceived as centers for grassroots innovation and therefore many of them have been supported by local public funds.<sup>14</sup> Peer-production researcher Peter Troxler, for example, has claimed that within the FabLab community a private-collective innovation ecology is developing and distinguishes between 'labs providing production facilities' and 'labs providing innovation support'. He also notes that urban FabLabs in industrialized countries envisage their clientele to be distributed among students, researchers, companies and the general public and acknowledge their contribution in education, research, development and prototyping.<sup>15</sup>

The activity and profile of the FabLab Amsterdam are aligned with this vision, the lab is providing innovation support to its users in a number of ways: encouraging hands-on learning and experimenting, keeping examples of previous experiences to show to other users, facilitating connections with other relevant members of the local and international FabLab community and supervising the whole creative process if necessary, including the creation of blueprints. The FabLab charter makes clear that 'commercial activities can be prototyped and incubated in a FabLab, but they must not conflict with other uses, they should grow beyond rather than within the lab, and they are expected to benefit the inventors, labs, and

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<sup>14</sup> P. Troxler, *Common-based peer-production of physical goods: is there room for a hybrid innovation ecology?*, in 3<sup>rd</sup> Free Culture Research Conference, Berlin, 2010, p. 7.

<sup>15</sup> P. Troxler, op. cit. (note 14), pp. 8-9.

networks that contribute to their success'.<sup>16</sup> The FabLab Amsterdam is in fact supporting these activities and promoting the development of the small scale creative industry in the local context.

### **FabLabs as platforms for co-creation and open design:**

Together with domestic tools for digital fabrication, FabLabs have been considered the platform through which the virtual processes of open design becomes physical.<sup>17</sup> Co-design researcher Massimo Menichinelli has claimed that '(t)he main importance of Fab Labs (and hackerspaces and so on) is that they are enablers of Open and Collaborative projects'.<sup>18</sup> The FabLab charter states that 'designs and processes developed in FabLabs can be protected and sold however an inventor chooses, but should remain available for individuals to use and learn from'.<sup>19</sup> In fact, the staff of the FabLab Amsterdam encourages users to publish the failures and successes of their work online and to share the blueprints used, so that others can re-use or adapt them according to their own needs. However, users often fail to share the results of their work online and Fig. 11 suggests that the great majority of the creative processes are individual.

Collaborative creative processes don't seem a common practice within the FabLab Amsterdam, presumably because of the profile of its users. Professional artists and designers come to the FabLab with their own *original* ideas and want to put them in practice through digital fabrication.<sup>20</sup> Help and technical knowledge from other users concerning the use of machines is a daily practice and highly appreciated; however, this collaboration doesn't seem to be reflected in the creative process itself.

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<sup>16</sup> < <http://fab.cba.mit.edu/about/charter/> > [30 January 2013]

<sup>17</sup> See for example J. Thackara 'Into the open', p. 44 and M. Avital 'The generative bedrock of open design', p. 52, in: B. Van Abel, et al. (eds.), *Open Design Now, why design cannot remain exclusive*, Amsterdam (Creative Commons Netherlands, Premsela and Waag Society) 2011.

<sup>18</sup> M. Menichinelli, *Business models for Fab Labs*, posted in 23 March 2011, <<http://www.openp2pdesign.org/2011/fabbing/business-models-for-fab-labs/>> [30 January 2013]

<sup>19</sup> < <http://fab.cba.mit.edu/about/charter/> > [30 January 2013]

<sup>20</sup> Mushon Zer-Aviv has pointed out that designers and artists' focus in individual originality, in detriment of collaborative processes. M. Zer-Aviv, p. 72 in op. cit. (note 17).

**FabLabs as spaces for amateur DIY, following the principle of *users as designers*.**

In line with the concept of *open design* and domestic digital fabrication tools, FabLabs are seen as democratic spaces for amateur empowerment.<sup>21</sup> A clear example of this vision is the video Full Printed, a short animation film screened during the exhibition “Fabrication Laboratory” in the HUB Design Museum in Barcelona (2010).<sup>22</sup> In the video, a user decides to create his own personalized cup to replace his mass-produced broken one. With this purpose, he searches for a 3D blueprint created by another user on-line, adapts this design to his personal needs and transforms the result in a physical object in the nearest FabLab. Finally, the main character looks at his object with an expression of pride and personal achievement.

Within the FabLab Amsterdam, these kind of amateur DIY practices are possible; however, they are not (yet) usual. Some users are aware of this fact and consider that it should change: ‘the Fablab could be used by more people; it now looks like a workspace for (art) academies’. Others see the current situation as a necessary step towards a new scenario, where digital fabrication would give support to DIY amateur practices and *democratize manufacturing*: ‘keep the professionals as target group; too early for the consumer’. In fact, the professional community is curious and wants to learn and experiment with plenty of new possibilities that are offered by digital fabrication; the FabLab Amsterdam is providing a platform for this to happen. Meanwhile, the knowledge of creative professionals on these processes and their potential is growing, and technology is being improved to suit the needs of amateurs. Based on the present picture, a vision of the FabLab as a supportive platform for amateur DIY seems feasible; however, practice is still in a preliminary stage.

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<sup>21</sup> See for example M. Avital ‘The generative bedrock of open design’, p. 57; B. Pettis ‘Made in my backyard’, p. 79 and B. Mulder ‘Open design for government’, p. 181 in op. cit. (note 17).

<sup>22</sup> <<http://vimeo.com/12768578>> [16 November 2012]